

**ALTERNATIVE FUELS: CURRENT STATUS,
PROPOSALS FOR NEW STANDARDS,
AND RELATED INFRASTRUCTURE ISSUES**

HEARING
BEFORE THE
SUBCOMMITTEE ON ENERGY AND AIR QUALITY
OF THE
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COMMERCE
HOUSE OF REPRESENTATIVES
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ALTERNATIVE FUELS: CURRENT STATUS, PROPOSALS FOR NEW STANDARDS, AND RELATED INFRASTRUCTURE ISSUES

TUESDAY, MAY 8, 2007

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON ENERGY AND AIR QUALITY,
COMMITTEE ON ENERGY AND COMMERCE,
Washington, DC.

The subcommittee met, pursuant to call, at 10:00 a.m., in room 2123 of the Rayburn House Office Building, Hon. Rick Boucher (chairman) presiding.

Members present: Representatives Butterfield, Melancon, Barrow, Markey, Gonzalez, Inslee, Baldwin, Hooley, Matheson, Dingell, Hastert, Upton, Whitfield, Shimkus, Shadegg, Buyer, Bono, Walden, Rogers, Sullivan, Burgess, and Barton.

Also present: Representative Green.

Staff present: Bruce Harris, Lorie Schmidt, Laura Vaught, Chris Treanor, Jonathan Brater, Margaret Horn, C.H. Bud Albright, David McCarthy, Tom Hassenboehler, and Matthew Johnson.

OPENING STATEMENT OF HON. RICK BOUCHER, A REPRESENTATIVE IN CONGRESS FROM THE COMMONWEALTH OF VIRGINIA

Mr. BOUCHER. The subcommittee will come to order. This morning the Energy and Air Quality Subcommittee is turning its attention to alternative fuel. Increasingly, our Nation's energy independence is a goal which we all share and given that we currently import approximately 60 percent of the oil which we consume in the United States, it is appropriate and necessary that we explore and encourage all possible means of increasing the domestic production of fuels which will lessen our dependence on foreign sources of oil.

While corn-based ethanol is currently the primary alternative fuel produced in the United States, other biofuels, including cellulosic-based manufacturing for ethanol and biodiesel holds great promise for increasing the contribution of domestically produced fuel. Also promising is the potential of coal-to-liquids, regarding which we heard testimony at a previous hearing. Today our focus is on a broader range of alternatives to petroleum other than coal-to-liquids.

The Energy Policy Act of 2005 established a mandatory amount of renewable fuel that must be contained within the United States' gasoline supply. The amount of the mandate increases over time with 7.5 billion gallons required in the year 2012. For each year

after 2012, the Act requires that EPA determine, in consultation with the Secretaries of Energy and Agriculture, the mandatory renewable fuels volume amount with a minimum of 250 million gallons of renewable fuel to be derived from cellulosic biomass each year.

The program started last year with an interim rule. The EPA issued a final rule for the Renewable Fuel Standard on April 10, 2007, just about 1 month ago. The final rule included a mandate that 4 billion gallons of renewable fuels be used the first year, but actual production in that first year was almost 5 billion gallons. The Department of Energy projects that more than 11 billion gallons of renewable fuels will be used in 2012, a number well above the 7.5 billion gallons mandated by EPCA 2005.

Today's hearing we will explore recent proposals to change the Renewable Fuels Standard by increasing the amount of renewable fuels that would be required, expanding specific requirements for renewable fuels using cellulosic feedstock, broadening the mandate to cover other types of fuels and possibly changing the Renewable Fuels Standard to a low carbon standard. Increasing the amount and type of fuels mandated are the two primary components of the fuels portion of President Bush's proposed 2010 Initiative to reduce gasoline consumption by 20 percent by the year 2017.

The President's proposal would convert the Renewable Fuels Standard into an Alternative Fuels Standard, expanding both the volume of fuel to be produced and the type of fuels that would qualify. This proposal would require 35 billion gallons of alternative fuels by 2017; by most accounts, an aggressive target. One consideration for both current and future fuels mandates is the state of the renewable fuels infrastructure. Currently, all automakers warrant their vehicle engines to run on ethanol blends up to E-10. Automakers also produce flexible fuel vehicles that can accept ethanol blends of E-85.

There are more than 6 million flexible fuel vehicles on the road today and Ford, General Motors and the Chrysler Group have also pledged to double their annual production by 2010 and to make one-half of all vehicles that they manufacture biofuel capable by 2012. Although the number of flexible fuel vehicles has increased, the availability of E-85 at retail outlets has not increased accordingly. There is a wide range of estimates for the cost of converting existing infrastructure or installing new E-85 infrastructure at all service stations, with estimates ranging from \$5,000 to \$20,000 to convert existing equipment and from \$2,500 to \$75,000 to install new equipment, a very wide range of estimates.

The availability of the appropriate infrastructure is necessary for the wide scale deployment of alternative fuels, so an examination of the current status, as well as obstacles or opportunities surrounding the alternative fuels infrastructure is clearly appropriate for this morning. I look forward to hearing from our witnesses regarding the expansion of use of renewable and/or alternative fuels, as well as the related infrastructure issues.

And we will turn to testimony from our first panel momentarily. Before I do that, I am pleased to recognize other members for their opening statements and would note that any member who elects to waive an opening statement will have the time allotted for that

opening statement added to that member's question period for the first set of witnesses. I am not pleased to recognize the ranking member designate for today, my good friend, the gentleman from Michigan, Mr. Upton, for 5 minutes.

Mr. UPTON. Well, thank you, Mr. Chairman, and I am going to take the opportunity to defer and as I did not know I was going to be in this seat, Mr. Hastert is on his way, so I am going to ask unanimous consent that he may defer, as well.

Mr. BOUCHER. Without objection, so ordered.

Mr. UPTON. Thank you.

Mr. BOUCHER. And I thank the gentleman. The gentleman from Illinois, Mr. Shimkus, is recognized for 3 minutes.

Mr. SHIMKUS. I will also defer, Mr. Chairman.

Mr. BOUCHER. The gentleman defers his opening statement. The gentleman from Indiana, Mr. Buyer, is recognized for 3 minutes.

Mr. BUYER. I will defer.

Mr. BOUCHER. The gentleman defers. The gentleman from Oregon, Mr. Walden, is recognized.

Mr. WALDEN. Mr. Chairman, I, too, will defer.

Mr. BOUCHER. Mr. Walden defers. The gentleman from Oklahoma, Mr. Sullivan, is recognized for 3 minutes.

Mr. SULLIVAN. I will defer.

Mr. BOUCHER. The gentleman from Texas, Mr. Burgess, is recognized for 3 minutes.

Mr. BURGESS. Mr. Chairman, I will submit my statement for the record and save time for questions.

[The prepared statement of Mr. Burgess follows:]

PREPARED STATEMENT OF HON. MICHAEL C. BURGESS, A REPRESENTATIVE IN
CONGRESS FROM THE STATE OF TEXAS

Thank you, Mr. Chairman.

Mr. Chairman, this is probably one of the most crucial issues facing our country today.

I firmly believe that America's energy security should be this committee's top priority.

Home-grown fuels, such as biodiesel, cellulosic ethanol and coal-to-liquids, can help move the United States towards greater energy independence, and can even help to clean the environment.

As we begin work on energy independence legislation, I look forward to working with the chairman to include a provision that I'm working on which would incentivize clean diesel.

Diesel engines get an average of 30 percent greater fuel efficiency as gasoline engines, so putting more diesel cars on the road instead of a gasoline engine is like dramatically increasing the CAFE Standard.

Using biodiesel in those diesel engines can further reduce our demand for petroleum.

And, which this is not in our committee's jurisdiction, I hope that the energy independence legislative package will also include my bill H.R. 927, which would provide parity for biodiesel produced from recycled restaurant grease—something that we have in abundance in the Dallas-Fort Worth Metroplex.

There are numerous challenges to be met as we seek to increase our use of alternative transportation fuels—both in terms of technology, biology and chemistry, and in terms of supporting infrastructure. I appreciate our witnesses appearing before us today to discuss these issues.

Mr. Chairman, I yield back.

Mr. BOUCHER. The gentleman from Michigan, Mr. Rogers, is recognized for 3 minutes.

Mr. ROGERS. Mr. Chairman, I would defer.

Mr. BOUCHER. Well, the Republican side of the aisle gets a blue ribbon today for perfect consistent performance. The gentleman from Michigan, Mr. Dingell, the chairman of the full committee, is recognized for 5 minutes.

OPENING STATEMENT OF HON. JOHN D. DINGELL, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF MICHIGAN

Mr DINGELL. Mr. Chairman, thank you. I commend you for holding yet another important hearing regarding energy security and climate change. You have been showing extraordinary leadership in this matter and I think the committee has reason to be very grateful to you.

Today's examination of alternative fuels is particularly important to the committee's ongoing work on these important issues. Consumers deserve to have vehicles capable of operating on alternative fuels and to have these fuels readily available for their use. Ethanol has already helped clean the air as an additive to gasoline, 10 percent ethanol blended with 90 percent gasoline. It is not as an additive, however, that ethanol has its greatest potential. Its greatest contribution is improving national security and addressing climate change will be realized when low carbon ethanol is available at the marketplace as a true alternative, 85 percent ethanol blended with 15 percent gasoline, commonly known as E-85.

I look forward to hearing from our witnesses today what obstacles remain towards achieving this objective and what we can do to overcome it. In addition to E-85, other biofuels such as biodiesel, offer unique opportunities to improve efficiency and would consume less petroleum. Diesel fuel performs more efficiently than gasoline. These properties make diesel fuel excellent for heavy duty applications both on and off the road. Biodiesel expands upon diesel's natural efficiency by making a portion of it renewable. Additionally, biodiesel has fewer pollutants than traditional diesel fuel. Without a standardized fuel specification for biodiesel, engine and vehicle manufacturers have been reluctant to warrant their products when used with bigger concentrations of biofuel.

The potential benefits of biodiesel extend well beyond the light duty passengers cars and trucks. If biodiesel is standardized and widely available, it has significant potential to save petroleum and reduce emissions of carbon dioxide from freight, rail, maritime and other transportation sectors, which are often overlooked. Establishing a single national specification for biodiesel in concentrations of 20 percent and greater should be part of any package addressing these issues.

It is also wise to examine longstanding regulations of both fuels and vehicles in the context of alternative fuels. Government regulations should encourage alternatives to petroleum, not provide disincentives. For example, a corporate average fuel economy program regulates how efficiently a vehicle burns its fuel. It does not take into consideration, however, what fuel it is burning or the level of carbon dioxide it is emitting. Assuming our national objectives are to consume less petroleum and reduce greenhouse gas emissions, it is the efficiency with which a vehicle burns non-petroleum based fuel and emits few greenhouse gases. E-85 is less efficient than

gasoline, yet it displaces petroleum and can significantly reduce greenhouse gas emissions.

We must continue to ask these questions as we proceed with new legislation and review existing policies. Biofuels are considered in the context of energy security and climate change and it is important that we continue to examine how they can be made available to consumers true alternatives to petroleum. Anything short of that objective will fall short. Thank you, Mr. Chairman. I yield back the balance of my time.

Mr. BOUCHER. Thank you very much, Mr. Dingell. The gentleman from Massachusetts, Mr. Markey, is recognized for 3 minutes.

Mr. MARKEY. I will waive.

Mr. BOUCHER. The gentleman from Massachusetts waives. The gentleman from Texas, Mr. Gonzalez, is recognized for 3 minutes.

Mr. GONZALEZ. I will waive.

Mr. BOUCHER. The gentleman from Washington State, Mr. Inslee, is recognized for 3 minutes.

[No response]

Mr. BOUCHER. The gentlewoman from Oregon, Ms. Hooley, is recognized for 3 minutes.

OPENING STATEMENT OF HON. DARLENE HOOLEY, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF OREGON

Ms. HOOLEY. Thank you, Mr. Chairman I would like to welcome all our witnesses and thank you for being here today. I look forward to your testimony. I won't take up my full time, but I would just like to say a couple things regarding biofuels. While I am 100 percent supportive of the pursuit of development of biofuels, I would like to encourage my colleagues on this committee to not let it divert us from taking other steps to limit our dependence on foreign oil.

One of the most effective ways we can do this is through production of more fuel efficient vehicles. Biofuels, while worthy of pursuit, and certainly part of the solution, will not be a panacea. Biofuels need to be viewed as one piece of a bold strategy to begin to move our country toward our goal of energy independence. In the President's State of the Union address, he proposed his 2010 Initiative to reduce gasoline consumption by 20 percent by 2017.

He called for biofuels from ethanol made from wood chips and switchgrass to be practical and competitive within 6 years. I applaud the President for setting these worthy goals, but I question how achievable it is. Corn harvests won't be large enough to meet either of the President's 35 billion or 60 billion gallon targets and alternatives to corn-based ethanol aren't yet economically viable, but I hope they will be. As we are going to hear today, the U.S. currently doesn't have the infrastructure in place.

While the U.S. continues on its pursuit of alternative energy, I would like to remind my colleagues of the good we can do and the gains we can make from simply making our vehicles more fuel efficient. I hope our witnesses today will be able to shed light on the progress that is being made in relation to biofuels and what we can do to advance its development in hopes of meeting or exceeding the President's goals.

Thank you, Mr. Chairman, and I yield back the remainder of my time.

Mr. BOUCHER. Thank you, Ms. Hooley. The gentlewoman from Wisconsin, Ms. Baldwin, is recognized for 3 minutes.

OPENING STATEMENT OF HON. TAMMY BALDWIN, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF WISCONSIN

Ms. BALDWIN. Thank you, Mr. Chairman. I am pleased that we are continuing our alternative fuels discussion that we began a few weeks ago. Our Nation is producing renewable fuels at record rates and we now have the ability to expand our production even more. It is time for us to take significant advantage of this opportunity to advance our use of home-grown biofuels and in turn, reduce our dependence on foreign oil and prepare ourselves for a post-petroleum economy of the future.

Renewable fuels have been good for our environment, our economy and our farmers and our Nation's energy future. The standard included in the Energy Policy Act of 2005 has led to significant growth in the ethanol and biodiesel industries. In my home State of Wisconsin, we are well on our way to producing more than 500 million gallons of ethanol annually and we will still be producing more than 70 million gallons of biodiesel. These production levels have reinvigorated rural Wisconsin and similar production levels across the country have revived rural America.

But if we are going to use the opportunity presented to us today and expand on renewable fuels production, we must ensure that it is done with clean and environmentally friendly transportation fuels, those that lessen our greenhouse gas emissions and protect our air, water and natural resources. I have significant concerns about replacing the Renewable Fuels Standard with an alternative fuel standard. By altering the standard, we are opening up our Nation's mandate to an entirely new source of energy production, coal-to-liquid. And while coal-to-liquid may be a domestic fuel source, its greenhouse gas emissions could be as much as twice as high as petroleum based fuels.

At a time when our committee is prepared to take bold action to reduce the greenhouse gas emissions causing climate change, I am at a loss for why we would support increased production of a fuel that would increase CO² levels. I am hopeful that this hearing will shine a light on the truth about coals to liquid so that we can move forward with policies that will promote our environmental stewardship and our energy independence.

I also look forward to hearing from the witnesses about ways in which we can improve the infrastructure that is supporting the renewable fuels industry. For instance, is our transportation infrastructure, such as rail, able to handle the increased supply of ethanol while providing reasonable shipping rates? What incentives can we provide to promote consumer awareness about the availability of clean fuels and what role do Federal, State and local governments play in encouraging the use of flex fuel vehicles and E-85 fuel?

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

Mr. BOUCHER. Thank you very much, Ms. Baldwin. The gentleman from Georgia, Mr. Barrow.

Mr. BARROW. Mr. Chairman, I will waive.

Mr. BOUCHER. Mr. Barrow waives.

Any statements for the record will be accepted at this time.

[The prepared statement of Mr. Barton follows:]

**Statement of the Honorable Joe Barton
Ranking Member, Energy and Commerce Committee
Alternative Transportation Fuels: An Overview
Tuesday, May 08, 2007**

Thank you, Chairman Boucher, for scheduling this second hearing on alternative fuels.

Exploring new methods to promote energy security by reducing our reliance on unstable foreign sources of energy is timely and certainly a good thing.

But I remain concerned about unintended consequences already beginning to result from our expanded use of ethanol. These include:

- supply limitations of agricultural feedstocks;
- effects on food prices;
- infrastructure limitations;
- conflicting environmental effects;
- energy supply for fuel conversion;
- effects on fuel prices; and
- energy content of the fuel.

These are all real issues that need careful consideration before we take further action to expand use of these fuels. According to a U.S.D.A. study, **“it takes nearly as much energy (through natural gas based fertilizers, farm equipment, transformation from corn or other materials, and transportation) to create ethanol as the ethanol itself produces when put to work.”**

We all hope for great breakthroughs in technologies to commercialize cellulosic ethanol, which can be derived from everything from turkey carcasses to municipal solid waste. Cellulosic may hold tremendous promise for our energy security and our future.

However, as promising as these technologies are, none of us are driving cars that run on cellulosic fuel because no one has been able to develop a commercial-scale plant for real production. I am interested to learn today from DOE, EPA, and our other witnesses about what’s slowing things down and what Congress can do to speed them up without making things worse by straining the already fragile and complex fuels delivery network in this country.

These answers do not come easy. If we had them now, there wouldn’t be such debate. Will more federal incentives, mandates, loan guarantees and

R and D provide the solutions for many -- or any -- of the unintended and very unhappy consequences? It's too early to tell.

One thing we do know is that the corn ethanol industry is booming. The most recent information I have is that as of February 2, 2007, existing U.S. ethanol plant capacity was a reported 5.6 billion gallons per year, with an additional capacity of 6.1 billion gallons of capacity under construction. This production capacity is well in excess of the 7.5 billion gallon supply required in 2012 by the Renewable Fuel Standard in EPACT 2005.

As production soars, will demand soar, too? Right now, ethanol is still only about 3.6% of annual gasoline demand on a volume basis, and only about 2.4% on an energy basis.

Of course, more domestic production of oil and gas is badly needed, too. If we develop more domestic natural gas, and build more non-gas fired electricity generation, we could talk seriously about using compressed natural gas to fuel trucks, buses, and even cars. This could turn out to be a competitive and environmentally friendly alternative to foreign oil and we should not rule it out.

However, it seems to me that if we want to make a real difference in energy security that all options should be on the table, and that fungibility considerations to get these new sources into the fuel supply should begin to take a priority in the deliberations. All of these breakthroughs in technology are wonderful.

But new fuels will go the way of the boilers in a Stanley Steamer if we can't deliver fuels to the consumer because pipelines won't work, or the dispensers aren't compatible, or engines won't run, or you just don't have a car to match the new and exotic fuel.

We will hear from some of the people who work on these issues. I hope that all involved in the fuel production and delivery process are working together to facilitate the transitions that will need to take place if we are serious about making a difference.

3.6 percent of the fuel market is a start, but it's not energy security or anything close. Maybe the day will come when energy companies are fuel neutral, engaged in selling energy in all its forms. Until that day we need to

engage all aspects of industry that currently have expertise in producing and delivering the various forms of energy to consumers, so we can make a real difference in gaining energy security.

I yield back the balance of my time.

Mr. BOUCHER. I am pleased now to recognize our first panel of witnesses and we welcome to the subcommittee this morning, representing the administration, first, Mr. Bob Meyers, who is the Associate Administrator of the Office of Air and Radiation of the Environmental Protection Agency, certainly no stranger to this committee. And Mr. Meyers, we welcome your return to the committee this morning. We also welcome Mr. Andrew Karsner, the Assistant Secretary for Energy Efficiency and Renewable Energy for the U.S. Department of Energy, who testified before our subcommittee last week. We enjoyed your testimony so much, we decided to have an encore this morning and we welcome you, as well.

Without objection, your prepared written statements will be made a part of the record. We would welcome your oral summaries and ask that you keep those to approximately 5 minutes. Mr. Meyers, we will be pleased to begin with you.

STATEMENT OF ROBERT MEYERS, ASSOCIATE ASSISTANT ADMINISTRATOR, OFFICE OF AIR AND RADIATION, ENVIRONMENTAL PROTECTION AGENCY, WASHINGTON, DC

Mr. MEYERS. Thank you, Mr. Chairman and members of the subcommittee. I also appreciate the opportunity to come before you today and testify on how the expanded use of renewable and alternative fuels supports the President's goals of enhanced energy security and strengthen environmental protection. Your letter of invitation asks three questions and I am going to try to attempt to address each one in the order that they were asked.

First, with regard to the status of the Renewable Fuels Standard, or RFS, on April 10 Administrator Johnson signed the RFS rule and the rule published just a few days ago, on May 1. Initial compliance with the RFS rule will be required on September 1, 2008. This rule implements section 211(o) of the Clean Air Act established by the Energy Policy Act of 2005. Although the rule and its accompanying analysis run many hundreds of pages, this wide-ranging rule actually accomplishes a very direct and straightforward result. It essentially provides the rules of the road for our best implementation, including a credit trading program that works within existing market structures.

EPA estimates that by 2012, the transition to renewable fuels will result in reductions of between 2 and 3.9 billion gallons of petroleum consumption per year. In the same year, we estimate that the RFS and increased use of renewable fuels will achieve reductions in carbon dioxide and equivalent greenhouse gas emissions between 8 and 13.1 million metric tons. Further effects on the air quality are detailed in my written statement and included in the agency's accompanying regulatory impact statement.

I should note that EPA's analysis of the rule acknowledges that renewable fuel use in the transportation sector will very likely exceed the mandates established in the RFS. Experience to date has warranted this out. However, it should be emphasized that the promulgation of a final rule allows such use to occur with the existence of a flexible credit trading and banking system and with proper verification. In addition, section 211(o) only specifies RF levels through 2012; years following are subject to administrative determination. Thus, the RFS rule will remain a vital part of the renew-

able fuel implementation for the foreseeable future at what volumes are experienced.

You also requested views with respect to proposals to change the RFS by increasing the amount of renewable fuels required or to expand specific requirements on feedstock will burden the overall mandate. My written testimony and the testimony of Assistant Secretary Karsner details the administration's legislation to enact the Alternative Fuel Standard or AFS. Along with the legislation the administration has on reformed CAFE, the AFS responds to the President's challenge in the State of the Union address to reduce gasoline consumption by 20 percent in the next 10 years.

The AFS builds off a structure of the RFS and specifies that 35 million gallons of alternative fuel be used in the Nation's transportation fuel by the year 2017. The AFS would include all fuels that are currently part of the RFS. It would include fuels currently classified as alternative fuels under the Energy Policy Act, as well as other fuels that can qualify as alternative fuels.

On a fundamental level, then, this structure should provide additional competition to the alternative fuel marketplace. The AFS defines ethanol, butanol, natural gas, liquefied petroleum gas, hydrogen, coal-to-liquids and electricity among its included fuels. As proposed by the administration, the AFS would replace the RFS in the year 2010, but would retain the flexible credit and banking and trading mechanisms pioneered in the RFS. The legislation provides for an accelerating schedule for AFS requirements in the years 2010 through 2017.

Although different AFS fuels will serve to offset greenhouse gas emissions by different amounts, increasing the use of fuels under an AFS program could result in greater greenhouse gas emission reductions in our current mix of fuels. For example, one advantage of the longer timeframe provided by the President's proposal, along with market incentives it creates, is allowing for commercial development of cost-competitive cellulosic ethanol.

Cellulosic ethanol may achieve very large greenhouse gas reductions, up to 90 percent compared with petroleum based gasoline. Other fuels like electricity, compressed natural gas and liquefied natural gas can achieve substantial greenhouse gas reduction. Ultimately, the level of greenhouse gas reductions achieved by the AFS will depend on the implementation of the program, market forces, the incentives available for the development of various renewable and alternative fuels and the mix of fuels used to meet the target.

Finally, you asked about policies that Congress could enact that would hasten the development and deployment of necessary infrastructure. Obviously, I will point to Twenty in Ten and the legislation the President has put forth and the very real incentives that this legislation can produce by expanding and building upon the structure Congress enacted in the RFS. We stand ready to work with this committee and Congress as you move to consider Twenty in Ten and related legislation.

In addition, I would be remiss if I also did not note that EPA's initiated a voluntary partnership that can lead to greater penetration of the E-85 structure. The initiative is designed to expand our existing program to promote the introduction of E-85 in transportation quarters and among fleets.

Thank you, Mr. Chairman and members of the subcommittee, for this opportunity. This concludes my prepared statement and I would be pleased to answer any questions that you might have.
[The prepared statement of Mr. Meyers follows:]

**ROBERT MEYERS
ASSOCIATE ASSISTANT ADMINISTRATOR
OFFICE OF AIR AND RADIATION
U.S. ENVIRONMENTAL PROTECTION AGENCY**

**BEFORE THE COMMITTEE ON ENERGY AND COMMERCE
SUBCOMMITTEE ON ENERGY AND AIR QUALITY
U.S. HOUSE OF REPRESENTATIVES
MAY 8, 2007**

Mr. Chairman, and members of the Subcommittee, I appreciate the opportunity to come before you today to testify on how the expanded use of renewable and alternative fuels supports the President's goals of enhanced energy security and strengthened environmental protection.

Introduction

In his 2007 State of the Union Address, the President challenged the nation to address our growing reliance on oil. He called for reducing gasoline consumption by 20 percent in the next 10 years, while doing so in a way that keeps America's economy growing and protects our environment. This "Twenty in Ten" plan includes a proposed requirement for 35 billion gallons of alternative fuel in 2017. This aggressive goal would build upon EPA's current renewable fuel standard, or RFS program, and require the use of renewable and alternative fuel well beyond the 2012 target set by the Energy Policy Act of 2005 (EPAct 2005). Expanding this mandate is expected to decrease projected gasoline use by 15 percent. The President's plan seeks to achieve another five percent reduction in gasoline consumption through the Administration's proposal to reform CAFE standards for passenger cars and to extend the current light truck rule. The President's energy plans also emphasize the energy security benefits of increasing domestic oil and gas production and doubling the current capacity of the Strategic Petroleum Reserve.

“Twenty in Ten” would diversify the sources and types of fuels we use, while reducing our vulnerability to supply disruptions, sudden price increases, and our overall dependence on oil. At the same time, the plan could help confront the serious challenge of climate change. Attaining these goals will require significant advancements in technology and careful assessment of their benefits and costs. Most importantly, Congress must pass legislation to allow these programs to become a reality.

The Alternative Fuel Standard

The Administration’s proposed Alternative Fuel Standard sets forth an ambitious, but achievable, path forward for an expansion of the use of renewable and alternative fuels. The AFS specifies that 35 billion gallons of alternative fuel be used in the nation’s transportation fuel by the year 2017. The AFS would include all fuels that are currently part of the RFS and would include fuels currently classified as “alternative fuels” under the Energy Policy Act. It would also allow other types of fuels to qualify as alternatives for compliance, adding competition in the alternative fuel marketplace. The AFS includes fuels or fuel components such as ethanol (derived from a variety of sources, including corn and cellulosic feedstock), biodiesel, butanol, as well as other alternatives to crude oil-based fuels such as natural gas, hydrogen, and coal-to-liquids. The AFS would also include the use of electricity to power advanced vehicles, including “plug-in” hybrid vehicles.

As proposed by the Administration, the AFS would replace the RFS in the year 2010, but would retain the flexible credit, banking and trading mechanisms contained in the RFS. The legislation provides an accelerating schedule for AFS requirements in the years 2010 to 2017.

After 2017, similar to the RFS, the level of the AFS would be set administratively based on several factors including the impact of alternative fuels on energy security and diversification, costs to consumers, job creation and the environment.

The AFS also includes different kinds of “safety valves” to protect economic and environmental interests. For example, the Administration will be required to review the impact of the AFS annually and may adjust the annual requirement if short or long term conditions exist that adversely affect the production or importation of alternative fuels. Under certain circumstances, the Administration could issue a temporary waiver of any or all the requirements of the AFS. The AFS also includes an automatic “safety valve” that serves as an “economic backstop” to ensure that mandating 35 billions of alternative fuel does not excessively increase the cost of gasoline and diesel to American consumers. By allowing the sale of credits at \$1 per gallon of ethanol (or about \$0.67 per gallon of gasoline equivalent), the “safety valve” guards against unforeseen increases in the prices of alternative fuels or their feedstocks, protecting other markets from being adversely impacted and minimizing costs to consumers. This feature provides some market certainty—businesses can calculate their maximum cost of compliance. They then can use their ingenuity to deliver value and minimize their compliance costs.

The AFS provides an opportunity to address two important national goals—improving our energy security and potentially reducing greenhouse gas emissions from the transportation sector. EPA has estimated that the RFS would help achieve greenhouse gas emissions of up to 13 million metric tons in 2012. Although different AFS fuels will serve to offset greenhouse gas

emissions by different amounts, increasing the use of fuels under an AFS program could result in greater greenhouse gas emission reductions than our current mix of fuels. For example, one advantage of the longer timeframe provided by the President's proposal, along with the market incentives it creates, is allowing for commercial development of cost-competitive cellulosic ethanol. Cellulosic ethanol may achieve very large greenhouse gas reductions—up to 90% compared to petroleum-based gasoline. Other fuels like electricity, compressed natural gas, and liquefied natural gas can achieve substantial greenhouse gas reductions. Ultimately, the level of greenhouse gas reductions achieved by the AFS will depend on the implementation of the program, market forces, the incentives available for the development of various renewable and alternative fuels and the mix of fuels used to meet the target.

The National Renewable Fuels Standard

On April 10, Administrator Johnson signed the National Renewable Fuels Standard Rule, which establishes a comprehensive program that will lead to more than doubling the amount of renewable fuel use between 2006 and 2012. This landmark rule provides market certainty for the expanded production and use of renewable fuels by requiring minimum amounts of renewable fuel volumes to be used in our nation's transportation fuel supply. It also establishes important compliance and implementation measures necessary to assure that these minimum volumes are met. The AFS would build upon the recently completed RFS regulation -- the first milestone in increasing the amount of domestically-produced renewable fuels used in motor vehicles.

The core compliance measure of the RFS, the credit trading program, was carefully designed by EPA staff in close collaboration with various stakeholders. It works with the

existing markets by allowing renewable fuels to be blended when and where it makes sense, while maintaining the necessary flexibility to expand the number and types of fuels as they come to the market.

EPA conducted a number of detailed analyses of the RFS program, including the energy, emissions, air quality, and economic impacts of expanded renewable fuel use. These impacts vary depending on the volume and type of renewable fuel anticipated to be used. Our analyses projected fuel use in 2012 using both the minimum volume of renewable fuel required under EPCA2005 and higher volumes projected in the Energy Information Administration's 2006 Annual Energy Outlook. Thus, the results of EPA's analysis show a range based on these two projections using a 2004 baseline.

With regard to petroleum consumption impacts, EPA estimates that this transition to renewable fuels will result in reductions of between 2.0 and 3.9 billion gallons of petroleum consumption, or roughly 0.8 to 1.6 percent of the approximately 250 billion gallons of petroleum that would otherwise be used in the transportation sector in 2012. EPA also projected that the RFS also will achieve reductions in carbon dioxide equivalent greenhouse gas emissions between 8.0 and 13.1 million metric tons, or about 0.4 to 0.6 percent of the anticipated greenhouse gas emissions from the transportation sector in the United States in 2012. EPA's analyses additionally found that with regard to other emissions impacts, this program could help reduce carbon monoxide emissions from gasoline-powered vehicles and equipment between 0.9 and 2.5 percent and emissions of benzene, a toxic mobile source air pollutant, between 1.8 and 4.0 percent.

At the same time, however, other vehicle emissions may increase, including volatile organic compounds, or VOC's, and oxides of nitrogen, or NOx, both of which are precursors of ozone. These effects will vary significantly by region: areas that already use ethanol blended into gasoline will experience little or no additional change in vehicle emissions or air quality. Those areas where ethanol use increases substantially as a result of the RFS program may see an increase in VOC emissions between 4 and 5 percent and an increase in NOx emissions between 6 and 7 percent from gasoline-powered vehicles and equipment. Emissions of certain air toxics, like acetaldehyde, also increase although the overall volume of such emissions is not large in comparison with the volume of reductions in benzene.

EPA's analysis also included a look at the potential impacts on the nation's agricultural sector. This work found that an increase in the use of renewable fuels associated with the RFS promotes rural development by increasing annual aggregate farm income between \$2.7 and \$5.4 billion dollars in 2012. In addition, EPA's analysis estimated a possible modest increase in food costs and a potential decrease in exports of certain agricultural commodities such as corn

With regard to implementation, the RFS program builds on the Agency's three decades of experience implementing innovative transportation clean fuel programs. For example, over the past decade, EPA's fuel programs have pioneered the use of secure electronic data collection. As part of our fuel program compliance activities, EPA currently collects thousands of reports each year through a sophisticated data system that both assures quality and tracks and reports information from fuel producers and distributors across the country. This system has unique capability to process confidential business information (CBI) electronically.

In addition to electronic reporting, the RFS also uses flexible regulatory mechanisms like averaging, banking, and trading (ABT). We have found incorporating ABT programs assists the fuels industry by providing the flexibility to generate, hold, sell or purchase compliance credits at times and at appropriate volumes that best allow companies to meet their RFS regulatory obligations. The recent gasoline and diesel sulfur reduction programs are successfully using ABT flexibility.

Altogether, the President's AFS proposal recognizes the critical need to reduce our nation's dependence on foreign oil as well as to address rising emissions of greenhouse gases from motor vehicles and off-road vehicles. EPA's success in crafting and adopting RFS regulations under EPAct 2005 has proven to be a critical first step in the national expansion of renewable and alternative fuel use in the transportation sector. As Congress considers ways to build on this success, the country now has a model that should help assure the long-term viability of a renewable and alternative fuels program. EPA stands ready to work with Congress to enact the Alternative Fuel Standard into law.

Thank you, Mr. Chairman, and the members of the Subcommittee for this opportunity. This concludes my prepared statement. I would be pleased to answer any questions that you may have.

Mr. BOUCHER. Thank you very much, Mr. Meyers. Mr. Karsner.

STATEMENT OF ALEXANDER A. KARSNER, ASSISTANT SECRETARY, ENERGY EFFICIENCY AND RENEWABLE ENERGY, U.S. DEPARTMENT OF ENERGY, WASHINGTON, DC

Mr. KARSNER. Chairman Boucher, members of the committee, thank you for the opportunity to present the administration's views on its Twenty in Ten goal and to discuss programs under way at the Office of Energy Efficiency and Renewable Energy, EERE, at the Department of Energy to accelerate the development and deployment of renewable fuels and alternative fuels that will reduce our Nation's dependence on oil and enhance our energy security.

In his 2007 State of the Union address, President Bush challenged our country to reduce gasoline consumption by 20 percent within the decade, the Twenty in Ten plan. The President called for a robust Alternative Fuel Standard requiring the equivalent of 35 billion gallons of renewable and alternative fuels. The goal is a significant expansion of the 7.5 billion gallon target now in law for 2012 under the Renewable Fuels Standard. The Twenty in Ten plan holds the promise of diversifying our sources, types and volumes of fuels we use, while reducing our vulnerabilities and dependencies on oil. Only through transformational technological change can these goals be achieved and we believe the administration's proposals provide the tools to achieve them.

The Department's portfolio of research, development and commercialization activities support the Twenty in Ten and longer-term clean energy goals. The Department is particularly focused on solving technical problems to overcome the barriers to biofuels growth through a strategic cost-shared partnership with private industry and collaboration with other agencies. Together, with the financial tools already included in EPAct 2005, we believe that this multi-pronged effort will expand the role of domestically produced biofuels in our Nation's energy supply and our economic future.

Our biomass program is focused on making cellulosic ethanol cost competitive by 2012, a target put forth in the President's 2006 Advanced Energy Initiative. Just last week, Secretary Bodman announced the availability of up to \$200 million for cellulosic bio-refineries at 10 percent of commercial scale, subject to appropriations. The 10 percent scale demonstrations have the potential to reduce the overall cost and risk to industry and contribute to the quicker commercialization of larger scale facilities.

Additionally, DOE will invest up to \$385 million for as many as six commercial scale bio-refineries over the next 4 years, subject to appropriations. The development and deployment of a biofuels distribution infrastructure in the United States is fundamental to providing for displacement of gasoline and increased consumer choice.

To bring these issues into focus, the Department has developed a biofuels infrastructure team to support greater convergence between our vehicle technologies and biomass program. As a result, the Department is pursuing a growing number of infrastructure activities, including analyses of feedstocks, pipelines, terminal facilities, storage and vehicle technologies. The President's Twenty in Ten goal holds the promise of accelerating penetration of cellulosic ethanol and other alternative fuels into the marketplace and bring-

ing the benefits of a clean, renewable and alternative energy source more quickly to the Nation.

To meet these challenges, cutting edge research, development, deployment and commercialization must indeed be supported by transformational policy changes, the types of proposals that the President in the State of the Union. The administration looks forward to working with Congress to shape these policies and legislation that can make this happen.

This concludes my prepared statement and I would be happy to answer any questions the committee may have.

[The prepared statement of Mr. Karsner follows:]

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STATEMENT OF
ALEXANDER KARSNER
ASSISTANT SECRETARY FOR ENERGY EFFICIENCY
AND RENEWABLE ENERGY
U.S. DEPARTMENT OF ENERGY

BEFORE THE

SUBCOMMITTEE ON ENERGY AND AIR QUALITY
COMMITTEE ON ENERGY AND COMMERCE

UNITED STATES HOUSE OF REPRESENTATIVES

May 8, 2007

Mr. Chairman, Members of the Committee, thank you for the opportunity to present the Administration's views on its "Twenty in Ten" goal, and to discuss programs under way in the Office of Energy Efficiency and Renewable Energy (EERE) at the Department of Energy (DOE) to accelerate the development and deployment of renewable fuels and other alternative fuels that will reduce our Nation's dependence on oil and enhance our energy security.

In his 2007 State of the Union address, President Bush challenged our country to reduce gasoline consumption by 20 percent in the next 10 years, the "Twenty in Ten" plan. The President called for a robust Alternative Fuel Standard, requiring the equivalent of 35 billion gallons of renewable and alternative fuel in 2017. This goal is a significant expansion of the 7.5 billion gallon target now in law for 2012, under the existing Renewable Fuels Standard. Expanding the mandate established by the Energy Policy Act of 2005 (EPACT 2005) is expected to decrease projected gasoline use by 15 percent. Another five percent reduction in gasoline consumption can be achieved through the Administration's proposal to reform CAFE standards. The "Twenty in Ten" plan holds the promise of diversifying the sources, types, and volumes of fuels we use, while reducing our vulnerabilities and dependence on oil. Only through transformational technological change can these goals be achieved, and we believe that the Administration's proposals provide the tools to achieve them.

The AFS would establish new minimum requirements starting in 2010 at 10 billion gallons that would increase each year to 35 billion gallons in 2017. As with the current Renewable Fuel Standard, the minimum requirements are measured in terms of gallons of ethanol. Qualifying fuels that have a higher energy content (compared to ethanol) would have a compliance value greater than one, while those with lower energy content would have a compliance value of less than one. These compliance values are used to make sure fuels that displace more petroleum used in transportation receive proportionally more credit than those that displace less petroleum. This is consistent with the level playing field approach of the President's proposal.

There is clear consensus that legislative action is needed to substantially reduce our dependence on oil and deploy new energy technologies into the marketplace at an unprecedented scale and rate. The Administration looks forward to working constructively with the Congress to achieve the "Twenty in Ten" goal, and deliver legislation for the President's signature before the driving season is under way.

Supporting the "Twenty in Ten" and longer term clean energy goals is the Department's portfolio of research, development, and commercialization activities. The Department is particularly focused on solving technical problems to overcome barriers to biofuels growth, including infrastructure, through forging strategic cost-shared partnerships with private industry, collaborating with other agencies, and working with the different regions of our country to bring the promise of biofuels to fruition. Combined with the financial tools already included in EPACT 2005, we believe that this multi-pronged effort will expand the role of domestically produced alternative fuels in our Nation's energy supply and economic future.

BIOENERGY RESEARCH AND DEVELOPMENT

EERE's Biomass Program and Vehicle Technologies Program, as well as other Department programs such as those within the Office of Science, are working closely together to provide technology pathways to meet the "Twenty in Ten" goal. The Office of Science is conducting basic research for breakthroughs in systems biology to identify new biofuel-producing organisms or new bioenergy crops that could lead to cost reductions for cellulosic ethanol and other biofuels. To accelerate the

transformational scientific breakthroughs necessary for cost-effective production of biofuels and bioenergy, including cellulosic ethanol, the Office of Science is investing \$375 million over five years to support the establishment and operation of three Bioenergy Research Centers. These centers, selected by competitive, merit-based scientific review, will conduct comprehensive, multidisciplinary research programs on microbes and plants to develop innovative biotechnology solutions to energy production.

EERE and various U.S. Department of Agriculture (USDA) agencies conduct the applied research for advancing biomass feedstocks and conversion technologies for biorefineries. Currently, ethanol is the renewable fuel with greatest market penetration and potential for both near and long-term displacement of gasoline. EERE's Biomass Program is focused on making cellulosic ethanol cost-competitive by 2012, a target put forth in the President's 2006 *Advanced Energy Initiative* (AEI). In Fiscal Year (FY) 2007, including funds appropriated under the Continuing Resolution, the Department has allocated approximately \$200 million for EERE's Biomass and Biorefinery Systems R&D program to implement key activities necessary to achieve the 2012 goal for cost-competitive cellulosic ethanol.

Just last week, Secretary Bodman announced the availability of up to \$200 million for cellulosic biorefineries at 10 percent of commercial scale, subject to appropriations. This effort will enable industry to resolve remaining technical and process integration uncertainties and allow for more predictable, less costly scale up of "next generation" biorefinery process technologies. The 10 percent-scale demonstrations have the potential to reduce the overall cost and risk to industry and contribute to the quicker commercialization of larger-scale facilities. Additionally, DOE will invest up to \$385 million for as many as six commercial-scale biorefinery projects over the next four years, subject to appropriations. The EERE Biomass Program will continue in FY 2007 to support its cost-shared efforts with industry to develop and demonstrate technologies to enable cellulosic biorefineries for the production of transportation fuels and co-products.

ETHANOL AND BIOFUELS INFRASTRUCTURE DEVELOPMENT

The Department is working with other public and private sector partners to encourage development and deployment of a biofuels distribution infrastructure in the United States to provide for displacement of gasoline and increased consumer choice. To support this effort and help promote growth of the biofuels industry, the Department has developed a biofuels infrastructure team. This team works to promote convergence between Vehicle Technologies and the Biomass Programs to promote a biofuels industry and commercially competitive alternative fuels and vehicles. Currently, there are more than six million flexible-fuel vehicles (FFVs) on the road in this country, a significant number, but still a relatively small percentage of the approximately 225 million light duty vehicles in the U.S. One goal is to expand the use of biofuels by increasing the number of FFV owners. This would be done by improving current biofuels infrastructure and adding fueling stations to make FFV use more convenient for consumers. Another goal is to encourage all automobile manufacturers serving the U.S. market to meet and exceed state voluntary targets and significantly increase production of FFVs.

In support of these goals the Department is pursuing a number of infrastructure activities, including analyses of pipelines, water issues, and advanced vehicle technologies. The biofuels infrastructure team is also assessing the impacts of higher-level intermediate blends of ethanol (e.g., E15 and E20), renewable fuels pipeline feasibility and materials research, and optimization E85 alternative fuel vehicles. This work is being coordinated with the Department of Transportation, which has

responsibility for setting integrity management standards for pipeline transportation and ensuring that these products can be safely handled, and with the Environmental Protection Agency, which has responsibility for testing the emissions impacts of fuels and vehicles, and registering and certifying fuels and fuel additives before they can be used in the transportation system.

The Vehicle Technologies Program has embarked on several new efforts to address vehicle efficiency, beyond ongoing combustion and fuels research. These new efforts include evaluation of the Biowagon produced by SAAB, a manufacturing subsidiary of GM, which is sold exclusively in Europe and has been reported to use ethanol-based fuels much more efficiently than current U.S. FFVs. Another new effort is focused specifically on optimizing engine efficiency with biofuels. These projects are aimed at mitigating the lower energy content of biofuels. The program is also evaluating other biofuels such as biodiesel that may contribute to future gasoline displacement. And, Vehicle Technologies has initiated an effort to engage international collaborations to address fuel standards, data sharing, and other common interests.

INTERAGENCY ENERGY PARTNERSHIPS

In addition to infrastructure and fuels research within the Department, there are important collaborations with other Federal agencies and entities, including the Interagency Biomass Research and Development Board, which I co-chair with USDA. The Board is the governing body that coordinates biomass R&D activities across the Federal Government. In November 2006, DOE hosted the National Biofuels Action Plan workshop in Washington DC, where representatives from multiple Federal agencies came together to identify agency roles and activities, assess gaps and synergies, and begin developing agency budgets in the area of biofuels. The Federal participants also made recommendations for improved coordination and collaboration across Federal agencies. Input from the workshop is currently being collected into the National Biofuels Action Plan workshop report. Ultimately, the goal is to improve the Board's ability to provide coordinated Federal support for biofuels production and use.

To promote the growth of local biorefineries and address biomass resource availability and feedstock infrastructure, DOE is supporting the Regional Biomass Energy Feedstock Partnerships with USDA and Sun Grant Initiative universities, which are funded through the Department of Transportation. These partnerships will help to identify the regional biomass supply, growth, and biorefinery development opportunities. We believe that using regionally available feedstocks, produced and processed locally, will allow a "distributed" transportation fuels approach that should reduce shipping and transportation issues. These regional partnerships are designed to collect and store data on a publicly available website.

LOAN GUARANTEE PROGRAM

To provide increased incentives for financing a multitude of innovative energy technologies, including biofuels, EPACT 2005 included a provision in Title XVII for a DOE Loan Guarantee Program. With its central focus on innovative technologies to avoid, reduce, or sequester air pollutants or anthropogenic greenhouse gas emissions, the Loan Guarantee Program provides broad authority for DOE to guarantee loans that support early commercial use of advanced technologies, including cellulosic biorefineries that employ new or significantly improved energy technologies.

I am pleased to report that the funding contained in the FY 2007 Continuing Resolution is allowing the Department to move forward in implementing the Loan Guarantee Program and standing up a Loan Guarantee Program Office within the Department. We are currently working on a draft Notice of Proposed Rulemaking to implement the program. Secretary Bodman has said that our goal is to have a high-quality program, and the Department is working to do just that. As you know, the Department undertook a process in FY 2006 to solicit pre-applications for the first round of loan guarantees. The Loan Guarantee Program represents an important tool for transforming the energy portfolio in this country.

CONCLUSION

The President's "Twenty in Ten" goal holds the promise of accelerating penetration of cellulosic ethanol and other alternative fuels into the marketplace and bringing the benefits of a clean renewable and alternative energy source more quickly to our Nation. To meet these challenges, cutting edge research, development, deployment, and commercialization must be supported by transformational policy changes – the types of proposals that the President articulated in the State of the Union. The Administration looks forward to working with Congress to shape policies and legislation that will make this happen. This concludes my prepared statement, and I would be happy to answer any questions the Committee members may have.

Mr. BOUCHER. Well, thank you very much, Mr. Karsner, and thank you, also, Mr. Meyers. My questions are propounded to both of you or to either who chooses to answer.

The President's target of 35 million gallons of alternative fuels by 2017 is certainly an aggressive target and I note that in order to meet that, the President is proposing to encompass, within the category of alternatives, both those fuels that are currently part of the Renewable Fuels Standard and other fuels, as well. I would assume that within the category of the other fuels encompassed would be coal-to-liquids. Is that correct, Mr. Meyers?

Mr. MEYERS. Yes. The bill uses EPA's definition of alternative fuel, which currently includes coal-to-liquids.

Mr. BOUCHER. Do you have, within the proposal, any specific targets for each type of fuel that would be covered?

Mr. MEYERS. No, the legislation does not establish specific targets for any one fuel.

Mr. BOUCHER. Cellulosic ethanol will obviously be a large part of how this new mandate would be fulfilled. Currently, there are no commercial cellulosic ethanol production facilities, so at what point do you anticipate that cellulosic ethanol will be commercially viable and added to the production? And then looking over a 10-year period, to the end point of your mandate, how much do you think cellulosic ethanol will contribute to achieving that 35 billion gallon per year total? Mr. Karsner.

Mr. KARSNER. Mr. Chairman, I agree with the premise of your question that cellulosic ethanol can and likely will be amongst the largest contributors to such a mandate being fulfilled. As Bob indicated, we don't like to choose what the balance would be between the technological pathways that would get us there. We have very deliberate plans at the Department of Energy to stand up competitive commercial-ready cellulosic ethanol facilities by 2012. At that point the question is at what rate can they be replicated across the Nation? What is the policy environment? Is it durable and predictable enough for investors to amass sufficient capital to replicate commercial scale facilities that will matter?

Mr. BOUCHER. And so just picking a number, do you have a sense of how much contribution to this 35 billion gallon mandate cellulosic ethanol will be?

Mr. KARSNER. I don't have such a number because it is impossible to isolate exclusively the viability of the technology away from what the policy environment conditions are that will ultimately drive the capital market investments. All three of those factors have to work in harmony. What I can say is that I do believe cellulosic ethanol is sufficiently technologically mature and not requiring technological breakthroughs, that if the policy environment were correct, it could accelerate much faster.

Mr. BOUCHER. So in order to derive this 35 billion gallon annual number, you did not assign specific projected volumes to individual fuels, including cellulosic ethanol or coal-to-liquids. You simply assume that the combination of all of them could get us to 35 billion gallons. Is that accurate to say?

Mr. KARSNER. I think it is correct to say that rather than taking any one fuel type, it was the President's objective to take a top line objective, which was 20 percent reduction in our gasoline supply

within the decade and create as open a platform as possible to enable as many alternatives to gasoline to compete.

Mr. BOUCHER. One of the major problems that we confront is the adequacy of the infrastructure for alternative fuels in the United States at the retail level. Service stations don't have sufficient availability of ethanol and E-85 pumps in order to satisfy the flexible fuel vehicle demand that is anticipated. There are issues about the availability of flexible fuel vehicles. Does your proposal encompass any infrastructure upgrades and to what extent have you treated this obvious need in the recommendations coming from the administration?

Mr. KARSNER. The alternative fuels proposal does not directly address how to bring about the infrastructure necessary for retail delivery. There is an underlying assumption of market adaptation. We, of course, have the Clean Cities program that works, really, on a voluntary basis with mainly downstream independent retailers to bring on that infrastructure. To give you an idea, last year was a record year. We added 450 stations on top of the Nation's 750 stations, so with about a 70 percent growth rate, we are, as of yesterday, at 1,200 stations that can serve E-85. At that record rate, were we to maintain it, it would still take more than 100 years to get to critical mass, up to about 50,000 stations that are needed to make a difference for E-85 infrastructure.

Mr. BOUCHER. So how do we address that challenge? I understand that your initial proposal does not make specific infrastructure improvement recommendations for our consideration, but do you have recommendations for us or will they be forthcoming from you?

Mr. KARSNER. I think it is a worthy issue for the Congress to deliberate on, to try to examine what forces will enable either voluntary uptake of E-85 distribution predominantly amongst the majors that have been thus far recalcitrant to bring it on board, or whether further policy stimulus is necessary. But if E-85 is to be a primary pathway, we will need a substantially larger growth rate than current mechanisms provide.

Mr. BOUCHER. OK. Thank you both very much. My time has expired. The gentleman from Illinois, Mr. Hastert, is recognized for 5 minutes.

Mr. HASTERT. Thank you, gentlemen. Thank you, Mr. Chairman, for having this hearing today.

Mr. Karsner, I just listening to your testimony. You said you assume that the market would be able to readapt, in your statement. Is there anything that is causing problems, in your mind, that is causing the market not to readapt?

Mr. KARSNER. Yes. The market is like anything else in society, it has imperfections. And there are certain imperfections in the scenario of planning the profitability of private corporations that would not lead them to think in 20- and 30- and 50-year cycles that the Nation requires for this magnitude of adaptation. And so the inherent nature of investing and the net present value calculations needed would lend ourselves towards shorter-term calculations, so there are just limitations inherent in the marketplace.

Mr. HASTERT. What about the ability for the marketplace to work has to have kind of free flow supply and really a free flow of de-

mand. What if there are actual impediments to the demand side? What happens?

Mr. KARSNER. I'm not sure I understand the question. What type of impediments?

Mr. HASTERT. Well, let us say, for something like Underwriters Laboratory insists on not bringing forward a standard for pumps. That would impede a gas station, an oil company or a delivery company for gasoline retail can't get the liability clearance to put in a pump, so does that impede the market?

Mr. KARSNER. Only nominally, only marginally, if at all. How do you mean?

Mr. HASTERT. Nominally or marginally. Well, if you can't buy the gasoline at the station, how do you deliver the product?

Mr. KARSNER. Well, with regard to that specific example, sir, the Underwriters Laboratory issue has largely been bypassed by the State regulators, the fire marshals in the counties and so we haven't seen any significant impediment to the growth of E-85 relative to the examination period for UL to certify those pumps.

Mr. HASTERT. I think you are really off base, because I can tell you, delivery companies won't put in pumps unless they get legal liability. If you can't get legal liability unless they are certified by Underwriters Laboratory. So you got somebody with a fist around the pipeline. Aren't you aware of that?

Mr. KARSNER. Not only are we aware of that, we are working very closely with our laboratories, with Underwriters Laboratories to resolve the issues and we would expect it to be resolved and behind us by the end of this year.

Mr. HASTERT. Well, let me ask you a question. If you are going to resolve the issue and they had every piece of the pump certified last year, then they completely withdrew all those certifications. How are you moving forward? I don't understand that.

Mr. KARSNER. Well, I think it is a question of, as you indicate, the insurance companies, oil distributors that are interested in installing that infrastructure very much value the Underwriters Laboratory's seal of approval. Underwriters Laboratory has its own processes for determining that that seal of approval is. It is not a governmental process, inherently. They had previously, as you indicated, certified independent parts and components, but the very growth rate and nature of E-85 compelled them to take another look at it and say that they wanted to certify the systems holistically. When they did that, we urged them to do that with haste and opened up the national laboratories in a collaborative way to try and get on a very deliberate schedule to do this in a timely manner and we worked with the States and the fire marshals to assure that growth would continue unabated. I do agree with you that it is a constraint, but it is a constraint that I was indicating could be overcome in a very short order.

Mr. HASTERT. Well, Mr. Karsner, if somebody wanted to jiggle the market and make sure that the supply wasn't available and so people who manufacture flex fuel cars have no customers because the customers can't find a gas pump, don't you think that is an impediment? Have you looked farther beyond, just the face of this? Who is holding this up? Why would an institution like Under-

writers Laboratory take everything back off the table? That doesn't make sense.

Mr. KARSNER. Yes, I agree with your sense of urgency, sir, but I hesitate to make Underwriters Laboratory a culprit based on what their own processes for safety inspections, so forth, are. This is really a question of magnitude, so who it is affecting is the independent downstream retailers that are, in fact, very small participants in the distribution—

Mr. HASTERT. I understand that. What I am saying, have you ever thought about maybe having the Justice Department look in at who is doing the funding for Underwriters Laboratory?

Mr. KARSNER. I have not thought of that, sir.

Mr. HASTERT. Well, do you think that might be a good idea?

Mr. KARSNER. I am not sure I am qualified to put an opinion up for—

Mr. HASTERT. I pass.

Mr. BOUCHER. Thank you very much, Mr. Hastert. The gentleman from Texas, Mr. Gonzalez, is recognized for 8 minutes.

Mr. GONZALEZ. Thank you very much. I just wanted to make sure that not only am I efficient, but that I have enough fuel here. Let me ask you, Mr. Karsner, the concern here, in this committee, we are juggling two considerations. One is going to be oil independence, the other is climate change. I am not sure how you incorporate the climate change elements in your policy. The concerns I have, and I am going to play the devil's advocate, but it does not mean that I don't believe that we can forge some sort of policy that will adequately address both of those concerns, but nevertheless, it appears to me that not necessarily that you are putting in all of your eggs in one basket with ethanol, but that you are looking to ethanol as a primary source, as the large or a huge proponent of the solution when it comes to oil independence.

This is my concern, how you factor all this in. Does ethanol provide you better gas mileage, which should be part of the equation? The answer is probably no because it is 20 to 30 percent less efficient as far as a power source than gasoline. Does the production of ethanol increase the use of energies in the production cycle? And my understanding is that it does, but we, again, we are producing an alternative, but it is costing us more in investment in other energies to produce that.

Does it provide advantages when it comes to climate change? Yes and no. My understanding is that, of course, it is one of those things where the benefits might be with carbon dioxide, but not necessarily with nitrogen oxide and other pollutants. Does it cost the Federal Government less in the way of an alternative, that is ethanol? My understanding is that there is a 51 cent a gallon tax credit that is extended to those that use and produce.

The question of food versus fuel. And I know it is not all about corn, but nevertheless, the implications are great. My understanding that, in 2008, half of the United States corn harvest will be directed for ethanol use and of course, we have seen the price increase from \$2 a bushel to \$4 a bushel.

Taking all that into consideration, how do you balance your policy making?

Mr. KARSNER. Is that for me?

Mr. GONZALEZ. Mr. Karsner.

Mr. KARSNER. Yes, sir. You brought up a number of very key issues and like any fuel source, ethanol will have its characteristics, its advantages, its relative disadvantages and all of those can be answered one way or—I will start by saying, first and foremost, it is not selecting ethanol for its endemic characteristics or choosing it as a primary technology pathway, because we don't like to choose technology winners. The reason why ethanol appears to significant is because quantitatively, it has the greatest capacity for volumetric growth relative to displacement of gasoline, so quantitatively rather than qualitatively, it stands out.

With regard to the pricing of ethanol, the energy content question, it is not necessarily the miles per gallon that is really as important, per se, as the price parity for the energy content. In other words, if the pricing of the ethanol you purchase is relative or cheaper on a miles per gallon basis, then price parity is demonstrating that the consumers will take it on. There is a lot of mythology, misinformation and disinformation with regard to the energy content and loss with ethanol, in general, and it is mainly aimed at our conventional ethanol rather than future advanced generation ethanol, cellulosic ethanol, which has significantly different characteristics through biochemical and thermo-chemical platforms.

But let me address it even in the conventional ethanol arena, it will depend on the power source that is used in a conversion process as to what the gains in the energy balance would be, but in all cases, that energy balance, when compared against the fossil energy or petroleum incumbents, should be better and one could make the same statement about ethanol versus gasoline on a greenhouse gas basis and that is, just again, taking the conventional ethanol and comparing it with gasoline, not even going to where we want to go, which is the cellulosic ethanol, which is substantial improvements across the board in all of these.

I won't touch on the food versus fuel debate. It is really the domain of the Department of Agriculture and their economists, to a large degree, except for to say that we are seeing significantly more crop yields and planting, so there is some degree of adaptation and year on year adjustment in the market that is yielding more equilibrium, but of course, these things lag in time, so it is always difficult to take a snapshot in time when you have had a record growth of ethanol on one year and say what is the disparity to corn plantings. I think we will see more and more equilibrium as the fuel source grows.

But the bottom line is for all of these reasons, we focus not on ethanol, but on all technology pathways that are domestic, that are clean and can be made affordable as alternatives to gasoline because that is what our energy security and our environmental needs demand.

Mr. GONZALEZ. My concern, the administration is joined with some Members of Congress in not looking at the overall picture and that is my concern. We are not taking all facets. My fear is we are going to be putting out—there is a feel good message and there is always an inclination to do that and that is a real concern. I wish that we could look at it holistically. I don't think that we are really

doing that and I understand there is a whole lot of politics at play. And I have about 2 minutes. And Robert Samuelson posted, on the 24th of January of this year, had an article—you probably read it and I want you to be able to respond to one of his assertions, which I don't know if it is totally accurate.

Let us do some basic math. In 2006, Americans used 7.5 billion gallons of oil. By 2030 that could increase about 30 percent to 9.8 billion barrels projects the Energy Information Administration. Much of that rise would reflect higher gasoline demand. In 2030, there will be more people, an estimated 365 million versus 300 million in 2006, and more vehicles, 316 million versus 225 million. At most, bond fuels would address part of the increase in oil demand. It wouldn't reduce our oil use or import dependence from current levels.

How do you respond to that?

Mr. KARSNER. I respond by saying that that is a fairly one dimensional mathematical exercise and that I am not sure I agree with your overall premise that we are not looking at this in a holistic, integrated way. It happens to be the primary focus of the subject again, quantitatively, volumetrically, near-term that ethanol and biofuels take up a larger piece of the conversation, but it does not take up a larger priority from the Department of Energy's perspective and the National Laboratory's perspective and so Mr. Samuelson didn't account for what the advances might in lithium ion batteries and the capacity to integrate better fuel injection and compression ratios in our engines and higher efficiency lightweight composites in our vehicles. And so all of these things combined will make up a better fuel future and biofuels will be a piece of it. It is certainly the piece that is nearest on the horizon that we can clutch and quantify greater, but it is only a piece of it and we are working on all of these things, not a single silver bullet, but really, silver buckshot.

Mr. GONZALEZ. And my time is up. Thank you very much and I yield back the 10 seconds.

Mr. MELANCON [presiding]. Thank you, Mr. Gonzalez. Mr. Upton for 8 minutes.

Mr. UPTON. Thank you, Mr. Chairman, and Mr. Meyers, welcome back to the committee. It is good to see you. I have a truck engine research facility, Eaton, in my district in Michigan, and they have done just some marvelous work on redesigning diesel engines so that they don't have to idle, so whether it is a UPS truck making deliveries or trucks making repairs on the telephone poles and truckers idling at night as they pull over; they don't have to turn on their engines with the new techniques and I would love to get you or the administrator out sometime this summer to look at what they are doing. I may submit a question, for the record, in terms of some of the difficulties that they are having, but it really is advanced and they think they can save millions of gallons, as we look down the road and you all, I think, have been helpful, but I would love to let you kick the tires a little bit. I have driven some of the trucks around and it would be great to have you come out—

Mr. MEYERS. I would happy to accommodate your request.

Mr. UPTON. I have cosponsored the legislation that is being submitted by Mr. Boucher and Mr. Shimkus which includes carbon sequestration. And with that carbon sequestration there is some pretty good evidence that harmful emissions are actually, maybe even lower than current fuels. I think the statistics show it is nearly

above it. It can show that, in fact, the emissions are less than today and I am just curious to know, as we look to move this legislation forward, where are we in terms of an update in terms of regulations as it relates to carbon sequestration under the Safe Drinking Water Act?

Mr. MEYERS. Well, Mr. Upton, I am with the Office of Air and Radiation, so I wouldn't speak exactly to where we are with regard to safe drinking water regulations, but we have been working on that issue and the Office of Water and I would like for them to submit more information, but we worked on guidance for experimental wells that should allow basic R&D work that is necessary for carbon sequestration to move forward. There are longer-term issues in the UIC program, the Underground Injection Control program—to address those longer term—but we are moving forward, as an agency, on this issue.

Mr. UPTON. Great. Maybe you can provide something for the record or a comment. I look forward to seeing it. Mr. Karsner, we all want to help the auto industry, we all want more fuel efficient vehicles and a number of us are concerned about unfunded mandates in terms of how we get there. I was a supporter of this last year, of getting the chairman of the big three, actually even more than that, to come down and meet with the President.

If you will remember, even recently, they had a number of the vehicles out on the south lawn and I thought we were well on the way to seeing pretty decent funding for the Advanced Battery Consortium project and as I saw those numbers last November, they were asking for about \$100 million for that fund. And I was very surprised to see, in the President's budget, that they didn't ask for \$100 million, which I thought that he had signed off on, but it was only \$11 million in terms of the President's budget as it was submitted.

I just wonder if you might comment on that in terms of where the administration is as we look to fulfilling that goal.

Mr. KARSNER. Yes, sir. I am not sure what component you were looking at for 11. It is a little bit tricky the way that we have reorganized, in the budgetary lines, the way hybrids, electrification and plug-ins have been characterized, but I am quite sure it is more than 11. I would be happy to report back for the record what those numbers are.

Mr. UPTON. Is it a lot more than 11?

Mr. KARSNER. It was more than doubling from the previous year, let me say that, and the substantial delta between what the automakers had proposed and what the national program is, is really, to a large degree, learning, demonstration and early deployment and manufacturing studies. So we are in general agreement. In fact, we work very closely with the automakers through our FreedomCAR and Fuel Partnership and are integrating plug-in and electrification technologies alongside of the existing hydrogen program.

But we are working out the details and approaches to how we might work together with regard to manufacturing and demonstrations. We think it is very important that we don't over-invest in demonstrations that are very far ahead of their time and focus more exclusively on concept cars rather than cars that can be

placed in people's garages. And so there isn't a big difference on the scope and direction, but maybe on some of the details of the program. But we are very enthusiastic about working together on battery technology.

Mr. UPTON. Mr. Doyle and I have introduced legislation that would require a 10 percent mandate on ethanol, very much along the lines of what some States have done. Minnesota has always been a real leader in that effort. Where is our delivery system, our pipeline system, in terms of being able to meet such an increase in renewable fuels mandate? Are they capable of doing that or is the Department looking at what stress or corrosion might be there? Where are we in terms of studying the current infrastructure and what needs to be done—

Mr. KARSNER. It is a great question and an essential part of the puzzle, is the delivery and transportation infrastructure from the facilities into wholesale and retail delivery systems. It is predominantly the domain of the Department of Transportation, but I am please to report that we have worked very closely with them. We recently had an off-site with the senior leaders, Deputy Secretary Admiral Barrett, and are going to work together on a program together on the issue of pipeline delivery systems. But as you know, ethanol is not particularly conducive to sharing that pipe, because of the water issues, with other fuel sources and that makes it a bit more difficult and challenging than future alcohols like bio-butanol, for example. But it is our understanding that the pipeline industry is very keen and interested in getting into more exclusive investment of ethanol dedicated pipelines.

Mr. UPTON. Thank you. I yield back.

Mr. MELANCON. Thank you, Mr. Upton. Next, Mr. Inslee for 8 minutes.

Mr. INSLEE. Thank you. We were talking about the need to accelerate getting E-85 pumps in for consumers so we have a choice and I would offer one step forward. Today I will be introducing the Federal Low Carbon Fuels Act, myself and several other of my colleagues, that will basically set up a requirement that our fuels meet certain standards for reducing carbon dioxide emissions from their combustion and we think this is absolutely imperative if we are going to meet our national goal of reducing the threat of global warming, by increasing the efficiency of the reduction of CO² from our various fuels and I believe it is necessary to have such a standard in addition to an RFS, because we are going to have so many different types of fuels, including electricity, and which is one of the things that gets credit in my bill.

This is an approach that I hope you will give some thought to because one of the things we want to do is allow coal to be burned cleanly, the CO² sequestered, then the electricity can go through the wires through our garages into our plug-in vehicles and the coal fire-fired utilities would be able to earn credits under this standard. Here is a way to incorporate clean coal into our transportation sector in a way that reduces CO², rather than increases it if you don't sequester the carbon and coal-to-liquid system or make it no better, marginally better, perhaps 2 percent better.

This is a way to use electricity and get it into our standard. So I guess I hope that you will give some thought to this and we

would like your input, of course, after you have had a chance to take a look at the bill. This is an approach that is starting to be used in California and Europe and the bipartisan National Commission on Energy Policy have suggested a low carbon fuel standard in that regard. So what are your thoughts about this idea, that we should be integrating electricity into our consideration of fuels? Have you thought about that? Is that in any of your plans at all?

Mr. MEYERS. Well, within the AFS legislation that was submitted, electricity is a qualified fuel, so within the President's bill, electricity could participate in the AFS system.

Mr. INSLEE. Now, my understanding, my concern of your proposal for an alternative fuels, my reading of it, it goes backwards on a CO² or a global warming provision. And the reason I say that is, in the original RFS, you essentially have most all the fuels are going to have some CO² benefits to them. But then what you essentially opened the door and you said now we are going to give credits to these non-CO² reducing fuels. You essentially go backwards from the step forward we took to move forward on CO² reduction. How can we think other than it is a step backwards when it comes to CO² reduction?

Mr. MEYERS. Well, Congressman, I think first you have to look at the types of fuels that are in the AFS and if you go down the list through cellulosic ethanol, biodiesel, electricity, gaseous hybrids and compressed natural gas, liquefied natural gas, corn ethanol, liquid bio-petroleum gas, methanol, they are all positive—according to our most recent estimates. With respect to CTL, I certainly would acknowledge the issue of carbon emissions from CTL. I think that is something that is well known. We have analyzed that, also, and our figures are with carbon sequestration—so you have a small increase—

Mr. INSLEE. What size?

Mr. MEYERS. 3.7 percent.

Mr. INSLEE. Do you consider that less than small? We certainly do. We have to get an 80 percent reduction of CO² by the year 2050. Three percent is nothing. I guess I am going to ask you this question. If we are serious, if we are serious in this country about getting to an 80 percent reduction of CO² by 2050, are you seriously suggesting that a 3 percent reduction, starting a whole industry—instead of going to a technology that can reduce it, which is ethanol or electricity, burning coal cleanly, creating electricity, putting it in our cars, using coal in a clean way that reduces our CO² somewhere between 45 and 90 percent, depending on how you count, wouldn't you think that the preferable way is to use coal if we want to reduce CO² emissions?

Mr. MEYERS. I didn't mean to suggest it was a small increase. What I meant to suggest was our currently analysis and the assumptions projected that percentage increase. Under different sets of assumptions, higher carbon capture rates, it might be possible for CTL to be actually negative. Regardless of that, the other aspect of this is in terms of where the fuel will be used. If you assume a CTL production which produces a very high quality diesel, when diesel is used in the market, it expands the diesel market. Diesel engines inherently are more efficient. So it depends on how

you approach the issue—how you look at the mix of the fuels that are used in transportation—

Mr. INSLEE. Well, let me just ask you about coal. To me, we have two opportunities in coal. One is to burn it in combined cycle plants, sequester the CO₂, run the energy through our lines into our garages, put it into our plug-in cars, run them for 40 miles at 1 cent a mile—it costs 9 cents for gas today—1 cent a mile. After 40 miles you use ethanol or gas after that. If you use coal in that way, which my bill would suggest we should, you can reduce your net life cycle CO₂ emissions by somewhere between 45 and 90 percent, depending on what else you burn with the electricity.

The alternative way to use coal is to make it into a liquid. If you don't sequester it, you increase CO₂ 118 percent. If you do sequester it under the scenario you suggested, maybe we can reduce it by 3 percent. Which of those alternatives would be preferable to reduce our global warming gases? In your opinion.

Mr. MEYERS. Well, Congressman, it accommodates both. And exactly what you just described—

Mr. INSLEE. I would like to direct you to my question. Which of those two approaches do you think would be better if we have to solve global warming?

Mr. MEYERS. Congressman, I think the approach to global warming is a complicated issue in terms of the variety of inputs—

Mr. INSLEE. Let me ask you a different question. If one way of using coal will reduce CO₂ by 45 to 90 percent and one way of using coal will reduce it by 3 percent in the best case scenario, how could you conclude other than that the better way to use coal is by turning it into electricity cleanly in running our plug-in hybrids? How could you conclude anything but that?

Mr. MEYERS. Under the parameters of just looking at emissions, you might make that conclusion. However, I think the issue of climate change has an economic component to it. What is unstated here is the economics of each avenue. I can't present you with analysis right now what the economic tradeoffs would be in each avenue of supplying the market. The one thing the AFS tries to do is not pick winners and losers on the economic marketplace and to that extent, we strove for economic efficiency in the proposal. But I am not trying to avoid your question. Obviously, if one method produces less GHG per gallon per mile, that, on the emissions standpoint, is something that has better a profile than one that doesn't. But the issue of climate change and how to approach it is much more complicated than just the emissions. You have to look at the—

Mr. INSLEE. I appreciate your time, gentlemen. We are going to try to get you more R&D dollars. We have had a 65 percent reduction in your R&D dollars since 1979. We are going to try to do better for you. It is ridiculous when we have this existential threat to be cutting your R&D budget. Thank you.

Mr. MELANCON. Thank you, Mr. Inslee. Mr. Barton up to 5 minutes.

Mr. BARTON. Thank you, Mr. Chairman. It is always good to see our two witnesses here, one who used to be counsel to the committee and the other, who is doing a good job in the Department of Energy.

Before I get into questions, I want to make a statement about something that is not material to this hearing, but I think is material to this Congress. Dr. Michael Burgess, who is a member of this committee, told me, when I walked in this morning that he had an appointment just last evening at 4 o'clock to look at the Intelligence bill, which is supposed to be on the floor later this week and that when he got over to the Intelligence Committee for his scheduled appointment, he was told by a majority staff person that he couldn't look at the bill.

Now, to me that is an outrage. We ought to be able, especially bills that are scheduled to be on the floor, if you take the time to make an appointment—now obviously, an Intelligence bill is a little bit different breed of cat than just a run-of-the-mill bill, but a Member of Congress in good standing who has an appointment should be able to look at the bill. And I am going to take this up with the chairman of this committee, who is a man of honor and integrity, Mr. Dingell, and then if need be, I am going to ask for a meeting with the Speaker, but I just think it is an outrage that this new majority that talked about openness and operated on a different plane won't let a member of the minority take the time to go and have an appointment and actually read a bill, to me it is just an abomination and I wanted to—that is not the purpose of this hearing, but I want to put that on the record.

With regard to this hearing, Mr. Boucher is not here, but this is a good hearing and something that obviously we need to work together on. I would ask the gentleman from the Department of Energy what the prospects are of having technology that is actually commercially implementable for cellulosic ethanol and how soon we could hope to have that technology?

Mr. KARSNER. Thank you, Congressman. We take the view that there is a need for a technological breakthrough right now for cellulosic ethanol in the applied science, research and development portfolio, where we sit, we are actually working more on standing it up to be commercial and have a very specific timetable for that by 2012 and so our focus is on process integration and coming up with the commercial paradigms that will regularly attract positive returns for the investors in facilities that can scale at a timeframe that matters. But 2012 is what we are looking to for that.

Mr. BARTON. What is the chief impediment right now to the scale of the commercialization? What is it that they haven't figured out?

Mr. KARSNER. I think right now it is the capital cost. Fundamentally, the capital cost is about three times what conventional ethanol is and that is because each of these is a one-of-a-kind process that we are standing up. We know how to convert, through biochemical and thermo-chemical platforms into cellulosic ethanol, but each time you do it, it is standing up an experiment. That is why we have these two separate solicitations brought to 16 facilities that will give us a diversification of risk to try and lower that capital cost which the taxpayer is sharing on these first ones, so that we can reliably replicate these.

Mr. BARTON. Well, what is your expected best case learning curve to get the cost down? Do you expect to get it comparable to current cost for corn-based ethanol?

Mr. KARSNER. Yes, we do. It is about a third higher right now, based on both operational and installed cost and our goal is to get it to a parity with conventional ethanol, \$1.31, by 2012.

Mr. BARTON. OK. And Mr. Meyers, I listened, with great interest, to your answers to my good friend, Congressman Inslee. You obviously didn't need any help in answering his questions, but I would like to know, in a similar vein, why the Bush administration feels like its alternative fuel standard, which does not pick winners and losers, as you correctly pointed out, why you believe, as the spokesman from EPA, that that is a better approach than some of things that Mr. Inslee was talking about?

Mr. MEYERS. Congressman Barton, I want to be careful that the administration has not reviewed Mr. Inslee's legislation nor taken a position on the legislation.

Mr. BARTON. I am not accusing you at this point. Jay may, but I am not.

Mr. MEYERS. With respect to the AFS and the AFS question, I think what the administration did was adopt what Congress provided as a structure in the RFS. In the RFS, Congress provided an increased mandate, provided for a cap-and-trade system, but did not specifically say exactly what fuels were used.

Mr. BARTON. You actually helped put that together, as I recall.

Mr. MEYERS. I had some role.

Mr. BARTON. You did.

Mr. MEYERS. But in any event, the fuels effectively in the RFS compete in the marketplace. If cellulosic becomes more cost-dependent because of some reason, some feedstock or some breakthrough, some technology side and you can sell it for less than corn ethanol, it is going to win the race and vice versa for all of the other types of fuels that qualify—bio-butanol and different fuels. If they can compete, you measure them on a BTU value and energy content value, which is a good approximation of petroleum displacement. If they can sell it for less, they win. We adopted that structure in the AFS, where the marketplace really drives the selection of fuels and we did not adopt a segregated market where we would have individual mandates or sub-mandates within the overall mandate.

Mr. BARTON. Thank you. And thank you, Mr. Chairman, for extra time.

Mr. MELANCON. You are quite welcome. Ms. Hooley, 5 minutes.

Ms. HOOLEY. Thank you, Mr. Chair. I am going to start out with Mr. Meyers. If you had to put together an energy independence program and taking into account, also, trying to do something about global climate change, what would that energy independent program look like, what is the mixture that you see and what areas would you put additional research dollars into?

Mr. MEYERS. Congresswoman, I am not going to be able to answer the entirety of your question because my role with EPA does not cover all the energy issues. We certainly have a greater role in looking at the environmental impacts of energy production and use and that is the role we play within the Federal Government. But my first suggestion was just those type of concerns were what led the administration to try to take a very hard target of 20 percent reduction in gasoline consumption off of projected use in 2017 and

then try and put together a structure of policies that would get us to make that goal.

I think the obvious answer to all the problems we have with energy dependence over several decades is a complicated problem requiring complicated solutions across a variety of these economic sectors. In the transportation sector, measuring it as a 20 percent gasoline consumption reduction, we consider it to be aggressive, but we thought it was a target which could lead to some very positive results for the economy and for the development of environmental fuels.

Ms. HOOLEY. Mr. Karsner, do you want to take a stab at that question? What would it look like?

Mr. KARSNER. What would it look like? As I mentioned to the chairman, you cannot isolate exclusively the question of technology away from policy and away from capital markets. We tend to focus almost exclusively on the cultivation of technologies when, in fact, most of the technologies that would increasingly liberate us from our dependencies or from greenhouse gas emissions are readily available, but they have insufficient policy that is insufficiently durable with not enough longevity predictability or capital formation to occur at a rate that matters. And so I would throw all of my focus on doing what is necessary to offer those technologies and technology providers preferential access to markets and preferential access to capital rather than continuously focus on the silver bullet nature of one technology over another or its intrinsic characteristics.

Ms. HOOLEY. I know, that as we look at alternative fuels, that you have to have a market for it and you have to have capital for it. What is going to cause someone to invest in alternative energy? What is it going to take to get the capital to get the markets for some of these alternatives?

Mr. KARSNER. Well, the simplest answer, putting on my business hat, would be a higher rate of return that is predictable over a longer period of time. And right now there are great returns in the alternative energy space and that is why you are having a substantial aggregation of capital. But people wonder does that mean is it in the seventh inning, is it in the eighth inning? Is this a boom and bust? What kind of policies can we put in place to reliably see these returns over a much more protracted period? So there is no question you can get the returns that make capital flow in that direction, but to make them flow greater, which I think is the essence of your question, you need the policies that will sustain those market conditions. There is a lot in the Energy Policy Act that can help that.

Ms. HOOLEY. When you talk about sustaining that policy, what kind of timeline are we talking about?

Mr. KARSNER. Well, I think it is until it is done. Depending on how you define energy independence or reduced greenhouse gas emissions or economic competitiveness, the Nation should have certain measures. That is what really the President's policy seeks to do is give us a top line objective of 20 percent gasoline reduction within a decade, so we have a metric in timeframe and a metric in size and scope, and so it is not too much of us to focus, as a Nation, for a decade period. I would suggest that it is a reasonable

timeframe. That is how most companies measure their long-term net present value.

Ms. HOOLEY. Thank you. My time is up.

Mr. MELANCON. Thank you, Ms. Hooley. Mr. Shimkus from Illinois.

Mr. SHIMKUS. Thank you, Mr. Chairman. I appreciate the panel being here and I think one of the big things that I think we are moving to is diversity in the transportation mix, whether that is an RFS, alternative fuels, plug-in hybrids and the like, that is the way our electricity generation today, that helps mitigate the big swings that you see and I think helps long-range cost projection, so there is a lot of great discussions back and forth, but I wanted to key on some of the comments.

First of all, I just want to make a point. In the commodity markets there is always boom and bust. And to my friend from Texas, Mr. Gonzalez, we both have been here about 10 years. I remember when a barrel of crude oil was \$10 a barrel and I was worried, you were probably worried about our marginal oil wells that were being capped because it cost more money to get the oil out of the ground than you got on return. And now it is at \$60, six-fold increase in 10 years. So it is always funny to hear folks worry about corn.

Ten years ago, corn was at \$2 a bushel. It is at \$4 now. Farmers are pretty resilient. They are used to boom and bust. I would like to unanimous consent to submit this article into the record from the AP. Basically, a couple issues.

Corn prices had hovered around \$2 a bushel for a decade, have nearly doubled in the last year due to ethanol demand. But others say prices could sink back to \$2 a bushel with a record crop and could top \$5 a bushel if there is a drought. We don't know what the price of a bushel of corn will be. They are planting record acres, but they also have yield. Bio-technology has been made great strides. So I don't underestimate the ability of the American farmer to produce to meet our Nation's demands both on food and fuel and I think they are going to be up to the task. I am very excited about the cellulosic debate, also, and of lot of this AFS, Alternative Fuel Standard, is predicated on the breakthrough on cellulose.

The first question I would like to ask is, because you said, Mr. Karsner, a couple times, it is dependent upon the policy environment initiated, so for us to do that, what should be the policy? That is what Chairman Boucher is really asking, as we move forward to move an energy bill. What else can we do? What policy initiatives do we need to take in this to obviously incentive-ize in this AFS and the cellulosic debate?

Mr. KARSNER. Well, the easy answer would be the President's policy, of course. The why is timeframe, size and scope. It is very important that we move beyond the aspirational and the rhetorical when we talk about energy dependencies and greenhouse gas emissions. We have got to, if we want to deal with this with urgency, put a timeframe to bear that is measurable and even in the Department, we have typically sort of looked at 30 percent within 30 years and the rate of technology flow over too long of a time frame can also throw us askew if you think of what the technologies were 30 years ago. A Princess phone was a technological breakthrough. So a 10-year timeframe, for the Nation to wrap itself around, with

a very specific metric; in this case, the most ambitious in size and scope that we have yet asked for with force of law, is what the President is putting out.

Mr. SHIMKUS. Because we need refineries, cellulosic refineries built. Now, we were fortunate to have testimony from a company from Ottawa, Canada that has a pilot plant. He testified driving on E-85, based upon cellulosic to the airport to get here, but this is very similar to the coal-to-liquid debate. When Chairman Boucher and I dropped a bill today, it is intended to incentive-ize the first six refineries because that is the breakthrough, once you have it. Let me ask it this way. Either one can answer. What locomotive engines can be used in plug-in hybrid technology right now? Do you know of any, Mr. Karsner?

Mr. KARSNER. We don't really have locomotives in our program, so—

Mr. SHIMKUS. OK, how about aviation? How about planes? Do we have any planes that can fly on electricity, plug-in hybrid technology?

Mr. KARSNER. I am now aware of any.

Mr. SHIMKUS. What about our major oceangoing vessels? Can they use plug-in hybrid technology?

Mr. KARSNER. Again, it is out of my scope.

Mr. SHIMKUS. In Illinois, the great Mississippi River is a great transportation means to get our crops to the Port of New Orleans and of course, we have great barges run by boats that push these automobiles for 40 miles. But you are not going to do interstate transportation of 16-wheelers with plug-in hybrid technology. So I want to encourage him to join with us. This doesn't have to be a zero-sum game. I continue debate. This is a debate on supply. The more supply we have with different alternatives, the more competitive markets, the lower prices and our economy survives, especially in this carbon climate debate we are having here. Why not give the benefit to coal-to-liquid, on carbon dioxide, and why not give the benefits of electricity generation on coal-to-liquid by using this new technology and then sequestering it. Wouldn't that be a win-win for all of us?

Mr. KARSNER. Do you want to take that, Bob?

Mr. MEYERS. I think the AFS was structured to, as I think, referenced before, not pick the winners and losers in the fuel debate, so I think that allows the longer-term competition. The other thing about the AFS is that we provide a 10-year schedule can help drive market expectations in the longer term. Right now the RFS is limited at 0.12 and beyond that there is an administrative process to figure each year, or a series of years after that, what the landscape is going to look like. That is something that is hard to predict now in 2007.

Mr. SHIMKUS. Can't we say that the RFS that we passed in the EPAct is very successful and really exciting to the renewable fuel industry?

Mr. MEYERS. I think experience has borne that out and in the testimony on the second panel, from Mr. Dinneen and others, references the large amount of investment that has occurred.

Mr. SHIMKUS. Yes. And that is something we should take pride in and I think that is why there is really a bipartisan movement

to really ramp it up. I think we have to be cautious and as we bring more fuels or venues to the bay, I do think we can get to a higher standard if we don't try to. I yield back.

Mr. BOUCHER. Thank you, Mr. Shimkus. We appreciate it, Mr. Karsner. Thank you for reminding me about the Princess phone. I had long forgotten. I think I have got Ms. Baldwin for 5 minutes.

Ms. BALDWIN. Thank you, Mr. Chairman. Secretary Karsner, both the Congress and the President are considering the adoption of very ambitious goals for ethanol production and use in the coming years. Based on reports from my constituents, and articles reported in the media, I have become very concerned about whether the infrastructure is or will be in place to move significant amounts of ethanol to our refinery and population centers in the United States. Since today we cannot use pipelines to move ethanol, we are dependent upon rail, truck and barge for transportation and given the location of the many of Nation's ethanol production facilities, rail is today the primary means of transportation of most of our Nation's ethanol. I have been very concerned about rail bottlenecks that are a problem and that rail system constraints may continue to be a problem for some time to come. In fact, I have introduced, along with several of my colleagues, legislation to address this issue. I wonder what your thoughts are on the adequacy of our rail system to move ethanol.

Mr. KARSNER. Congresswoman, it is a valid concern. Again, in our shop where we deal primarily with conversion platforms, we haven't deal specifically with that, but like you, we are aware of that constraint and it is pending nature to potentially become a bottleneck. We know that the shippers are concerned and so for that reason, as I said, we recently convened with the Department of Transportation and for the first time the administration has really convened, at the presidential appointee level and above, an interagency biofuels R&D board to take these holistic views at the supply chain management of ethanol as we grow the system, and biofuels in general.

And again, of course, I think coal is somewhere in the area of 70 percent of all rail transport and so you have a competitive situation there of a burgeoning 300-percent growth rate in ethanol that we currently see, what our aspirations and what our mandate may be that imminently will bump up against that. And so I know the Department of Energy were also looking at ways to move that coal instead by wire with—clean coal carbon capture and storage and production in the Powder River Basin, by way of example. So the more of that you can alleviate by transmission modernization, you will allow for some additional rail capacity. But it is an issue and we would be happy to work with your office to explore that more.

Ms. BALDWIN. Great. Thank you. And you hinted at the answer to my second question, in terms of the formation of this task force. But do you think the Department has, currently, sufficient information on this issue, to avoid rail infrastructure constraints due to the movement of ethanol at this time?

Mr. KARSNER. Well, I am sort of the school that you can never have too much information and so it is predominantly the domain of the Department of Transportation. We are intrigued enough and interested enough that we are reaching out to them and saying we

have to collaborate on this issue, and we have had a very cooperative effort, so there can always be more.

Ms. BALDWIN. Thank you. One of our witnesses, who will be testifying on panel II, indicated in his written testimony, this is Mr. Reid, that E-85 faces challenges in gaining popularity in the marketplace, primarily because it suffers from the chicken and egg factor. Does E-85 face roadblocks because of the relatively small number of flex-fuel vehicles, or because E-85's availability is still relatively limited? In encouraging the use of E-85, government fleets can set a real example for communities. They can help educate the public about environmentally friendly options that are available and they can create access to fueling stations that might not otherwise be available. What is the Department of Energy doing to encourage government entities, at the Federal State and local levels, to make investments in flex-fuel vehicles and E-85 stations?

Mr. KARSNER. Well, specifically, I have a program in my office called the Federal Energy Management Program. That has responsibility for compliance and reporting of the executive orders. And the President, of course, has just issued an executive order on this subject, as well as building efficiency, that succeeded the previous Clinton era executive order that we had been seeking compliance with and I am proud to tell you that the Federal Government exceeds its compliance requirements for flexible fuel vehicle procurement across the board. And so to the extent that we are doing that, we have meant to be a model. That has been in legislation for some time. It is not proving to be enough to move the market. We will continue to be in compliance and exceed compliance, but it will not, in and of itself, resolve that chicken and egg dilemma that you spoke of.

Ms. BALDWIN. Well, how can farmers provide assistance to your agency to spur additional support for these vehicles and E-85 stations within governmental entities and beyond the Federal level?

Mr. KARSNER. It really needs to go well beyond the Federal level because of the critical mass. It matters how much a person has to look for E-85 before they say, well, I want this to be part of my life, let alone before you get to price parity. We have 170,000-plus gas stations in this country. We have 1,200 as of yesterday that are E-85 capable. At the current record clip, it would take more than a hundred years to get to a third of gas stations. So unless the majors decide that they want to bring this on board underneath their canopies and part of their fuel mix, it is unlikely that E-85 will make a significant dent in the future at the current rate and scale of it, even though we are moving at a record clip. The car companies will tell you that it is the oil companies and the oil companies will tell you it is the car companies; that is the chicken and egg. The truth is we need to understand whether or not we need further policy stimulus to encourage us to break out of that situation.

Ms. BALDWIN. But if local governments, universities and State governments were investing in—

Mr. KARSNER. All insufficient relative to the magnitude and the scale that is required for E-85 to be a substantial, competitive end-use product, which is something that we desire for it to be, commercially available across the Nation.

Ms. BALDWIN. Mr. Meyers, you had a comment on that?

Mr. MEYERS. I briefly mentioned in my opening statement regarding EPA's SmartWay Program and we have used this program very successfully to work on public private partnerships to encourage use of energy-saving technology in the transportation sector. Recently last year we expanded that partnership to the Grow and Go Program, which works with the transportation industry. We are focus on corridors and we are focused on users and we are trying to—we have goals of the 20 and 50-percent commitment to expand use through that marketplace of E-85 and try to get the chicken and egg program from that angle. Thank you.

Mr. BOUCHER. Thank you. Mr. Walden for 8 minutes.

Mr. WALDEN. Thank you very much, Mr. Chairman. During the 2 weeks that we weren't in session here, I spent most if of it traveling around my district looking at potential facilities, either under construction or already developed or planned for various production compatibilities for ethanol and other biofuels, and there were some issues that came to light during that period that I would like your guidance on and your comments on. One, when it comes to ethanol itself, made from corn, what do you do with the distillers grain that is left over, both either wet or dry? My understanding is, if you leave it wet, there is less energy consumed in the production of the ethanol, but you have to feed it to somebody, cows, pretty quickly or it begins to distill.

But I was amazed at the volume of distillers grain that was left and so if you can address that issue, as well as, then, I met in Pendleton, Oregon, grain growers. They have been analyzing and putting together a facility that would make agri-biodiesel out of canola or other plant seeds and yet to do—I am told, to do 100 million gallons of agri-biodiesel, you would need a million acres to grow the canola. You would end up with a million gallons of glycerin as a byproduct and enough distillers grain left over that you would have to have 570,000 head of cattle to feed it to and you would have to supplement that with some sort of starch and protein to make up for what is taken out. But there are these unintended consequences, not to mention the price of corn and wheat that is going up as well, which I will get into next. But as you analyze the drive toward these alternative fuels, which I support like you do, what are we going to do with byproducts that are out there? Who is doing that analysis?

Mr. KARSNER. My quick answer would be we are going to profit from it, but I think that the question of how you profit from it, I will not be in as good a position as Bob Dinneen, on the next panel, to comment on, mainly because we focus almost exclusively on cellulosic ethanol rather than the conventional paradigms today. But I know that there is a substantial market for DBG as animal feed and byproducts on cellulosic ethanol is something that we are encouraging. We would like to have an integrated bio-refinery with multiple byproducts to allow for profitable income streams to those facilities.

Mr. WALDEN. But I think the market, and I will look forward to the testimony from the next panel, but the market for that distillers grain is somewhat limited in some regions of the country, in terms of we don't necessarily have huge feedlots out in the west,

in some parts like my district. Mr. Meyers, did you have a comment?

Mr. MEYERS. I couldn't comment specifically on your district and the distillers grain marketplace. There is general, though, my understanding from several sources, in terms of utilizing more of the corn plant in the process, and I think that is referenced in the testimony of the second panel. Instead of using some of the stalks, some of the product—with the corn, that may be the next incremental step here to using more of that resource, the advantages obviously being we already have the transportation structure involved and the plants are already located. But I think I would agree with Mr. Karsner, that the specific market conditions are best addressed through the private panel.

Mr. WALDEN. All right. I would just—for you that, in some regions of the country, this may not be as good a solution as others, even though we are all trying to become more energy independent and with less emissions. Let me give you one anecdote as well. When I was down in the southern part of my district, a cattle rancher, when I raised the issue of ethanol, said let me tell you what ethanol has meant to me: a hundred thousand dollar higher feed bill to finish my herd. There are these unintended consequences that I think this committee needs to be aware of.

Second, I have done a lot of work over the years in the Congress on forestry issues and the cellulosic research that is going on holds great promise for using woody biomass, which would help us reduce the fire threat in our forests, which, as you know, may burn a lot of greenhouse gases among other pollutants out there. Tell me about what efforts you are undertaking that would specifically utilize woody biomass out of the Nation's forests?

Mr. KARSNER. Well, I completely agree with you. Woody biomass, wood chips, urban wood waste and forestry residue we see as a primary pathway and many believe will be the predominate pathway for cellulosic ethanol and so we have sought as much diversification as we can in those pilot facilities that we have stood up and included that as an attractive pathway. It is a feedstock that we regularly run through our integrated bio-refinery facility at Golden, Colorado, to test its characteristics for output, but we are very optimistic about its prospects and potential to be a major contributor.

Mr. WALDEN. One of the issues I have run into in some areas that I chaired last Congress, when it comes to the use of woody biomass for alternative fuel is the lack of ability in the west to get a long-term commitment of supply out of the Federal Forest Service, which is where most of the forestlands are, sufficient to justify to the investors a certainty level to cause them to invest in the facility, and the 10-year stewardship contracts are inadequate and that there really needs to be some longer-term commitment in order to both do the cleanup we need to do in the forest as well as provide feedstock to justify the investment in these facilities. I realize the Forest Service isn't necessarily in your purview, but as we work toward these alternative energy sources, this certainly is a problem we need to address. Do you have any comment on that, either one of you?

Mr. KARSNER. Yes, I would comment. I was a little bit in neglect with my comment to Chairman Barton, indicating that capital cost

was almost the exclusive factor. Feedstock management utilization predictability is going to be another very specific gating factor to the commercialization of cellulosic ethanol. And again, if I put on a developer's hat, I would say, obviously the longer-term contract that would be available for predictability of supply and allowing me to invest in management systems of that feedstock, the better off we will be in terms of standing up a commercial cellulosic industry in general.

Mr. WALDEN. Mr. Meyers, do you have any comments?

Mr. MEYERS. I wouldn't have any further comment on it.

Mr. WALDEN. Then, finally, let me ask you this. If we implemented fully the President's recommendations regarding these alternative fuel sources, what percent of our fuel consumption would that amount to? What we consume today in fossil fuels, if we were to add this to the mix, what percent would we get to in ethanol cellulosic? I have heard it is very small percentage. Even if we did everything we are proposing today, it still amounts to a fairly small percentage of what we consume in terms of fuel, is that correct?

Mr. KARSNER. I will let Bob take a hit at it. I think, if I understand your question correctly, what percentage of gasoline are we displacing with the alternatives, and that is specifically calculated to be 20 percent. So we are aiming for a reduction of 20 percent of our gasoline consumption by 2017 through the President's plan.

Mr. WALDEN. Does that include the E-85, because you have talked about the distribution issues there. Does that take into account the difficulty in achieving that?

Mr. MEYERS. That is the overall policy goal measure. It is a number—the 2017 projected E-88 gauge for gasoline consumption. In terms of allocation—5 percent was with regard to reform CAFE proposal, 15 percent with regard to fuels. So what we are talking about is reducing the projected level of gasoline consumption, through our AFS proposal, by 15 percent from what would have otherwise occurred in 2017. In terms of what fuel mix will be there, that is based on many considerations. We certainly believe E-85 will be part of the equation and as a higher blend, E-85 fuels have some distinct advantages in terms of levels of volatility and emissions. And also, further penetration of E-85 allows for better optimization with regard to the vehicles. But we haven't, again, sort of predicted or set out a real statement to the market saying this what E-85 will be in 2017.

Mr. BOUCHER. Thank you, Mr. Walden. The gentleman from Massachusetts, Mr. Markey, is recognized for 8 minutes.

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

Mr. Meyers, the administration has proposed adoption of an alternative fuel standard, mandating that 35 billion gallons of alternative fuels be used by 2017. According to the testimony submitted by the NRDC witnesses, who appear on our second panel, if half of this alternative fuels mandate were satisfied with coal-to-liquid fuels, our Nation's carbon dioxide emissions would be 175 million tons higher in 2017 than targeted by the administration. Why is the administration issuing an alternative fuels proposal that could make greenhouse pollution even worse?

Mr. MEYERS. Mr. Markey, I have not viewed the analysis behind the NRDC's testimony, although I did read it. There must be a

chain of assumptions there. One, I would think, perhaps, behind the number would be that the CTLs produced without carbon sequestration. I think our figures show that, without carbon sequestration, there is a very substantial increase of greenhouse gas emissions, but with carbon sequestration, that that is down into the range of comparability to ordinary diesel. Secondarily, one misunderstanding of the analysis in the NRDC's testimony, with respect to how we measure diesel and I think they look at us, in terms of our GHG analysis, as having measured relative gasoline, when actually we measured it relative to diesel itself. So again, I guess to return to my point, that increased diesel use and increased use of diesel equipment—

Mr. MARKEY. How substantial would greenhouse gas emissions be without carbon sequestration?

Mr. MEYERS. We predict that, comparing diesel to diesel, a 118 percent increase on the CTL without sequestration.

Mr. MARKEY. A 118 percent increase without carbon sequestration?

Mr. MEYERS. Right.

Mr. MARKEY. OK, thank you. So without sequestration, you could not do this and meet the greenhouse gas emission targets?

Mr. MEYERS. I am not sure what we meant by we can do exactly what.

Mr. MARKEY. I am saying wouldn't be wise to pose this as a greenhouse gas solution if there was no carbon sequestration which was in place?

Mr. MEYERS. I think that we are working on carbon sequestration with the Department of Energy. My understanding, in terms of the Air Force, look at CTLs, that they are looking at purchasing fuel that is derived from facilities with carbon sequestration.

Mr. MARKEY. What if it is not ready, what if carbon sequestration technology was not ready, would it be wise to proceed?

Mr. MEYERS. I think there are many factors with regard to CTL. One of the factors that I know has drawn a lot of support with respect to the energy balance and national security elements of CTL, those were part of the President's policy, as well as greenhouse gas emissions.

Mr. MARKEY. So you are saying that the administration reserves the option of moving forward with coal-to-liquids even if it increases by a hundred and eighteen percent greenhouse gas?

Mr. MEYERS. Congressman, we adopted the law that Congress passed in terms of defining alternative fuels. Congress right now defines alternative fuels as including carbon coal-to-liquids. That creates certain advantages for coal-to-liquids in the current marketplace established under law.

Mr. MARKEY. We are in a global warming debate as well. The NRDC testimony further argues that "even if coal-to-liquid synth-fuels fully deploy carbon capture and storage, fuel cycle greenhouse gas emissions from using these fuels will be somewhat worse than conventional gasoline, because the vehicle tailpipe emissions from liquid coal have the same carbon content as gasoline or diesel." And the "residual emissions from a liquid coal plant employing CCS still is somewhat higher than emissions from a petroleum refinery." Do you agree or disagree with that?

Mr. MEYERS. In employing carbon sequestration?

Mr. MARKEY. That is right.

Mr. MEYERS. I think that depends on the chain of assumptions that is involved. When we did our analysis, we assumed essentially a capture rate of about 85 percent from the CTL facility. I think you would have to compare that to what would be feasible in the petroleum refinery and also the indication is that, with regard to petroleum refineries, you would have to have a suitable geological repository and I am not sure if that exists for all petroleum refineries.

Mr. MARKEY. OK. So 15 percent is not captured, is that what you are saying?

Mr. MEYERS. I am saying I cannot give you a relative for a carbon in/carbon out number for petroleum refineries versus coal-to-liquids. I think it depends on the assumptions for each facility.

Mr. MARKEY. OK, I think it is important, though, that you submit for the record your assumptions based upon—

Mr. MEYERS. Sure. We would be happy to do that.

Mr. MARKEY. And then we can analyze it to understand what the administration's view on that is. See, the problem that I have is that I think, rather than focusing on that, I think that the administration should be focusing on the deployment of plug-in hybrids, which would actually allow coal and other forms of electrical generation to contribute to powering our Nation's cars and SUVs, but not with a double whammy of carbon emissions in the coal-to-liquids conversion process and then in the vehicle itself. You wind up actually complicating this problem, because clearly want to increase—the goal is to increase our ability to back out oil from overseas without increasing global warming, while at the same time decreasing the threat of global warming without increasing our dependence upon imported oil. So it has to fit within that formula and what you have here is something that goes outside the formula, but it seems to me to be unnecessary, since just the burning in traditional coal plants would help with the plug-in vehicle issue and help us to solve that problem.

Mr. Karsner, in Massachusetts there are 69,000 E-85 vehicles driving around, but we have one E-85 pump in Chelsea, so you can imagine how long that ride is for many people in Massachusetts, 69,000 people with vehicles to get over to that pump. How long does the DOE think it will take before there will be, say, 500 E-85 pumps in Massachusetts? Because within 5 or so years, we will have a half a million of these vehicles in our State. So how long before you think there will be 500 pumps in Massachusetts?

Mr. KARSNER. That is a very good question, Congressman Markey, and at risk of being redundant with some of my earlier answers, not focusing exclusively on Massachusetts, but the problem in general for the Nation.

Mr. MARKEY. No, just take Massachusetts. Give me some idea of the timeframe to have it be an effective system of delivery of E-85 to the pumps, with the hundreds of thousands of vehicles by that point in time to have access to it.

Mr. KARSNER. We have 170,000 gasoline stations nationwide. The Department estimates that we need not less than 50,000 for E-85 to reach critical mass.

Mr. MARKEY. What year is that?

Mr. KARSNER. At the current rate of growth, that is more than 100 years away.

Mr. MARKEY. So that is very helpful to me. Since most of the stations are now centered in the Midwest, we will probably be at the end of it out here in Massachusetts and as my constituents are purchasing these vehicles, they still won't have anyplace to go to purchase this wonderful fuel, and it is something we would encourage, but we need a system here, if we are going to do it, to make sure that these pumps are in place, and I think any plan has to be realistic in talking about that. And the final question is, do you agree with the number, that even if we planted 70 million acres, every one of the 70 million acres in which corn is grown in 2006 and it was used for ethanol, that it would only displace 12 percent of all the gasoline that we consume in the United States?

Mr. KARSNER. We don't focus at all on corn-based ethanol, almost exclusively on cellulosic, so I would have to report back to the record after consulting with colleagues at USDA on that.

Mr. BOUCHER. I thank you, Mr. Markey. The gentleman from Oklahoma, Mr. Sullivan, is recognized for 8 minutes.

Mr. SULLIVAN. Thank you, Mr. Chairman. And Mr. Meyers, currently, and you touched on this a little bit earlier, but currently the ethanol component of gasoline cannot exceed 10 percent. Why is this the limit for ethanol/gasoline blends? Why can't we have blends greater than 10 percent? And what problems do we encounter with regard to air quality and engine performance, et cetera?

Mr. MEYERS. Congressman, we are looking at those issues in the context of Minnesota's E-20 initiative. First of all, with regard to E-10, that is our level that we have historically have approved, as part of our fuel certification program, as the legal fuel in this country. Beyond E-10, and I think our experience has been overwhelmingly good, we have to experienced problems in terms of vehicle performance, et cetera. With regard to E-20, we have to look carefully at those issues with regard to what is in the incumbent fleet. Not only do we have look at cars, we also have to look at smaller engines, small mowers, other types of vehicles that fuel and would buy it from the gas station down the road. So we have to look at those types of issues. We are involved a cooperative process now with the industry, that is both the ethanol industry and the equipment manufacturers, we are looking at those issues and right now it is too preliminary to tell you exactly what our conclusion would be as to whether E20 would meet the test that is laid out in the Clean Air Act.

Mr. SULLIVAN. And Mr. Karsner—oh, go ahead.

Mr. KARSNER. I was just going to agree with our colleague. Of course, it is a multifaceted question and EPA would be the predominant agency to ultimately determine whether the emissions characteristics, et cetera, that would allow those limits. I just returned from Brazil where there is no blend at all in the Brazilian market that is less than E-22. So we, of course, are running through our vehicle technologies program to understand what higher intermediate blends may need to availability in the growth rate of ethanol and allowing for a more gradual rise in penetration of

the overall Nation's fuel mix without having to wait that hundred years.

Mr. SULLIVAN. And also, Mr. Karsner, can you take me through the supply chain, from feedstock to final consumer, for the average gallon of ethanol that is consumed today, please?

Mr. KARSNER. I probably couldn't do that question any justice because, as I said, the Department of Energy almost exclusively focuses on future energy, cellulosic ethanol, rather than the conventional ethanol industry, so we have very little nexus to it, so I am not in a good position. I could report back to the record and give you—

Mr. SULLIVAN. But basically the corn is harvested, it is trucked, it is taken to a plant or a terminal and all of that. What I am getting at is if ethanol could be shipped by pipeline, would the total cost to consumers be reduced, and how long would it take and how much would cost to establish an ethanol distribution system that utilizes pipelines? And maybe, if there are any drawbacks on pipelines, if you could touch on that?

Mr. KARSNER. Well, there are characteristics of the ethanol and its water absorption issues that affect its capacity to share that pipe with anything else but ethanol, and so that has been the primary dilemma.

Mr. SULLIVAN. Nothing can be shipped other than ethanol in the pipe?

Mr. KARSNER. I couldn't do this justice. It is the Department of Transportation domain. We have recently begun collaborating with them, exactly, to go through the supply chain issues and try to figure out, from our side, those skills that we have, what are the possibilities of blending bio-butanol, for example, that would allow for ethanol shipment more effectively. But it is my understanding today that you need dedicated pure ethanol pipeline facilities, because it can't easily share with other fuel sources.

Mr. SULLIVAN. But don't you think that will reduce the cost if we had some pipelines in place that we could ship it on?

Mr. KARSNER. It is my understanding that the pipeline industry is divided on that question. Many of them are ambitious to get into ethanol delivery by pipeline and many of them are staying away. I just don't have sufficient expertise on whether it would lower cost.

Mr. SULLIVAN. Well, thank you. I yield back the balance of my time.

Mr. BOUCHER. Thank you, Mr. Sullivan. The gentleman from Georgia, Mr. Barrow, is recognized for 8 minutes.

Mr. BARROW. Thank you, Mr. Chairman. At least in the area of transport energy, just the stuff we use to drive our trucks, our cars and our tractors around, it seems to me that we are dealing with a three-legged stool here. You have to got to have a supply of fuel, you have got to have an infrastructure to deliver it and you have got to have a supply of vehicles that can run on it. And so far, we have talked about, at least mostly today we are talking about what little we have gotten involved in this at the Federal level is to be fooling around with the level of supply of the fuel, and all kinds of questions arise in all of that. You all haven't got, for example, a formula as to how we can reach 35 billion gallons and told how

much of it is going to be corn, how much of it is going to be cellulosic, how much of it is going to be coal-to-liquids. We haven't got a plan for that. We haven't got a plan for the infrastructure, when we talk about the infrastructure.

One of you all testified earlier that we are assuming the infrastructure is going to be in place because the demand is going to be there down the road. It is a demand fixed by law and a demand fixed by the conditions that have gotten us where we want to be so far. You assume we are going to have the right mix of renewable fuels in the grid, if you will. We are assuming that is all going to be in response to Ms. Baldwin's question, it doesn't seem to me that the analogy of the chicken and egg does any justice to the situation. We don't have a chicken and egg problem, we have a chicken, we have a chicken feed, we have a henhouse, we have a rooster and an egg problem, at least, and that is not even dealing with the chicken hawks that are out there, that we will deal with with the next panel of witnesses. We are not even close to describing the problem.

So the question I have got is, who is running the store? Who is actually coordinating in the executive branch of government a plan to not only get us a supply of clean fuel, but an infrastructure that is capable of delivering it from the producers to the consumers and making sure that there is a supply of vehicles out there that will generate the demand for the fuel when it is there? Who is coordinating this? I heard one of you all saying that, earlier on—just the other day and I don't want to be sarcastic or anything, but do we need to talk to who conducted that, in order to find out what the plan is? I hear you when someone says, "what should we be doing?" You say, well, we are implementing the law as you pass it, Congressman. You make the laws and we are just carrying it out. We need a little guidance and a little leadership here and I want to know who is actually heading up the shop in the executive branch of government in trying to come up with a plan to make sure that we are not only going to have a supply of fuel, but an infrastructure that is capable of delivering it and a fleet of vehicles that is actually going to be needing it. Who is heading that up? Who wants to go first?

Mr. MEYERS. I will take it. I will take a crack. First of all, with regard to vehicles, most of the fuels we are talking about—E-85 has the E-85-capable vehicle, but the E-10 vehicle does not. Other fuels that are contemplated here, obviously are going to have some of the chicken and egg problem. Electric vehicles will have an introduction situation where they have to have consumer acceptance.

Mr. BARROW. Mr. Meyers, I want to make sure I have explained the problem, though, because here is the problem in a nutshell. We have got folks back in my district selling trucks and there is an ad that I hear when I ride around in my district. Are you tired of high fuel prices? Come on down the road and we have flex-fuel trucks you can buy. And they are selling flex-fuel vehicles in my district. There isn't any E-85 fuel for them to run on, so they are running on gas and the problem is summed up in that episode. How can we actually get the E-85 fuel that these trucks are selling—there is a demand, but that is an itch they can't scratch down there. That

is the problem. Could you help me understand what we are doing to get that problem solved?

Mr. MEYERS. There have been efforts. The Energy Policy Act provides tax incentives for infrastructure development for E-85 pumps.

Mr. BARROW. Well, is that enough?

Mr. MEYERS. I think, according to my colleagues testimony, there is a substantial way to go in terms of E-85 penetration under the current incentives that exist.

Mr. BARROW. So it is not enough?

Mr. MEYERS. Well, I don't feel qualified to give you an opinion on how much of a tax incentive—

Mr. BARROW. Well, if my friend down in Vidalia, Georgia is buying a flex-fuel truck and it is going to take a hundred years for us to get the 50,000 stations that can carry it so that E-85 can carry it on its own in that marketplace, I guess he is going to be a little long in the tooth before he can get the benefit of the extra money he is paying for a vehicle that can't run on nothing that is there.

Mr. MEYERS. That is correct, although the incremental price on E-85 vehicles now is not absorbent.

Mr. BARROW. Well, I am glad that he is not paying that much more for something he can't use. My point is he is still not getting what he needs and his problem, I can multiply that 300 million folks and describe the problem of this country in a nutshell. Now all I want to know is what effort is being made in the executive branch to develop a game plan? They cannot deal with this problem in just one part, one part of a three-legged stool, but is going to actually try and bring all the pieces together so that it is going to come in for—because right now, when I hear Mr. Karsner talking about the market conditions, they need to create access to markets and access to capital, with respect to the policy we have got right now, it sounds like what we are doing is we are lying on a train wreck to create the market conditions to deliver all of this other stuff. The train wreck is we have got one vital link in the chain, it is fuel supply, we haven't got any idea as to how we are going to get there and what mix is going to be in it, but that is the thing we are going to mandate and so far, that is the only thing we are mandating and everything else is going to have to get in line and respond to that market incentive and what I see coming is something that is not going to be deliverable at the time that is going to be needed and we are either going to extend or we are going to basically not get anywhere. I want to know how I answer the folks back home, about how we are coordinating our response to this problem.

Mr. KARSNER. Well, we have to do it together. We have greater coordination than ever before at the administration's level.

Mr. BARROW. Who is in charge of it?

Mr. KARSNER. Well, I co-chair with Under Secretary Dorr, at the U.S. Department of Agriculture, something called the Interagency Biofuels R&D Panel and so that involves the Department of Transportation, EPA—

Mr. BARROW. That is the fuel leg of the three-legged stool. How about the infrastructure and the vehicle?

Mr. KARSNER. And we are taking on all of those issues of supply chain on board, so feedstock, the transport to facilities. But I think your pointing to a very real problem, which is we are operating on legacy systems of organization of government that have emanated out of World War II and we have 21st century problems with urgency that we need to address by taking down stovepipes——

Mr. BARROW. And I am looking to you guys for leadership. What is the solution? How do we plan our way out of this?

Mr. KARSNER. Any plan has to got to take into account how you are going to cultivate the market, because we are a market-based economy. We are not a politburo, ultimately, so we don't have 5- and 10-year plans in that way. So the question is how do you change the way investments are done for returns into those products and services that we desire that are tantamount to the Nation's interests? And ultimately, if I am an executive and I have a fiduciary responsibility to my shareholders to profit, it is unlikely that I am going to rapidly take aboard products that compete with my base in order to——

Mr. BARROW. So if you won't create the market conditions that we want, how can we incentive-ize the players to invest in what we want to get at? If we wait for the money, the market will solve this problem. But I will tell you, my part of the country will dry up and blow away if we wait for the market to solve the problem in our part of the country the way it solved it down in Brazil. Well, we all drive long distances to do our work and to get to and from our jobs and just to get around and we are energy-dependent. If we wait for the market, the market will solve our problem, but I don't want it to be at the expense of my part of the country.

Mr. KARSNER. Or any part of the country. The bottom line is that what the President has sought to table and the conversation that we are now having with Congress on the legislation we hope that it will be returned to the President to sign, is significantly disruptive policy with enforcement by law. So it is more than disruptive technology, which has been our focus for a quarter of the century——

Mr. BARROW. It sounds to me, though, Mr. Karsner, and I apologize for interrupting, but my time is running out. Sorry you had to stop. It sounds to me like you are restating the problem. I want to know what the solution is and I am still listening. Thank you, Mr. Chairman. I have to yield now.

Mr. BOUCHER. Thank you very much, Mr. Barrow. The gentleman from Michigan, Mr. Rogers, is recognized for 8 minutes.

Mr. ROGERS. Thank you, Mr. Chairman. I appreciate you having this hearing. It is so very important. Unlike many, I am a complete optimist and fairly excited about where we are going on alternative fuels and when you look at where we have come in the last few years, it is really nothing short of remarkable, with hybrid buses in the cities which is reducing the emission and doubling the gas mileage in many cases. We started that in 2001, to increase the number of hybrid buses. And I think we if we figured it out, you replaced 13,000 of them with a hybrid bus in the cities, that is an equivalent of 600,000 hybrid cars on the road, so that is a big impact and they are making an impact.

And if you look at where the car companies are and I hear a lot of big government solutions to go and tell the car companies what to do, but I will use General Motors as an example. They just developed something called the Volt. Are you familiar with the GM Volt? That is pretty exciting technology in that car. Lithium ion batteries. We still have a little ways to go, but 540 miles on a tank of gas and the only thing that the fuel, either ethanol or gasoline, does is charge the batteries, so it has very low emissions, very high efficiency and we are close. I think they are looking somewhere between a 2010 and 2012 for commercialization of that technology. When you look at ethanol, the car companies stepped up in a big way. There are some two million cars out there ready to run on E-85. I own one and it is great. We happen to have a station in my hometown, so it is readily available, it is cheaper, cleaner. I have no problems with the car and I really enjoy driving the car. Great stuff.

So there has been a lot of progress. It seems to me, if we are going to have you all, which is the U.S. Government, get involved, I am not sure I want you all involved in such a huge way. Nobody told Ford, Chrysler and General Motors to make E-85 cars. You didn't mandate that, did you? Was there a mandate to do that?

Mr. KARSNER. There is an incentive to do that.

Mr. ROGERS. But there is no mandate? You didn't say you are going to build 2 million E-85 cars?

Mr. KARSNER. Well, indirectly, the CAFE mandate serves as an incentive for those flexible fuel vehicles to be produced.

Mr. ROGERS. So it is the 0.08 incentive in there that you get credit for, but you didn't say E-85. You just gave them the alternative fuel credit, did you not? It is a pretty good way to do it, an incentive. But we are talking about Cap and Trade, which is a very big complicated system. It means brokers make a lot of money, it costs more to build stuff, and I am not sure the environment is cleaner. My argument is we ought to encourage them to do what they are doing now and we can do it for a little bit of money, not a whole bunch of new programs. If we look at the one problem between the farmer part is working. The research part is almost there in places like Michigan State University, as I am sure you are aware, right on the cutting edge of cellulosic research. As a matter of fact, they have extracted sugar on the bench. All as they need to do is figure out how to produce it in mass quantities. They are right there. They think, for something like \$3 million, they can get to that next level. Three million bucks. We are talking about hundreds and hundreds of millions of dollars that are out here frequently. Refineries are being built because we built incentives into the energy bills. Build it and it will get this thing kick-started.

The one that worries me the most is the distribution because, as you said, I think, halfway, we inherited a pretty old system. We are hearing some disturbing things, that large oil companies are saying you can't put ethanol under the tarp of which we pay for. Are you hearing any these stories out there? In other words, and I won't give any company name, but the company will go out and we hope would assist you and build the gas station. So anything under that footprint, you can't put an ethanol plant because we don't sell ethanol. That is a hurdle that wouldn't be a legal impediment but

causes a problem in getting us more ethanol pumps. Are you familiar with the problem?

Mr. KARSNER. We have heard of that. We are familiar with that.

Mr. ROGERS. And what are we doing about that? Or what can we do about that?

Mr. KARSNER. I am not sure of what the full extent of what we can do about it. Secretary Bodman did pledge to investigate it and I am not sure what the extent of that investigation is.

Mr. ROGERS. That is an impediment that we have to get rid of, don't you agree?

Mr. KARSNER. It is a very complicated subject area, in the sense that it involves franchising contractual agreements, of which I am not an expert. But you know, fundamentally, if the question is what is necessary for a scale and rate of E-85 access, then it will involve greater access to the major franchises.

Mr. ROGERS. So this is an important issue and you think that maybe policymakers might want to a look at. I am not for big government intervention, but we just ought to understand the problem. Fair enough? Just so we know it is a problem. So part of this problem of distribution isn't necessarily the system of which we talked about. As far as the ability to do it, it is a whole set of other unknown, under-the-radar type of problems that are head-scratchers, hard to get through it.

Mr. KARSNER. I was going to say I think you characterized it very well, that there is a great reason to be very optimistic about the technologies that the Nation is invested on and their capacity to manifest, but there are a lot of very practical impediments.

Mr. ROGERS. We passed a bill in Congress last year and I think we are taking another run at it for providing CAFE fines, turn that money around and allow grants to gas stations, independent gas stations to put in ethanol pumps. The government needs to be very careful where we intrude in the market, but that probably serves as a value to kick-start kind of an ethanol economy. Don't you think it is important that we get enough pumps out there so that this takes on an economy of scale? Is it not and don't you do that through Clean Cities now to some small degree?

Mr. KARSNER. We do it but as you indicated, it is to a very small degree and with programs like SmartWay, we chip away at this giant boulder. The question is can we do it fast enough and in effect, scale enough to make a difference?

Mr. ROGERS. Would the \$20 million or so in CAFE fines every year from companies who don't meet our CAFE standards and pay those fines, would that be a better start than what you are doing now, if we dedicated all of that to increasing the number of pumps?

Mr. KARSNER. It would be a marginally additional chisel. We have \$8.6 million in Clean Cities now and we did 450 gas stations last year, and so we could continue to invest in it through this way, through substantial grants, but the key really would be to make it a profitable proposition for the incumbents to take on board.

Mr. ROGERS. Well, isn't this back to that horrible chicken and the egg? But if you can't buy it at a gas station, it doesn't become part of your routine to even to seek that opportunity. It is very difficult for someone to take the business risk, not knowing where the scale of ethanol is going to go. It is not like petroleum, where everybody

knew the car had to run on it. We are just not sure where this is going and it is probably in our national interest to encourage more pumps so that we can at least get some economy to scale, is it not?

Mr. KARSNER. Every bit helps, but that is pumps and flex-fuel vehicles and we would want substantial critical mass penetration of both and we would want it also so that we can look at all of the intermediate blends and what their possibilities may be upon EPA's review.

Mr. ROGERS. And I am going to run out of time here, so I want to switch gears very quickly. I think diversification is the key. Probably the Midwest is going to be able to head ethanol because it is close, but maybe the rest of the country is run on something else. I think that is OK. I don't think that is necessarily a problem. But lithium ion batteries, I think, are going to be a very important part of technology going into the future of alternative fuel vehicles. There is a patent problem with them now, as I understand it. Japan tends to hold and their companies to hold most of the patents, so our folks are trying to play catch up. Would it not be a great investment for us, rather than to do these big mandates, Cap and Trade, and we are going to tell Americans what kind of cars they can buy, to actually provide some assistance to companies like General Motors, who are trying to and desperately working furiously with their intellectual capital, end capital, to get these lithium ion. Isn't there some value in us doing this, from all of the problems—

Mr. KARSNER. We do that now and we do it in the very best way with our FreedomCAR and Fuel Partnership. It has largely been focused, particularly with General Motors and the other carmakers, on hydrogen over the last 5 years. We are increasingly more focused on how to move electrons, other than just the protons, through hydrogen fuel cells. So we see it integrating and growing in that collaboration, as you described.

Mr. ROGERS. But you didn't even come close. I guess what worries me and Mr. Upton mentioned it, the \$100 million that we thought was agreed on to get us to that point where we could have robust research on something that we could commercialize as soon as 2010, with the right resources, that helps America out of a problem. We got, to your words, \$11 million. Was that yours? So maybe it is even double that. So \$20 million, which is 80 percent short of where we need to be, but I would hope that the administration would hold true to what we all believe was a commitment to meet that demand and I think they are going to help us solve a problem versus EPA and the Department of Energy sitting around a table trying to figure out it. I would rather have research and development at General Motors and Ford actually getting their hands on some science to work it out. Thank you very much, Mr. Boucher.

Mr. BOUCHER. Thank you. The gentleman from Louisiana, Mr. Melancon, is recognized for 5 minutes.

Mr. MELANCON. Thank you, Mr. Chairman, I appreciate it. I guess, since I am from Louisiana, I am associated with the sugar industry and I want to talk about cellulosic ethanol or ethanol from sugar, but I have heard about hybrids, I have heard about coal, cellulosic, corn ethanol. I haven't heard anything about natural gas for vehicles and I know that the buses in the city run on natural

gas. I don't know whether it is LNG or whether it is just regular, the gas, natural gas itself. Do we have numbers on efficiencies, costs and other items, that it is not become a topic of conversation, at least not in here today and I haven't heard it before anywhere.

Mr. MEYERS. We did do calculations with regard to greenhouse gas on CNG. I think, between the Department of Energy and the EPA, we could probably find some numbers on vehicles and distribution. I am not sure exactly what data sets we have to draw from, but we could work and provide that to the committee.

Mr. MELANCON. Has there not been a lot of discussion about either compressed natural gas or LNG?

Mr. MEYERS. Well, no. CNG has been very helpful in a lot of the situations. We have had situations where, for example, it was California where, in order to offset power plant construction emissions, investment was made in CNG vehicles for garbage trucks and that type of shortfall, urban environment. So the emission reductions occurred in the urban center and certainly the experience with regard to emission profiles with the CNG vehicles has been very good, so we don't have a qualms with the technology or the emissions from CNG vehicles.

Mr. MELANCON. And the only thing I understand is your population difference and actually, I believe you could run one or the other, and I don't know which one, whether it is gasoline or the compressed natural gas carburetion and vice versa. So if that is the case, you could have a tank of regular gas and a tank of compressed natural gas back there, and wouldn't it be more efficient?

Mr. MEYERS. I think there are some factory vehicles. I don't know the extent of that technology, but we would be happy to—

Mr. MELANCON. Yes, I am just curious because I keep hearing everything about ethanol and coal. and I don't hear anything about it. I had an uncle and he has been dead for 12 years and probably for 35 years before that was running his tractors on compressed natural gas, which as a kid I thought that is great. Why aren't we doing it?

Mr. MEYERS. Well, I think we are doing it in certain contexts. I think it is a market-driven situation. We referred earlier to E-85 chicken and egg problem. With some respect, some of that problem has occurred with regard to the fueling infrastructure for CNG and historically, I think that has been an issue. So it has been used in fleet applications where you have central refueling. And again, I think, within the context of our programs, we have funded some through the Clean School Bus Program. So again, the market sort of decides those issues in our current structure.

Mr. MELANCON. We are talking about natural gas and we are talking ethanol and the problem of delivery systems, pipelines, tank trucks, whatever, and Mr. Markey made the comment about not getting his market. Mr. Barrow, the same thing. I think maybe I heard it on the Republican side. There is CNG in every part of this country I have ever been to. There are distributors of CNG in every part of this country I have been to. Is there not some incentive that we ought to be giving maybe instead of to Ford Motor and the oil companies and all, to the local distributors to start putting up at their convenience stores, because they are the jobbers, they are the ones that own those facilities, the CNG and encourage the

auto manufacturers to starting moving to it? Is there a downside that I am not understanding?

Mr. MEYERS. I don't see a downside, Congressman, and in fact, I think that is one of the goals of the AFS. The AFS gives CNG an incentive by making it qualified as an alternative fuel, which is subject to 35 billion mandated in the bill. So I think if you are looking for incentives, I think that is a very big incentive for CNG. The testimony you have from the second panel references certain costs of engines for the fuel, with respect to gasoline and gasoline prices and the combination of price, and the mandate, I think, could provide some significant incentives for the industry. Going back for a second to your question with regard to your vehicles using both, our role here would be with regard to the CNG conversions, that we have to ensure that those meet Clean Air Act requirements, so we see a number of conversion kits going to market and we are right now in the context of working with those issues with industry. So I think, as a whole, the EPA has tried to work these issues out and as a whole, I think we have seen emission benefits from CNG technology in the marketplace.

Mr. MELANCON. And I am running out of time. I didn't mean to pick on you, Mr. Meyers. I kind of threw it out for both of you all, but since you chose to take the ball and run with it.

I thank you, Mr. Chairman.

Mr. BOUCHER. Thank you very much, Mr. Melancon. The gentleman from Arizona, Mr. Shadegg, is recognized for 5 minutes.

Mr. SHADEGG. Thank you, Mr. Chairman. And I want to follow up on that series of questions. As I understand the current definition of renewable fuel, it would include natural gas produced from landfills or sewage treatment facilities but not any other type of natural gas. And I share the gentleman's interest in the issue and I guess I want to make sure that, am I correct about that understanding, that it would not include other natural gas? And if so, is there a reason for that?

Mr. MEYERS. Well, I think the reason was that in the Energy Policy Act of 2005, the mandate that was constructed dealt with renewable fuels, so the renewable fuel definition comes to a number of different types of fuels, but sort of a bottom-line analysis, if it is derived from plant or animal waste and other renewable feedstocks, it can pretty much qualify as renewable fuel. If not, if it is still a fossil fuel, Congress did not incorporate that.

Mr. SHADEGG. The point we made earlier, that we were faced with policy choices, now one option would be to define alternative fuel as any fuel that reduces the use of petroleum-based fuels, rather than using the definition of something that comes from something renewable, at least in the short term. As the gentleman pointed out, there is a lot of potential for natural gas, in moving vehicles, that has already been proven and natural gas is already widely available in homes and there are small compressors that you can get. That market seems to be some degree down the road. Is there a cogent argument why that shouldn't be considered as an—

Mr. MEYERS. No, the administration agrees with that argument and we specifically adopted natural gas as a fuel qualifying for AFS. Additionally, within the definition of alternative fuel in the

bill, there is a provision that would allow non-crude oil-based fuels to qualify also as alternative fuels in the future, subject to determination by the Department of Energy.

Mr. SHADEGG. Mr. Karsner, do you have any objection to that?

Mr. KARSNER. No, I agree completely.

Mr. SHADEGG. Mr. Karsner, I briefly met with Daniel Yergin and he had just been to Japan and he made the comment that the Japanese are as obsessed with battery technology as we are with ethanol. I have concerns about corn-based ethanol, some of the concerns about the corn market and the things it will do to our cost of food. I have fewer concerns about cellulosic ethanol. But I guess my question of you is are we doing enough, in this country, on battery technology, and are there things that this Congress should do to push us further down that road?

Mr. KARSNER. It is a great question, Congressman. I believe that electricity should become a primary pathway, a technological pathway and it is available under the Alternative Fuel Standard, just as natural gas would be. And so we would like to see as much upside as we can. Of course, this country took a different bend on our history with electrifying vehicles and electrifying trains and we are at somewhat of a competitive disadvantage. There are people on the second panel that can address this better than I. But as we restart our efforts towards electrification and first, we need to think in terms of what does it take to cultivate that industry here in the United States? We need much broader hybridization of the fleet in general, as a step-stone to plugging in a hybrid fleet in general and we need it for far more than just the luxury of feeling green with niche cars. We really need to hybridize efficiency across all of the vehicles that people want to buy and so we have doubled our investment in that. I think there are ideas out there about how we could go further and we are in emerging dialog with the car companies right now.

Mr. SHADEGG. I appreciate your suggestions perhaps as—I am running out of time and I want to ask another series of questions. I am aware of damage that has been done by fuel containing as little as 5 percent ethanol to the existing infrastructure and a lot of money being spent on that damage that has been done, ethanol levels of 5 to 10 percent doing damage to fuel tanks and fuel lines and lots of things. I am concerned that we are not studying the infrastructure issue enough. I believe it is Minnesota that is trying to go to a 20 percent standard and I asked a witness before this committee sometime back about that and the witness essentially mislead the committee and said no, they are not going to go to a 20 percent standard, when in fact they are. I believe there are serious issues with generators, chainsaws, lawn tools, motorcycles, the marine industry, ATVC.

At a 20 percent mandate, my question of you is two things: one, is there any warning that is being given, because the stories I have heard indicate there has been no warning given of the potential for damage. And second, has anybody ever given any thought to the creation of an unanticipated consequences fund? We all are aware that MTBE, when it was brought on line to clean our air, we thought was a good idea. Then we discovered it has an unanticipated consequence of damaging our water supply and so we had to

fix that and we had to come up with the money to fix it. I would suggest there are a lot of unanticipated consequences of higher proportions of content of ethanol and nobody's kind of looking down the road and saying, well, how are we going to fund dealing with those problems? And I would appreciate comments from both of you, if I could.

Mr. MEYERS. Sure, I can start. First, with regard to E-5 or E-10 problems, I am not personally aware—would be happy to receive—in terms of information. We would obviously be concerned if there are some issues there. Our experience, as I said earlier, generally has been that E-10 has been very successful in the marketplace and we have car standards now that were improved through the Mobile Source Air Toxics Rule, which even with the permeation standards, are applicable there. It will even reduce further some of the volatility emissions. But on a going-forward basis, I think we and EPA, in terms of looking at these fuel issues, take them very seriously and take the investigation and the analysis that is required very seriously and needs to occur.

And with reference to what I said earlier with regard to Minnesota, we are trying to work now with the parties involved and try to look at that issue closely to make sure we have the type of information that is necessary. We certainly recognize that the moment that an E-20 blend would be legal, then it would be legal to use in a lawn mower, legal to use in a snowmobile, legal to use in all types of equipment. So those are factors that we have to take into account, as well as obviously the performance of the emission control system and our fundamental authority is with regard to emissions and interference with the emission control systems. So those would be all factors in our review.

Mr. BOUCHER. Thank you very much, Mr. Meyer. And Mr. Shadegg, thank you. The gentleman from Utah, Mr. Matheson, is recognized.

Mr. MATHESON. Thank you, Mr. Chairman. In the development of the Alternative Fuel Standard list, can you share with me what the thinking was behind including natural gas as one of the alternative fuels?

Mr. MEYERS. Well, I think our initial cut, as I explained, was to try to adopt those fuels that Congress has defined as alternative fuels. With regard to natural gas, and I think we referenced earlier that, when the President announced this in the State of the Union address, we were talking about the energy security benefits as well as the environmental and greenhouse gas benefits that could be associated with use of the fuels. Most natural gas is much more domestic, I guess I would say, than our oil supply system, domestic and within North America.

Mr. MATHESON. Yes, you just hit the point I wanted to ask you about and that is I understand the environmental, but it is on the energy security benefits, based on the supply and demand dynamic we face today and looking forward. Did you consider the Department of Energy's projections about future increasing imports of LNG to meet our natural gas needs in this country, in terms of including it as one of the Alternative Fuel Standards for energy security purposes?

Mr. MEYERS. Not in my memory did we consider imported LNG specifically, but I don't think, in terms of the definitions that are applicable to the AFS right now and the fuels that are mentioned, that would be excluded.

Mr. MATHESON. I just want to get to the point that energy security was one of the rationales for adding it.

Mr. MEYERS. Sure.

Mr. MATHESON. And we are facing an future with increasing imports to meet our natural gas needs. I think that is something we ought to be talking about and figure out if that would make sense or not to have that included, the other fuels. One other question I wanted to ask about is fuel specification standards. Do you think these should be negotiated in the marketplace or should the government set standards?

Mr. MEYERS. We exert authority under the Clean Air Act to certify fuels, so we have current existing authority within 211(c) of the Clean Air Act. And so in terms of anything being sold for use in a motor vehicle, we need to make that determination consistently to law, so it is decided by government.

Mr. MATHESON. OK. Thanks, Mr. Chairman.

Mr. GONZALEZ [presiding]. The chair recognizes Mr. Green from Texas.

Mr. GREEN. Thank you, Mr. Chairman, for allowing me to participate in the hearing on fuels and as you know and the committee knows, I represent a lot of employees who manufacture gasoline at our refineries and so it is very important that we do not do anything to put those jobs in jeopardy, particularly since we need that refined product. Gasoline has its drawbacks, but it is also the cheapest and most efficient fuel that we produce today, so if you disrupt that supply and production of gasoline to a significant degree, the consequences will be felt by every American.

Mr. KARSNER, what effect on food prices and other economic consequences if we continue or further increase our Renewable Fuel Standards to require greater and greater levels of ethanol, such as 20 to 60 billion gallons per year figures in some pieces of legislation?

Mr. KARSNER. Well, I am not an agricultural economist, sir, but what I could say is that we don't expect grain-based ethanol that competes in the food and feed market to take us substantially beyond 10 percent. There are people on the next panel more qualified to talk to that. So we expect the bulk of things to come from non-food edible feedstocks, like agricultural residues and woody biomass and urban green waste, for example.

Mr. GREEN. Thank you. It is my understanding that the President's policy is assuming that cellulosic ethanol is going to supply that increase, as you mentioned just now, and it seems the President's proposal is pretty aggressive. It appears as a very complicated market rather than assurance of success. Instead of taking a leap and requiring more ethanol, when cellulosic ethanol is not yet ready, why would it be a more prudent course to wait until the current ethanol mandate is done in 2012, then decide whether to increase it further, if cellulosic ethanol is ready to market? Are we to that point now where we can pick up that 90 percent from cellulosic ethanol?

Mr. KARSNER. I would say we are certainly past the point where policy is required for future projections and installation of infrastructure that takes many years to erect and prove out. So you need a lead time, a substantial lead time for the market to react to invest the money that maybe 36 to 48 months later would produce the product.

Mr. GREEN. OK. So any bills we consider, we need to make sure we build in that lead time so investors and the market can adjust?

Mr. KARSNER. Well, in fact, I think that the President has tabled it now in 2007. We expect a working towards commercially competitive cellulosic ethanol by 2012. That is only one component, as are lithium ion batteries and the other technologies. So we think there is sufficient lead time right now built in if Congress were to act and give the President legislation he could sign.

Mr. GREEN. Mr. Meyers, a later witness from the National Resource Defense Council will testify that biodiesel produces much less greenhouse gas emissions than corn-based ethanol. Do you agree with that assessment? And so is there a valid reason promoting biodiesel standards within the Renewable Fuel Standard?

Mr. MEYERS. Yes. In terms of GHG emissions, we certainly agree that our current analysis shows biodiesel creates more benefits than corn-based ethanol, given the assumptions we did in our analysis, which, with respect to corn-based ethanol, was based on an average plan.

Mr. GREEN. Would that be a reason for promoting biodiesel as a Renewable Fuel Standard?

Mr. MEYERS. Yes, and Congress recognized that in the RFS and we recognize that in the AFS.

Mr. GREEN. OK. What is the EPA's latest view on the relative emissions from biodiesel, ethanol and gasoline for smog and air toxics? Will any of these new fuels be an improvement over gasoline? Is ethanol, as we know it today, clean fuel and will cellulosic ethanol be different to a greater degree?

Mr. MEYERS. Our impact analysis that accompany the RFS rule indicate what we thought would be our current assessment of the air emissions effects of ethanol blended fuels. What they showed essentially was that some emissions go up and some emissions go down. Emissions that go down include carbon monoxide and benzene as well as, obviously, our analysis of the GHG benefits. With regard to emissions that go up in areas that are not using ethanol blended fuels right now, there will be increases in—but when we did further analysis based on computer modeling of air quality impact, we showed that to be essentially less than one-half of part per billion on a standard of 84 PPB. So in other words, there are some issues we have to look at in the future. There could be some ozone effects with use of ethanol and I think our opinion is that there are ways to address those.

Mr. GREEN. It seems like our problem may be, and I know I am almost out of time, that if we want renewable fuels, it again limits our need to import hydrocarbons and at the same time, the committee's goal and the Congress' goal and I think we are getting there, is to deal with global warming. So it sounds like those are two goals that we can't match, using ethanol or even cellulosic technology.

Mr. KARSNER. I would say the overwhelming majority of all the alternative fuels available to meet our requirements would in fact be beneficial to greenhouse gas emissions, particularly if you consider the cellulosic ethanol will make up a substantial portion of that. We calculate, and Bob is in a better position to comment than I, but in excess of 80 percent decline in greenhouse gas emissions from the tailpipe, based on the use of cellulosic ethanol. I will oil the wheels.

Mr. GREEN. Thank you, Mr. Chairman.

Mr. GONZALEZ. Thank you, Mr. Green. Mr. Meyers, Mr. Karsner, I want to go ahead and extend the thanks of the subcommittee for your testimony this morning. Please understand that Members may be submitting questions in writing and we would really appreciate a prompt response to those written inquiries. Again, thank you for your service.

Mr. KARSNER. Thank you.

Mr. MEYERS. Thank you.

Mr. GONZALEZ. We will proceed now with the seating of the second panel. We extend a welcome to the second panel.

The witnesses on our second panel, let me make sure I have them in the proper order, Elizabeth A. Lowery, vice president for Environment, Energy and Safety, General Motors Public Policy Center; Mr. Warren I. Mitchell, chairman of the board, Clean Energy; Mr. Paul D. Reid, president and chief executive officer, Reid Petroleum Corporation; Mr. Robert Greco, group director, Downstream and Industry Operations; Mr. Charles T. Drevna, executive vice president, National Petrochemical and Refiners Association; Daniel A. Lashof, Climate Center science director, National Resources Defense Council; and Mr. Bob Dinneen, president, Renewable Fuels Association.

I think I have got everyone. I will caution everyone to please keep your testimony to the 5 minutes. Your written statements have been submitted and will become part of the record. But if you would keep to those 5 minutes so that—I know we will have Members coming in and out that will have questions. We will start off with the first witness and that is Ms. Lowery.

STATEMENT OF ELIZABETH A. LOWERY, VICE PRESIDENT, ENVIRONMENT, ENERGY AND SAFETY, GENERAL MOTORS PUBLIC POLICY CENTER, DETROIT, MI

Ms. LOWERY. Good afternoon. Thank you, Mr. Chairman and members of the subcommittee. My name is Elizabeth Lowery, vice president for Environment, Energy and Safety at General Motors and I am pleased to be able to speak to you today regarding GM's plans for expansion of vehicle offerings capable of using E-85 ethanol fuel and the need for ramping up the availability of this fuel and the infrastructure needed to make it available to American consumers.

Today's automotive industry provides more in the way of opportunities and challenges than we have seen in its entire history. On the challenge side, there is serious concerns about energy supply, energy availability, sustainable growth, the environment, and even national security issues that collectively have been called energy security. For the global auto industry, that means that we must,

as a business necessity, develop alternative sources of propulsion, based on alternative sources of energy in order to meet the world's growing demand for our products. The key is energy diversity, which can help us displace substantial quantities of oil that are consumed by U.S. vehicles today.

This is a huge assignment, but it is also an extraordinary opportunity. But developing alternative sources of energy and propulsion, we have the chance to mitigate many of the issues surrounding energy availability. We will be able to better cope with future increases in global energy demand. We will minimize the environmental impact of the automobile.

This means we must continue to improve the efficiency of the internal combustion engine, as we have for decades. But it also means we need to dramatically intensify our efforts to displace petroleum-based fuels by building more vehicles that run on alternatives and accelerating our commitment to the development of electrically-driven vehicles.

Today, I want to focus on our activities to accelerate the availability and use of alternative fuels. We believe that the biofuel with the greatest potential to displace petroleum-based fuels and provide carbon dioxide emission reductions in the U.S. is ethanol. As a result, we have made a major commitment to produce vehicles that run on E-85 ethanol. We believe there are many benefits of using E-85: it is renewable, it helps reduce greenhouse gas emissions, it helps reduce smog-forming emissions, and can help support the domestic agriculture industry in the United States.

GM has produced more than 2 million E-85-capable vehicles that are on the road today. For the 2007 model year, we have 16 flex-fuel models, from pickups and SUVs to full-size vans and minivans to our best selling Impala and Monte Carlo midsize family cars. But that is just the start. Along with DaimlerChrysler and Ford, we announced in June 2007 that America's three domestic auto companies will double our production of vehicles capable of running on renewable fuels by 2010. And later last year we were prepared to make fully half of our annual production biofuel-capable by 2012, provided there is ample availability and distribution as part of an overall national energy strategy. If all of the E-85-capable vehicles on the road today, along with those that GM, Ford and DaimlerChrysler are committing to produce over the next 10 years, were to run on E-85, we could displace 22 billion gallons of gasoline annually by 2017. Furthermore, if all the manufacturers made the same commitment, we could increase this displacement of gasoline to 37 billion gallons annually.

So the potential biofuels, like E-85, to significantly displace petroleum is within our grasp today. The vehicles are on the road or in the works, but they are not being fully utilized because of the constraints on E-85 supply and distribution. To help address these constraints, we are partnering with government, fuel providers and fuel retailers across the United States, to help grow the E-85 ethanol fueling station infrastructure. In 2006, there were 600 E-85 refueling stations. Today, the number of stations has more than doubled to over 1200. Since May 2005, GM has helped to add 240 E-85 fueling stations in 13 States, with more to come.

In addition to our partnerships, GM is heavily engaged in the promotion and education side of developing the ethanol marketplace. We launched a national advertising campaign in February 2006, beginning with the ads during the 2006 Super Bowl. The visibility and viewership presented by the Super Bowl offered a great opportunity for us to launch a major marketing and advertising campaign that focuses on key energy diversification issues. Web traffic to our *livegreengoyellow.com* Web site was in the millions as consumers investigated E-85, flex-fuel vehicles and station locations.

In addition, GM has partnered with the Governors' Ethanol Coalition to loan E-85 flex-fuel vehicles to 28 States and organizations so that they may use them to educate the public and promote the benefits of using ethanol. This partnership has been extended through 2007. We have also provided \$1,000 E-85 fuel coupon available with a new vehicle purchase in Chicago and Minneapolis areas. And across the country, flex-fuel vehicle owners that are equipped with OnStar can simply press the blue OnStar button and get directions to the nearest E-85 pump.

We are also equipping our E-85-capable cars and trucks with yellow fuel caps and exterior flex-fuel badging. This will help consumers know that their vehicle is flex-fuel capable. This yellow cap will also be a regular reminder that these consumers have a fuel choice each time they go to fill up their tank.

Importantly, as we pursue expansion of biofuel to the market, there are steps the government can take to help. First, we need a strong and sustained push from Congress and the administration to support biofuel production, including next-generation cellulosic ethanol. Second, the biofuels infrastructure should be significantly expanded. The market response to renewable fuels is encouraging, but it needs to reach a self-sustaining level that is not lessened when gasoline prices fall.

Mr. BUTTERFIELD [presiding]. We are going to have to ask you to conclude, please.

Ms. LOWERY. Sure. Steps to increase the availability of biofuels should help increase its use. And third, government purchasing should set the example. Government fleets should be using E-85 ethanol.

In summary, we believe tomorrow's automobiles must be flexible enough to accommodate many different energy sources, and part of that flexibility will be enabled by the continued focus on E-85. Thank you and I look forward to your questions.

[The prepared statement of Ms. Lowery follows:]

TESTIMONY OF ELIZABETH LOWERY

Good morning. My name is Elizabeth Lowery and I am Vice President for Environment, Energy, and Safety Policy at General Motors. I am pleased to be able to speak to you today regarding GM's plans for expansion of vehicle offerings capable of using E-85 ethanol fuel and the need for ramping up the availability of this fuel and the infrastructure needed to make it available to American consumers.

Today's automotive industry provides more in the way of opportunities—and challenges—than we have seen in its entire history. On the challenge side, there are serious concerns about energy supply, energy availability, sustainable growth, the environment, and even national security issues that, collectively, have come to be called "energy security." And the fact of the matter is that it is highly unlikely that oil alone is going to supply all of the world's rapidly growing automotive energy re-

quirements. For the global auto industry, this means that we must—as a business necessity—develop alternative sources of propulsion, based on alternative sources of energy in order to meet the world's growing demand for our products. The key is energy diversity, which can help us displace substantial quantities of oil that are consumed by U.S. vehicles today.

This is a huge assignment. But it's also an extraordinary opportunity.

By developing alternative sources of energy and propulsion, we have the chance to mitigate many of the issues surrounding energy availability. We will be able to better cope with future increases in global energy demand. We will minimize the automobile's impact on the environment.

This means that we must continue to improve the efficiency of the internal combustion engine, as we have for decades. But, it also means we need to dramatically intensify our efforts to displace petroleum-based fuels by building more vehicles that run on alternatives, such as E-85 ethanol, and, very importantly, by significantly expanding and accelerating our commitment to the development of electrically driven vehicles.

Today I want to focus on our activities to accelerate the availability and use of alternative fuels. We believe that the biofuel with the greatest potential to displace petroleum-based fuels and provide carbon dioxide emissions reductions in the U.S. is ethanol. As a result, we have made a major commitment to produce vehicles that can run on E-85 ethanol.

We believe there are many benefits of using E-85:

- Ethanol is a renewable fuel
- Using E-85 helps reduce greenhouse gas emissions
- Using E-85 helps to reduce smog forming emissions
- Using E-85 can help to support the domestic agriculture industry in the U.S. and support new job growth

GM has produced more than 2 million E-85 capable vehicles that are on the road today. For the 2007 model year, we have 16 flex fuel models, from pickups and SUVs to full-size vans and minivans, to our best selling Impala and Monte Carlo midsize family cars. But that is just a start. Along with DaimlerChrysler and Ford, we announced in June of last year that America's three domestic auto companies will double our production of vehicles capable of running on renewable fuels by 2010. That's more than two million E-85 and biodiesel-capable vehicles a year by the end of the decade—the single largest commitment to renewable fuels in our nation's history. And then, later last year—in a meeting with President Bush—GM, Ford and Daimler Chrysler announced that America's domestic auto companies were prepared to make fully half of our annual vehicle production biofuel capable by 2012, provided there is ample availability and distribution, as part of an overall national energy strategy.

Let me put the significance of these announcements in perspective. If all of the E-85 capable vehicles on the road today—along with those that GM, Ford, and DaimlerChrysler have already committed to produce over the next 10 years—were to run on E-85, we could displace 22 billion gallons of gasoline annually by 2017. Furthermore, if all manufacturers made the same commitment, we could increase this displacement of gasoline to 37 billion gallons annually.

So, the potential of biofuels like E-85 to significantly displace petroleum is within our grasp today. The vehicles are on the road or in the works, but they are not being fully utilized because of constraints on E-85 supply and distribution.

To help address these constraints, we're partnering with government, fuel providers, and fuel retailers across the U.S. to help grow the E-85 ethanol fueling station infrastructure. In 2006, there were 600 E-85 refueling stations, today the number of stations has more than doubled to over 1200. Since May of 2005, GM has helped add 240 E-85 fueling stations in 13 states—with more to come. Some highlights include:

- In 2005, GM co-marketed fuel coupons and owner awareness in Sioux Falls, South Dakota.
- The Department of Energy awarded a grant to a team from GM, CALSTART, Pacific Ethanol, CleanFUEL USA, Community Environmental Council, and others to add 15 E-85 pumps in California.
- GM has partnered with Kroger—in Texas and we've helped E-85 outlets grow from 1 to 27 in the past year.
- Through our partnership with Kroger pumps are in operation in Ohio with co-marketing events including a dealer breakfast.
- GM is supporting the state of Colorado with the recently announced opening of 40 additional stations including "85 cent fuel days" promotions.

- We have partnered with Meijer, CleanFuelUSA, the State of Michigan and the State of Indiana to introduce approximately 40 new retail outlets.
- We have similar partnerships in Illinois that launched 20 stations with VeraSun, Gas City and Shell; and in Minnesota with VeraSun and Erickson Oil accounting for 10 additional stations.

We need to do more of this—and we will.

In addition to our partnerships to enhance availability and distribution, GM is heavily engaged in the promotion and education sides of developing the ethanol marketplace. We launched a national advertising campaign in February of 2006—beginning with an ad during the 2006 Super Bowl hosted in Detroit. The visibility and viewership presented by the Super Bowl offered a great opportunity for us to launch a major marketing and advertising campaign that focuses on key energy diversification issues. After the Super Bowl, the campaign continued through the 2006 Winter Olympics. Web traffic to our Livegreengoyellow.com website was in the millions as consumers investigated E-85, GM flex fuel vehicles, and station locations.

In addition, GM has also partnered with the Governors' Ethanol Coalition to loan E-85 flex fuel vehicles to 28 states and organizations so that they may use them to educate the public and promote the benefits of using ethanol. This partnership has been extended through 2007. We have also provided a \$1000 E-85 fuel coupon available with a new vehicle purchase in the Chicago and Minneapolis areas. And across the country, flex fuel vehicle owners of vehicles equipped with OnStar need to simply press the blue OnStar button and get directions to the nearest E-85 pump.

We are also equipping our E-85 capable cars and trucks with yellow fuel caps and exterior flex fuel badging. This will help consumers know that their vehicle is flex fuel capable. The yellow cap will also be a regular reminder that these consumers have a fuel choice each time they fill up their tank.

So, overall, technology, biofuels and energy diversity are the best answers to oil security concerns. And, as we pursue these technologies—and more energy diversity—there are steps the government can take to help.

- First, we need a strong and sustained push from Congress and the Administration to support biofuel production, including next-generation cellulosic ethanol.
- Second, the biofuels infrastructure should be significantly expanded. The market response to renewable fuels is encouraging, but it needs to reach a self sustaining level that is not lessened when gasoline prices fall. Steps to increase the availability of biofuels should help increase its use. Government should continue incentives for: the manufacture of biofuel-capable flex fuel vehicles and increased support for broad-based infrastructure conversion.
- Third, government purchasing should set the example. Government fleets can help lead the way to bringing new automotive technology to market and bringing down the cost of new technologies. The government should continue to purchase flex fuel vehicles, require maximum utilization of E-85 in the government flex fuel fleets and use Federal fueling to stimulate publicly accessible pumps.

Before concluding, let me note the importance of the Underwriter's Laboratory process of certifying the safety of the dispensing equipment for E-85. Certification of the dispensing systems is critical for widespread development of E-85 infrastructure. Since the use of E-85 here and in other parts of the world is well established at this point, we are optimistic that this process can be completed quickly. Our technical experts are assisting UL and we know that UL is working hard on this project. We urge the Committee to stay abreast of this process as well—to make sure that no artificial hurdles arise to needlessly slow the UL approval process.

In summary, we believe tomorrow's automobiles must be flexible enough to accommodate many different energy sources. A key part of that flexibility will be enabled by the continued focus on getting E-85 fuel and vehicles capable of using that fuel into the market quickly. We look forward to working with the Congress and the Administration to make this even more of a reality.

Mr. BUTTERFIELD. Thank you very much. Mr. Mitchell, you are recognized for 5 minutes.

**STATEMENT OF WARREN I. MITCHELL, CHAIRMAN OF THE
BOARD, CLEAN ENERGY, SEAL BEACH, CA**

Mr. MITCHELL. Thank you, Mr. Chairman and honorable members of the Energy and Air Quality Subcommittee. I am Warren

Mitchell, chairman of Clean Energy, which provides natural gas infrastructure and fuel to fleets and consumers. I am also retired chairman and president of Southern California Gas Company. I look forward to amplifying on some of the questions that were raised during the first panel.

I believe that the 35 billion gallon goal for petroleum reduction for 2017 is certainly a stretching goal but it is one that I believe is achievable if we use renewables as well as alternative fuels. Because of declining oil production and our view that production and demand have hit peaks, at least production at 85 million barrels a day, and we are consuming worldwide about 85 million barrels a day. There is a real need to meet this 35 billion goal by 2017. Primarily because of the growth in China and India for oil demand, we believe oil prices will continue to increase, which will place greater pressure on gasoline and diesel prices.

Ethanol and biodiesel, we agree, are good solutions to contributing to the 35 billion gallon goal, but we think that they are capable of meeting about 18 billion gallons a year reduction by 2017. Therefore we believe alternative fuels need to be included as part of the solution and we believe that natural gas is especially an important fuel for that consideration. It is clean, it is domestic, it is economic, there is a major infrastructure in place and it can make a strong contribution and I think, with some of the things that I cover in a few minutes, you will understand that we are not confronted with the chicken and the egg issue. When I said clean, light-duty vehicles meet near-zero emission standards and heavy-duty vehicles will meet the 2010 standards this year. They produce 27 percent fewer of greenhouse gases when compared to gasoline, and 21 percent fewer greenhouse gases when compared to diesel. So they make a strong contribution to our global warming concerns.

When I mentioned domestic, 98 percent of the natural gas demand in the United States is met by gas produced in North America. Seventy-seven years of resources remain in the United States, based on current usage and I want to put the utilization of natural gas for transportation in perspective. If 11 million vehicles were powered by natural gas, there would only be a 4 percent increase in our national throughput, but we would displace 8 billion gallons of imported petroleum.

When I talk about infrastructure, you have a national pipeline system that reaches nearly every community in the United States. Now Clean Energy, my company, builds refueling infrastructure for fleets on a no-capital cost basis to the fleet operator. Because we have such a competitive fuel advantage, we can absorb the capital cost in the cost that we charge to the fleet owner. We are confident about the price of natural gas as we move forward and we offer fleet operators 3- to 5-year fixed price contracts for their fuel. And this is a major concern when you have the types of spikes we have when you look at gasoline and diesel. These infrastructures that we build for centralized refueling for fleets are also made available for public access so we can have smaller consumers utilize those as a place to refuel. Now the real breakthrough that hasn't been mentioned in the past very much is that there is a home refueling appliance that can be installed in any garage that has a gas piping system and 110-volt electrical plug to fill it in and it can slow fill

a vehicle overnight with about 8 or 10 gallons. So the consumer that wants a natural gas vehicle doesn't even have to go to a re-fueling station.

When I talk about economics, we are talking about \$1.95 cents a gallon, currently, for fleet operators, which covers all costs, including fuel. And we are talking about \$2.17 equivalent costs for diesel. If you look at the home refueling unit, it provides natural gas to the consumer for \$1.36 a gasoline gallon equivalent.

Current gas prices are \$3.00 for gasoline and \$2.95 for diesel. So what I want to say is we have a proven technology here with ample supply that can meet the air quality standards. What we need, we need the Renewable Resource Initiative to be including an alternative fuel component, we need to extend the current energy and highway bill benefits through 2017, and then natural gas can be a real player. We also would support incentives for automakers in the United States to build more natural gas vehicles, although there are about 180 vehicles in light, medium and heavy-duty applications available today.

Thank you and I look forward to your questions.

[The prepared statement of Mr. Mitchell follows:]

TESTIMONY OF WARREN I. MITCHELL

Good morning Chairman Boucher and Honorable Members of the Subcommittee on Energy and Air Quality. My name is Warren Mitchell and I currently serve as the Chairman of Clean Energy - North America's leading clean transportation fuel provider. Before I joined Clean Energy's board, I served as Chairman and President of the Southern California Gas Company. I want to thank you for having me before you today to share my thoughts on this very timely national issue.

Clearly, the country is facing an impending transportation fuel crisis, and it is appropriately challenging itself to fill a 35 billion gallon per year renewable fuel goal by 2017. The country is also coming to the realization that there is no one "silver bullet" that can solve our country's over dependence upon oil. More to the point, many alternatives that the nation has focused on to date can carry a premium, face significant air quality challenges with uncertain climate change benefits, require significant subsidies or have yet to even be produced at any substantive scale. This is why it is imperative that Congress widen its focus on renewable fuels to include other alternatives that can help promote greater energy independence, advance clean air and climate change goals, and bridge this country toward both a renewable and zero emission future.

Although it is often overlooked, downplayed or misunderstood, there is a fuel that is largely domestic, low in carbon, historically exceeds vehicle emissions standards, and can be produced from a renewable feedstock. The fuel that I speak of also is price-competitive with petroleum, enjoys an existing national infrastructure that can fuel vehicles at stations or in the convenience of your own home, provides a bridge to a hydrogen future, and currently fuels cars, school and transit buses, refuse and port trucks by the thousands; displacing hundreds of millions of gallons of petroleum today. What is this miracle fuel you ask? It's natural gas, and yes, it's the same fuel that powers the range that you cook with, your water heater, and possibly generates electricity for your local utility.

Today, Clean Energy fuels over fourteen thousand vehicles daily with clean, affordable, and domestically produced natural gas. Our company, with an annual growth rate of 28 percent over the past three years, operates over 170 fueling stations nationwide, and is on track to sell approximately 82 million gallons of natural gas in 2007. Unlike some fuels, natural gas can provide our nation with an immediate solution to foreign oil dependency, mounting urban air pollution challenges, and global climate change, while providing a direct bridge to a hydrogen future. Natural gas is in many ways an ideal transportation fuel solution and will remain so well into the future.

GLOBAL OIL SUPPLY

Clean Energy is no longer alone in the camp that believes that high oil prices are here to stay. The world recognizes that it is looking straight into a looming supply-demand problem. Oil is a finite and dwindling resource and the world's demand for it keeps on growing. There is no question that the world will continue to face stubbornly climbing oil prices for the long term.

Let's take a look at the facts. In the Arab embargo back in the 1970s, we were importing approximately 25 percent of our oil. In the first Gulf War, we were importing 42 percent of our oil. Today we are importing 64 percent and we can only expect to be worse off if we fail to diversify our transportation fuels in the near term. We've been pumping oil out of the ground since 1859. The last time a world class oil field was found was in the Caspian Sea in the late 1990s. The easy oil has been found. There are no surprises out there. We've either peaked as far as oil production goes, or it's right around the corner.

Demand is growing globally. China used 3.4 million barrels of oil per day a decade ago. Today they are currently over 6.7 million barrels per day. There are forecasts showing them using 11 million barrels per day a decade from now. Wait until they really start buying automobiles. We are using more than 30 billion barrels of oil a year worldwide. The last time we found as much oil in a year as we consumed was 1985. Production worldwide remains steady at 84-85 million barrels a day. Current demand is about 85 million barrels a day and demand projections for 2008 are easily north of that given China and India's increasing demand.

The treadmill is getting faster and faster. The decline curve for oil production is steady. Saudis say they can produce 10.8 million barrels per day, but they're only producing 8.6 million barrels per day. We all heard talk three years ago of Iraq production reaching 3 million barrels per day. They are producing roughly 2 million barrels. To make matters worse, we've also got some serious geopolitical problems: Iran, Venezuela, Nigeria, and Russia. They are all wild cards.

ALTERNATIVES TO OIL

We, as a nation, must look at all solutions and we need to get serious about fuel diversity now. We all have known that an oil shortage was coming. Even assuming optimistic new production sources coming on line, balanced with estimated production decline curves, the demand-production gap could be as high as 30 million barrels per day in 2020. Clean Energy agrees with many energy experts that there is no one "silver bullet" alternative that can solve our petroleum dependence. All renewable and alternative fuels must be encouraged because farm fuels, i.e., ethanol and biodiesel, cannot by themselves achieve the petroleum displacement goals that Congress and the President are considering today. Assuming that ethanol and biodiesel achieve their greatest forecasted production targets, they would fall 18 billion gallons short of a 35 billion gallon a year displacement goal for 2017. Even with a five year extension to 2022, it is unlikely that these fuels alone will reach Congressional targets. Therefore, we urge the Committee to expand the "Renewable" Fuel Standard to an "Alternative" Fuel Standard, and allow natural gas to play a significant role in displacing petroleum in the transportation market.

NATURAL GAS IS DOMESTIC, ABUNDANT AND RENEWABLE

Natural gas is a domestic source of transportation fuel with an estimated 77 years of additional supply or 30 years extra supply over oil. Over 98 percent of our current use of natural gas is produced in North America, which helps protect us from unstable geopolitical situations and helps our energy independence by not importing as much foreign oil. Over time, we believe natural gas will be moved out of the power generation business by coal, nuclear, and other renewables, further increasing the availability of domestic natural gas supplies for our country's transportation needs. Regardless, natural gas use in the transportation sector would have a negligible impact on supply. To put this into perspective, if we powered 11,000,000 light-duty vehicles or 5 percent of the U.S. light-duty fleet with natural gas today, it would only account for 4 percent of the country's current natural gas fuel usage. Further, with the advancements in pyrolysis to convert coal and biomass to methane, an already abundant national supply of natural gas could be augmented by a source capable of providing extraordinary climate change benefits.

NATURAL GAS IS CLEAN

Natural gas burns clean and efficiently. Natural gas vehicles meet near-zero emission levels for passenger car applications and already meet or exceed 2007 heavy-

duty emission standards with some truck engines targeted to certify to the 2010 standard as early as this year. Not only is natural gas inherently cleaner than gasoline or diesel, it also provides a readily available low carbon alternative that can be implemented today. In fact, a recent California Energy Commission “well to wheels” analysis found that natural gas provides roughly a 27 percent reduction in greenhouse gases for light-duty vehicles and up to a 21 percent reduction for medium- to heavy-duty vehicles when compared to their petroleum counterparts.

NATURAL GAS IS ECONOMIC

Natural gas is economic. The price for natural gas as a transportation fuel is very competitive with today’s gasoline or diesel fuels. In fact, natural gas was very competitive with oil at \$30 a barrel, let alone at the market’s current price of \$64 a barrel. Clean Energy views natural gas as a commodity tracking at a discount to oil, especially when compared to diesel. For example, if you assume a natural gas price at \$7.61 per thousand cubic feet and \$1.01 to cover transport, compression, taxes, and capital recovery costs, you can achieve a very competitive \$1.96 gasoline gallon equivalent or a \$2.17 diesel gallon equivalent. As of Thursday, national gasoline averages ranged from \$2.99 to \$3.29 per gallon and diesel averaged at \$2.92 per gallon.

Historically, the overall market has suffered over a dozen global oil supply disruptions over the past half century lasting 1 to 44 months in duration with supply shortfalls of one to 14 percent of world demand, adding to the volatility of oil prices. Despite the reality of volatile oil prices and unlike any energy provider we know, our company is able to guarantee a fixed price per gallon of natural gas to our fleet customers below today’s gasoline and diesel prices for up to five years on a energy equivalent gallon basis.

In addition to the comparatively low cost of natural gas as a transportation fuel, Congress took an important step in passing the energy and highway bills two years ago. As the cost of uncertain diesel technology increases in an effort to meet new federal clean air emission standards, the 2005 energy bill provides up to a \$32,000 tax credit for medium and heavy-duty trucks that can serve our refuse, transit, and goods movement industry sectors. This tax credit is helping to narrow the incremental cost differential between diesel and natural gas vehicles. When fuel price and operational maintenance savings are factored in, natural gas vehicles become even more cost-effective than their diesel counterparts. Because some of the incentives put in place are going to take awhile to have a real impact, we need Congress to continue to provide long-range policies that promote alternative fuels in the marketplace through 2017.

NATURAL GAS INFRASTRUCTURE

Perhaps the greatest challenge for any alternative to oil is the ability to distribute product to the end user. Natural gas, unlike other alternative fuels, enjoys the advantage of possessing a vast nationwide network of existing gas pipelines capable of delivering natural gas product to nearly every American community. Clean Energy has developed a strategic business model enabling the cost-effective development of a natural gas station network. This revolutionary approach creates a secondary station infrastructure to gasoline and diesel by leveraging private and public-private partnerships to create an extensive network. These turn-key partnerships enable high-volume fleet users to benefit from privately financed refueling stations while providing smaller volume users with public access at these stations. Further, consumers can immediately take advantage of natural gas as a transportation fuel with the simple installation of a low cost home refueling system that is currently on the market. Moreover, natural gas stations can provide an early introduction of hydrogen by using a 10 to 30 percent blend, reducing the immediate need for high-cost fuel cells to achieve near-zero air emissions.

NATURAL GAS VEHICLE AVAILABILITY

Natural gas vehicles are currently available, proven, and tested in transit, refuse, shuttle, taxi, police, airport and municipal fleet applications throughout the United States. These applications were primarily driven by the clean air benefits inherently derived from the use of natural gas. However, for years, American and foreign auto manufacturers have produced an ever increasing selection of natural gas vehicle products in Europe, Asia and Central and South America—both dedicated and bi-fuel—for natural gas vehicles to address concerns over high oil prices. These OEM-produced vehicles are fully integrated providing consumers the mileage range and conveniences of gasoline vehicles. Congress should join other world leaders by

strongly encouraging auto manufacturers through incentives or mandates to produce a greater range of natural gas vehicles for the American consumer.

NATURAL GAS MARKETS

Like all alternative fuels, natural gas as a transportation fuel satisfies several key niche markets that can provide significant petroleum displacement. As of December 31, 2006, Clean Energy had over 200 fleet customers operating over 14,000 vehicles, including 3,000 transit buses, 1,200 taxis, 800 shuttles and 790 refuse trucks. With the expansion of America's goods movement system, the San Pedro Bay Ports have already signaled an interest in purchasing over 5,300 liquefied natural gas class 8 trucks within the next five years, displacing approximately 80 million gallons annually of petroleum alone. If Congress were to require transit, refuse and taxi fleets to adopt alternative fuels into their portfolios, the benefits could be as great as 4.3 billion gallons displaced annually.

NATURAL GAS BRIDGE TO HYDROGEN

Natural gas is also viewed as a bridge fuel to hydrogen as it continues to be the most cost-effective way to produce hydrogen and provides invaluable experience and knowledge to users on how to handle gaseous fuels. In addition, natural gas infrastructure can be leveraged to provide hydrogen as well as blended hydrogen/natural gas dispersing. In fact, the blending of hydrogen and natural gas, similar to our station in Vancouver, Canada, provides even lower near zero emission performance at the tailpipe. If the US possessed fully integrated OEM produced natural gas vehicles, these vehicles can operate on natural gas, hydrogen, and blended hydrogen/natural gas fuels.

POLICY RECOMMENDATIONS

Achieving the production goals of 35 billion gallons annually by 2017 and 50 billion gallons per year by 2030 requires the addition of fuels beyond the renewable portfolio and the inclusion of alternative fuels to this portfolio is critical for the country's security and economic and environmental health. Clean Energy urges Congress to transform the Renewable Fuel Standard enacted under the Energy Policy Act of 2005 into an Alternative Fuel Standard to help avoid a potential 18 billion gallon production shortfall in 2017. Furthermore, and whenever possible, Congress should assure the public that all fuels within this portfolio do no harm to air quality or cause air quality backsliding prior to their implementation. Congress should also recognize and provide more research, development and deployment dollars toward biogas projects as pyrolysis and other advancements can certainly further our country's renewable and climate change goals. Congress should extend the tax credits for alternative fuels and vehicles established under the Energy Policy Act through 2017 in an effort to provide added certainty to fleet owners who lead in early alternative fuel adoption. Further, we believe federal action requiring key public and private fleets to adopt and implement alternative fuel strategies will help foster the alternative fuel penetration required to achieve the nation's alternative fuel goals for 2017 and beyond.

Natural gas vehicles offer a proven solution in light-, medium-, and heavy-duty vehicles that are ready for wide-scale implementation today. Our resources of natural gas can play a critical role in diversifying our nation's transportation fuel needs. Natural gas is a clean, inexpensive, and a potential renewable fuel that is domestically abundant and helps reduce greenhouse gases. In leveraging natural gas as a transportation fuel we not only take advantage of existing pipeline infrastructure but also foster the production of cleaner vehicles for our children's future. The societal experience of operating a natural gas vehicle is likely the only realistic approach to achieving a hydrogen economy. Clearly, Congress must enact more national policies like the 2005 Energy and Highway bills to help natural gas and other alternative fuels penetrate the marketplace and be made available to the public. One thing to do right now would be to extend the tax credits and other benefits to 2017 and require certain niche markets (i.e., transit, refuse, port, and taxi cabs) to use alternative fuels. Without the firm support of the Congress behind all petroleum alternatives, our nation's ability to free itself from its current oil dependence will most certainly put our nation's economy, security, and overall public health at risk. Clean Energy urges the expansion of the current Renewable Fuels Standard toward a broader Alternative Fuels Standard that includes clean, domestic and affordable natural gas as a transportation fuel.

Mr. BUTTERFIELD. Thank you very much. Mr. Reid, 5 minutes.

STATEMENT OF PAUL D. REID, PRESIDENT AND CHIEF EXECUTIVE OFFICER, REID PETROLEUM CORPORATION, LOCKPORT, NY

Mr. REID. Thank you, Mr. Butterfield and members of the subcommittee, for holding this hearing today and inviting me to testify. I serve as the chief executive officer of the Reid Group based in Lockport, New York. The Reid Group distributes Mobil, Sunoco, Citgo, Coastal and unbranded motor fuels throughout upstate New York and northwest Pennsylvania.

I appear today on behalf of the Society of Independent Gasoline Marketers of America, SIGMA, where I serve as president, and the National Association of Convenience Stores, NACS, of which I am a member. Together, SIGMA and NACS members sell approximately 80 percent of all motor fuels in the United States.

At the outset, I would like to correct the record concerning some statements made regarding the composition of the retail motor fuel market during the subcommittee's hearing on April 18, 2007. A witness at that hearing mentioned that only 18 to 20 percent of the retail motor fuel locations are independently owned and operated. In fact, the composition of the retail marketplace is much more diverse than this. Of the more than 165,000 motor fuel retail locations in the Nation, 95 percent are operated by independent businesses. Therefore, as the Nation transitions toward the sale of more renewable fuels, independently-owned businesses will be leading the charge.

Congress should be pleased that the market is proceeding to offer renewable fuels ahead of the federally-mandated schedule. There is no reason to believe that this will not continue in the absence of increased mandate. SIGMA and NACS do not oppose the transition to a renewable fuel economy, however, we urge Congress, in its decisions, to be fully cognizant of the economic and consumer consequences associated with continuing mandates on the motor fuel business.

To this end we recommend Congress: (1) make any increased mandate contingent upon a finding that there is enough supply and sufficient infrastructure to deliver this product; (2) that any Federal promotion of an alternative fuel focused on compatibility with existing infrastructure; and (3) that Federal policies represent the best interests of your constituents' economic welfare.

To illustrate the complexities associated with non-compatible alternative fuels, let me talk for a moment about the challenges our industry is having with E-85. Although alternative fuel proposals under consideration may present even more complex compatibility issues, but we think the E-85 experience serves as a good benchmark. Because E-85 is more corrosive than regular gasoline or fuel for the lower concentrations of ethanol such as E-10, it requires vehicles and equipment that are compatible with the fuel. The least expensive approach to sell E-85 is the retrofit of a pump system that are already has the compatible tank. Many older tanks are not compatible. This requires replacement of several components. For all of these conversions, including tank cleaning, I estimate the cost

to be between \$8,000 and \$9,000. And again, this is still using the same pump or dispenser.

To convert with a new dispenser specially manufactured to sell E-85, I would be facing an expense of something in the range of \$20,000 to \$25,000. Of course, that is a bargain compared to the installation of an entirely new system for E-85, with a new tank, for which I was recently quoted a price of \$75,000. Other members have quoted much higher prices. As Mr. Hastert pointed out earlier, currently there are no systems that have UL approval, although we expect that in fairly near future.

Also please keep in mind that the annual pretax operating profit for a convenience store in 2006 was a mere \$33,000. The infrastructure cost to install alternative fuel systems, therefore, are so substantial that, ultimately, consumers will pay the price. And price is another very important factor for this committee to consider, as few other issues attract as much attention from consumers, the media and Congress as does the price of gasoline.

NACS recently fielded a survey to assess consumer sensitivity to gasoline prices. This survey found that more than one-quarter of consumers will turn left across a busy intersection to save one penny per gallon, and half of consumers will do so for three pennies per gallon. What the NACS survey further revealed, however, is that while consumers want to promote a green economy, when they go to fuel their vehicles, the only green that truly matters is either the green in their wallets on their charge cards. Because more and more consumers are using their credit cards to buy gas, our marketing costs are rising dramatically; but we can leave credit card discussions for another day.

In closing, as Congress considers policies to accelerate the market's transition, SIGMA and NACS urge you to keep in mind the nature of the retail marketplace and to remember the economic interests of your constituents. Government mandates are often antithetical to a free motor fuels marketplace and will typically wind up harming consumers in the short run and beyond. Thank you for the invitation to testify. I will be happy to answer any questions my testimony may have raised.

[The prepared statement of Mr. Reid follows:]

**TESTIMONY OF PAUL D. REID
ON BEHALF OF THE
SOCIETY OF INDEPENDENT GASOLINE MARKETERS OF AMERICA
AND THE
NATIONAL ASSOCIATION OF CONVENIENCE STORES
BEFORE THE SUBCOMMITTEE ON ENERGY AND AIR QUALITY
COMMITTEE ON ENERGY AND COMMERCE
U.S. HOUSE OF REPRESENTATIVES**

MAY 8, 2007

Thank you, Chairman Boucher and Members of the Committee, for holding this hearing today and inviting me to testify. My name is Paul Reid. I am the Chief Executive Officer of the Reid Group, which is based in Lockport, New York. The Reid Group distributes Mobil, Sunoco, Citgo, Coastal, and unbranded motor fuels throughout Upstate New York and Northwest Pennsylvania.

I appear today on behalf of the Society of Independent Gasoline Marketers of America ("SIGMA"), where I serve as President, and the National Association of Convenience Stores ("NACS"), of which I am a member. SIGMA is an association of more than 250 independent motor fuel marketers operating in all 50 states. SIGMA members sell more than 30 percent of all motor fuels sold in the United States and supply more than 35,000 retail outlets across the nation. NACS is a non-profit trade association representing the convenience and petroleum retailing industry. This industry operates more than 145,000 retail locations and, in 2006, sold \$405.8 billion worth of motor fuels. Together, SIGMA and NACS members sell approximately 80 percent of all motor fuels in the United States.

Thank you for providing me with the opportunity to share our industry's perspective on the current debate regarding the future of renewable and alternative fuels. I would like to begin

by assuring this Committee that petroleum retailers do not have a preference on which liquid motor fuels we sell, provided there is sufficient supply and consumer demand for those products. It is upon these issues of supply and demand that I will focus my comments today.

Before I begin, however, I would like to correct the record concerning some statements made regarding the composition of the retail motor fuel market during this Subcommittee's hearing on April 18, 2007. I believe it is critical for Congress to understand how the retail market place operates when considering policies that might affect it. It was mentioned by a witness at that hearing that only 18-20 percent of retail motor fuel locations are independently owned and operated. In fact, the composition of the retail marketplace is much more diverse than this.

Of the more than 165,000 motor fuel retail locations in the nation, refining companies only directly own and operate approximately five percent, and they are increasingly divesting their retail locations to focus attention further upstream. An additional 55 percent of all stores are owned and operated by independent businesses who have supply contracts to sell motor fuel under the brand of their supplying refiner. Hence, although they appear to be the retail location of the refining company, they are in fact independent. The remaining 40 percent operate without such branded supply contracts and choose to establish their own, private brand.

The Future of Renewable Fuels

Any discussion of the future of renewable and alternative fuels must begin by distinguishing the two. For example, the Energy Policy Act of 2005 established a renewable fuels standard ("RFS"), mandating that at least 7.5 billion gallons of renewable fuels be sold in the United States by the year 2012. The industry is well ahead of schedule in complying with

this mandate. Last year, the ethanol industry produced nearly five billion gallons, exceeding the four billion gallon target for 2006 as well as the 4.7 billion gallon target for 2007. By 2008, the standard requires blending of 5.4 billion gallons, which will easily be satisfied.

This feat is being accomplished through the widespread use of ethanol in concentrations up to 10 percent. You can find ethanol in most if not all gallons of reformulated gasoline and throughout conventional gasoline markets as a means to expand supply and boost octane.

Given the fact that industry is ahead of schedule, several Members of Congress have introduced legislation that will not only increase the mandate of the RFS, but also accelerate its introduction. Some legislation calls for the RFS to reflect a mandate of 8.5 billion gallons in 2008, expanding to 36 billion gallons by 2022. Another requires 10 billion gallons in 2010, growing to 35 billion by 2017. These are very ambitious goals, but we must ask ourselves if they are in the best interests of a nation so dependent on motor fuel supply.

The market is proceeding to offer renewable fuels ahead of the federally mandated schedule. There is no reason to believe that this will not continue in the absence of an increased mandate. However, if Congress feels compelled to accelerate this transition through a revised federal mandate, SIGMA and NACS call upon Congress to construct the revised program with the interests of consumers in mind.

Any increase beyond the existing RFS should be predicated upon a finding by the Secretaries of Energy, Agriculture, and Transportation that there will be sufficient supplies of renewable fuels available and sufficient distribution infrastructure to deliver that product to retail without placing an undue financial burden on consumers. If fulfillment of these preconditions cannot be assured, then the proposed increase should be delayed until conditions are sufficient to support its implementation. Further, such a decision should be made with enough lead time to

enable the petroleum industry to make necessary arrangements to accommodate the requirements.

SIGMA and NACS do not oppose the transition to a renewable fuels economy. We do, however, urge Congress in its decisions to be fully cognizant of the economic and consumer consequences associated with continuing mandates on the motor fuels business.

The Future of Alternative Fuels

As I mentioned, the discussion of renewable and alternative fuels should be separated because they involve very different requirements. The implementation of the RFS has been relatively seamless because the mixture of gasoline with up to 10 percent ethanol, or diesel with a small percentage of biodiesel, can be sold through existing fueling infrastructure to all consumers regardless of their vehicle type. It is upon this concept of infrastructure and vehicle compatibility that this Congress should focus when seeking to promote alternatives.

There are reported to be certain alternative fuels, such as renewable diesel or bio-butanol, that are believed to be completely fungible with the existing fuel supply and distribution system and compatible with the current storage infrastructure and vehicle fleet. Congress should be paying greater attention to such compatible alternatives than is currently being done. Introduction of such alternatives could prove to be seamless to the consumer and provide an immediate boost to our nation's energy sustainability.

This is not to diminish the value of existing alternative fuels and the roles they can play in the future of our motor fuels system. But with incompatibility comes increased marketing challenges. Products like bio-diesel blends above 5 percent and E-85 will contribute

significantly to our transportation economy, but they present significant challenges that this panel must understand.

To illustrate this issue and to discuss the challenges that face certain alternative fuels, I will be happy to present our industry views on E-85. Other alternative fuels proposals under consideration will present perhaps even more complex compatibility issues; we stand ready to assist the Committee in analyzing those barriers to consumer protection.

Cost to a Fueling Station to Sell E-85

The primary impediment to retailers converting a dispenser to E-85 is equipment compatibility. Because E-85 is more corrosive than regular gasoline or fuels with lower concentrations of ethanol, it requires equipment that is certified compatible with the fuel. At your April 18 hearing, it was mentioned that a retailer can convert a system to E-85 for as little as \$5,000.00. This is not very common. In fact, some retailers report having to sell E-85 at a loss in order to offer it for the same price as gasoline.

In preparation for this hearing, I have surveyed some of my colleagues in the industry to determine the range of costs that might be involved in a full conversion to sell E-85. Many of these stations have the newest equipment and, therefore, hold the best chance for existing equipment compatibility. I learned that newer steel tanks and fiberglass tanks were certified compatible with E-85. In addition, newer automatic tank gauges were listed compatible as were fiberglass piping systems. However, many would have to replace several of the ancillary fittings, including the submersible turbine pump, the overfill drop tube and others like flexible hoses, spill buckets, ball valves, and so forth. Moreover, hanging hardware, which includes conventional nozzles, swivels, breakaways and curb hoses would have to be replaced with nickel

plated units at an increased cost. For all of these conversions, including tank cleaning, I estimate the cost to be between \$8,000.00 and \$9,000.00.

Keep in mind, however, that this does not include converting the dispenser itself. The two dispenser manufacturers each charge an additional fee for E-85 compatible equipment -- \$8,000.00 for Dresser-Wayne and \$7,300.00 for Gilbarco. Thus, a typical E-85 dispenser can cost at least \$17,000.00 per unit, and often far more depending on regional variations.

It is conceivable to convert an existing dispenser, but this would require at a minimum replacing the meters, internal piping, filter inlets, compression fitting, control valves and seals, and any non-ethanol compatible sealants. I estimate such a conversion for these components to be in excess of \$5,000.00.

In short, to convert one of my newer stores to sell E-85, I would be facing an expense of something in the range of \$20,000, not including labor expenses. Assuming that a retailer can do such a conversion technologically, that's a bargain compared to the installation of an entirely new system for E-85.

I was recently quoted a price of \$75,000 to install a new E-85 system at one of my stations. Another member of SIGMA told me last week that he was quoted a price of over \$200,000.

Please keep in mind that the annual pretax operating profit for a convenience store in 2006 was just \$33,000. The infrastructure costs to install alternative fuel systems, therefore, are so substantial that ultimately consumers will have to pay the price.

In the Energy Policy Act of 2005, Congress provided for a tax credit to help offset the installation of alternative fueling infrastructure. This is helpful. In addition, many states have enacted their own incentive programs and Congress has been considering other legislation to

assist with the installation of alternative fuels infrastructure. While we support these initiatives, I would like to explain that cost is not the only impediment to retail availability of E-85.

If a retailer determines it makes economic sense to install an E-85 system, it is not necessarily feasible at every location. The requirement to dedicate an underground storage tank to the new fuel can be a limiting factor. Many stores operate only two tanks—one for regular unleaded and the other for premium. Mid-grade gasoline is often blended at the dispenser. Therefore, replacing one of these tanks is not an option. However, installing an additional tank may also be ruled out due to land availability or permitting restrictions. In short, some retailers may not be able to install a system to sell a distinct alternative fuel like E-85.

Finally, there is the fact that Underwriters Laboratories has not certified any dispenser to sell E-85. Until there is a certified dispenser, any retailer selling E-85 is at increased liability risk. Despite assurances by many local regulators to allow continued operation of existing facilities, retailers selling E-85 accept full liability for any problems associated with the dispensers. In fact, at least one equipment manufacturer requires customers to sign a waiver assuming all liability for these units. This is an important issue that must not be overlooked.

Demand: The Critical Chicken-and-Egg Factor

As I mentioned previously, retailers will sell whatever products their customers want to purchase. However, the number of flexible fuel vehicles (“FFVs”) on the market remains relatively small, limiting the potential market for sales of E-85 fuel. In addition, the number of those driving FFVs who realize they can purchase E-85 and choose to do so is even smaller. Some contend that the lack of E-85 use in FFVs is due to the limited availability of the product. This is the classic chicken and egg problem -- which should come first, supply or demand?

Predictably, retailers believe demand should precede supply. Let me explain why this approach makes sense for public policy as well.

Owners of FFVs have the ability to purchase either gasoline or E-85, without any affect on their vehicles. However, when a retailer chooses to sell E-85, the commitment is not as flexible. To offer E-85, as I have explained, requires a significant, long-term economic investment. In addition to the up-front conversion costs, the retailer is dramatically changing his business model.

Although there are some multi-hose dispensers with blender pumps selling E-85, most E-85 is sold through single-fuel dispensers. A typical gas station operates four dispensers, each providing two fueling positions. If E-85 replaces one of these dispensers, the retailer is effectively reducing his fueling positions by 25 percent. Therefore, unless consumer demand for E-85 is sufficient to ensure no reduction in customer traffic, retailers stand to lose valuable sales. It is important to realize that retailers generate most of their profit from inside the store sales. Therefore, a reduction in customer traffic to a location can dramatically affect overall store performance.

Consequently, it makes sense that retailers would be hesitant to make such an investment until there is sustained consumer demand in their market. Meanwhile, the drivers of FFVs are not denied the opportunity to purchase fuel because they have the option to buy gasoline. Hence, the chicken should come first. And, in fact, it is.

The auto manufacturers are increasing their production of flexible fuel vehicles. As more and more of these vehicles enter the market, demand for E-85 could potentially increase and change the economic calculations for retailers, resulting in more E-85 fueling stations in the nation.

Consumer Price Sensitivity

Another very important factor for this Committee, and indeed this Congress, to consider is that of price. Few other issues attract as much attention from consumers, the media, and Congress as does the price of gasoline. For retailers, the recent increase in wholesale prices have forced retail prices higher and with that comes the fear that lawmakers at the state level and here in Washington will consider legislation to curb retail price increases.

I mention this because the Congressional discussion about alternative and renewable fuels to date has focused on two issues: reducing America's reliance on imported energy resources and reducing emissions. Little attention has been paid to the cost at which these new fuels may be offered to consumers. Meanwhile, considerable attention has been paid to the price at which retailers sell gasoline. This disconnect must be corrected.

The transition to new fuels will not be without expense, and this expense will ultimately be borne by the consumer. But how much is too much? At what point will consumers reject the new fuel market because it negatively affects their personal economics? These are questions Congress must ask. Luckily, we have some indications today that can help guide Congress in this discussion.

NACS recently fielded a survey to assess consumer sensitivities to gasoline prices. This survey found that more than one-quarter of consumers will turn left across a busy intersection to save one penny per gallon and half of consumers will do so for three pennies. Additionally, one-quarter of consumers would drive 10 minutes out of their way to save three pennies. This indicates that consumers are extremely sensitive to retail gasoline prices. Retailers are then forced to compete on the basis of price differentials of a penny or two per gallon -- a very pro-consumer model.

What the NACS survey further reveals, however, is that what consumers say they will do and what they actually do is not always consistent. What real market data demonstrates is that while consumers want to promote a green economy, when they go to fuel their vehicles the only green that truly matters is the green in their wallets (or the balance on their credit cards, but we don't need to get into that issue today).

Consumers Are Not Paying Premiums for E-85

SIGMA and NACS have spoken with retailers throughout the nation who sell E-85, and we have learned that volumes of E-85 fall off dramatically when the price is not significantly lower (at least 20 cents per gallon) than gasoline. Some retailers, including one operating in Minnesota, report that the price differential to maintain volumes is actually closer to 40 cents per gallon. Unfortunately, it is not always possible for a retailer to price E-85 below gasoline.

Clearly, consumers have made the economic calculation regarding E-85 and they are demanding a benefit in price. Absent that benefit, they will follow their economic interests and purchase gasoline.

This is important for Congress and retailers to understand. Consumers act on the basis of their self-interest. Yes, they support a more independent and renewable energy sector, but only if it does not negatively affect them financially. Therefore, I urge this Committee not to ignore the economic interests of your constituents when considering legislation to promote alternative and renewable fuels.

Conclusion

The future of renewable and alternative fuels is a bright one, even without new government programs. As Congress considers policies to accelerate the market's transition, SIGMA and NACS encourage you to keep in mind the nature of the retail marketplace, remember the economic interests of your constituents, and provide safety valves to ensure minimal disruption to the system. Government mandates are antithetical to a free motor fuels marketplace and will only wind up harming consumers in the short run and beyond.

Again, thank you for the invitation to testify here today, and I will be happy to answer any questions which my testimony may have raised.

Mr. BUTTERFIELD. Thank you, Mr. Reid. Mr. Greco, I believe it is your turn for 5 minutes.

Mr. GRECO. Thank you, Mr. Butterfield.

Mr. BUTTERFIELD. Mr. Greco.

**STATEMENT OF ROBERT GRECO, GROUP DIRECTOR, DOWN-
STREAM AND INDUSTRY OPERATIONS, AMERICAN PETRO-
LEUM INSTITUTE WASHINGTON, DC**

Mr. GRECO. Mr. Butterfield and members of the subcommittee, API welcomes this opportunity to present the views of the U.S. oil and natural industry on renewable fuels. We have also welcomed working with both the subcommittee and the full committee on global climate change. As research on the policy debate continue, our member companies have taken action now to reduce greenhouse gas emissions and are investing and developing technologies that will reduce them further in the future. API supports voluntary technology-based approaches that have produced substantial progress toward reducing emissions.

Concerning renewable fuels, API supports a realistic and workable RFS. Our industry is the Nation's largest user of ethanol and is increasing the volume of renewable fuel in America's transportation fuel mix. The industry significantly exceeded the 2006 RFS requirement of four billion gallons of renewables and according to EIA estimates, should exceed the 2007 requirement as well. The existing RFS requirement have attracted substantial and significant investment capital to increase ethanol production. At the same time, innovative new approaches to producing and utilizing biofuels for transportation are underway.

The most economical and practical use of ethanol is as E-10, a 10 percent blend in gasoline. E-10 is already used in many parts of the country. It requires no modification to vehicles, no major changes to service station pumps and storage tanks, and has a long history of successful use by consumers. E-85, which contains 85 percent ethanol and 15 percent gasoline, is an alternative fuel that faces significant technological and economic hurdles. E-85 requires specially built flexible fuel vehicles, or FFVs, which currently comprise only 3 percent of the existing fleet of 220 million vehicles. EIA estimates that FFV penetration will not rise about 10 percent of the entire vehicle fleet until sometime after 2030. E-85 also requires special service station pumps and storage tanks, as Paul mentioned, which represent a significant expenditure for our Nation's independent service station dealers that can range from \$20,000 to as high \$200,000.

These small businessmen and women are in the best position to evaluate consumer demand for E-85 at their service stations. Currently there are over 1,200 retail outlets nationwide, located principally in the Midwest, that are equipped to distribute E-85. The number appears to be growing rapidly on its own, as we heard this morning, absent any government mandate. Contrary to the false claim by some industry critics, oil companies are not preventing the installation and use of E-85 pumps and storage tanks.

Although no one knows the precise amount, at some point in the not too distant future, limits on domestic corn ethanol production will be reached. Too little attention is being paid to the transition

from that point forward, especially on impacts associated with a delay in mass-scale production of cellulosic ethanol. Given the limited likelihood that cellulosic technologies can begin producing sizeable volumes of ethanol in 5 years, contingency provisions will likely be needed to avoid the potential for wasted resources and increased costs.

API offers these specific comments concerning possible renewable fuels by—first, restrictions on Federal requirements in the Energy Policy Act of 2005, or EPCA, should continue. A Federal alternative or renewable fuels mandate should not have a per gallon requirement, it should not require any particular alternative fuel to be used to meet that mandate, it should not require an alternative fuel to be used in any particular geographic area, and should not require an alternative fuel be made from a particular feedstock or restrict the use of any feedstock or processing speed.

Second, States and localities should be preempted from setting alternative or renewable fuels mandates. There should be an explicit and complete Federal preemption of States from setting alternative fuel standards or controls of any type. Or in lieu of an explicit preemption, restrictions on State latitudes could be enacted.

Third, EPA should be provided the additional authority to grant temporary waivers during supply emergencies. There should be Federal preemption of existing State fuel and ASTM performance regulations when a waiver is issued during a supply emergency, such as happened during the Hurricanes Katrina and Rita. There should be emergency waiver of authority for up to 90 days. The 20-day limit for waivers provided in EPCA is adequate for most situations, but proved inadequate during Hurricanes Katrina and Rita. Waiver authority should also remain with the EPA Administrator. To change authority to the President would prevent speedy implementation of waivers, as was intended under EPCA.

Lastly, any mandates for increased alternative or renewable fuel usage should get accompanied by periodic technology and feasibility reviews that would allow for appropriate adjustments to ensure that energy companies and consumers are not penalized if economic and technical hurdles prevent us from reaching alternative or biofuels usage targets.

In conclusion, API and its member companies stand ready to work with the subcommittee to provide additional information or assistance on the issues I have addressed. Thank you and I look forward to your questions.

[The prepared statement of Mr. Greco follows:]

**Statement of Bob Greco, API Group Director, Downstream
and Industry Operations, before the House Energy and
Commerce Subcommittee on Energy and Air Quality**

May 8, 2007

I am Bob Greco, Group Director of Downstream and Industry Operations of API, the national trade association of the U.S. oil and natural gas industry. API represents more than 400 companies involved in all aspects of the oil and natural gas industry, including exploration and production, refining, marketing and transportation, as well as the service companies that support our industry.

API welcomes this opportunity to present the industry's views on renewable fuels and proposals to expand the Renewable Fuels Standard (RFS) and renewable fuels use. However, before I address these issues, I will briefly present the industry's views on another issue of direct concern to your Subcommittee, climate change.

Our industry acknowledges that climate change is a very important global issue. The people of America's oil and natural gas industry are working to improve energy efficiency and thus help curb greenhouse gas emissions today and to develop the technologies to help curb emissions further in the future.

While API supports voluntary, technology-based approaches – which have produced substantial progress towards addressing greenhouse gas emissions – API nonetheless

believes that all stakeholders should remain open-minded, and that all policies to address climate change should be carefully considered in a public, transparent and informed debate.

API believes that any climate change policy should:

- Be environmentally effective;
- Promote advanced, energy-efficient technologies and sequestration options as part of a long-term, cost-effective strategy, without government selection of “winners and losers”;
- Promote a positive investment environment that allows for rapid development and deployment of energy-efficient and emission-reduction technology;
- Equitably treat the emissions from all sources of greenhouse gases economy-wide;
- Carefully weigh the potential consequences of any policy that would make energy producers responsible for emissions outside their control (i.e., consumer emissions);
- Provide access to all domestic energy sources, including natural gas which will face increased demand;
- Be transparent and understandable to consumers and all stakeholders;
- Support economic growth and avoid damage to the economy posed by ineffective policies involving unrealistic near-term emission targets and timetables;
- Promote adoption of advanced, energy-efficient technologies in the developing world, while protecting property rights;

- Promote global participation, including by developing countries, to address this challenge cost-effectively; and
- Keep U.S. energy production competitive in the global marketplace.

Even as research and policy debates continue, our member companies are addressing climate change in diverse ways and investing considerable resources into low- and zero-emission technologies. In 2002, under the federal government's Climate Vision program, API members pledged to improve energy efficiency in their refineries by 10 percent in 10 years. We are five years into the "10 in 10" program and our members are on track to meet that goal. The energy saved in 2004 alone was equivalent to taking more than 350,000 vehicles off the road, or the electricity for more than 710,000 homes.

We also support increased public education by both the federal government and the private sector on all aspects of policies to address climate change, including the importance for all stakeholders and the public to use energy as efficiently as possible.

Let me turn now to renewable fuels. For centuries, energy and food have been the engines that have raised mankind from poverty, particularly in the developing world. To give a family food, warmth, mobility, and a job is to progress toward a more stable world and to nurture an improving standard of living for every man, woman and child.

The International Energy Agency forecasts that world-wide energy demand will increase by 50 percent between now and 2030. For those of us involved in the energy business for

well over a century, one stark conclusion flowing from this forecast stands out – our world, and our nation, will need all commercially viable energy sources for decades into the future, including both fossil and alternative energy sources.

Our companies have long been pioneers in developing alternatives and expanding our use of existing sources of energy. From 2000 to 2005, the U.S. oil and natural gas industry invested an estimated \$98 billion in emerging energy technologies, including renewables, frontier hydrocarbons such as shale, tar sands, and gas-to-liquids technology. This represents almost 75 percent of the total \$135 billion spent on emerging technologies by all U.S. companies and the federal government. Our companies are actively investing in second generation biofuels research, such as cellulosic ethanol and biobutanol and, weekly, we hear of new and exciting approaches to expanding the use of biomass in the motor fuels markets.

Given this huge, global appetite for energy, energy security, not “energy independence,” should be our nation’s energy framework going forward. Brazil’s achievement of energy independence has been cited as a model that the U.S. should emulate. However, it is important to note that Brazil achieved energy independence through an increase in offshore oil production. Its domestic ethanol usage has not increased substantially in the last 10 years.

Today, the U.S. oil and natural gas industry provides two-thirds of all the energy consumed each year by our nation. However, we import more than 60 percent of our oil

in order to meet consumer demand. The United States must do everything it can to access a diversity of resources around the world. "Energy independence" would be at odds with this objective. For all the talk of the need to wean ourselves from Arabian Gulf oil, the fact is the amount of Arabian Gulf oil imported has been substantially unchanged for years. Our real supply security depends on international trade. Our Arabian Gulf partners provide important supply -- but they are only one source, representing less than 20 percent of total imports.

As we take steps to meet the energy needs of future generations, we must focus on three areas: meeting growing demand, improving energy efficiency and environmental performance, and developing new energy technologies.

- First, we must continue to meet our nation's growing energy needs through diverse sources of oil and natural gas supplies both here and around the world, while alternative and renewable sources continue their rapid rates of growth;
- Second, American industry must continue to increase its energy efficiency and the American public should be encouraged to become more energy efficient; and
- Third, we must develop new technologies to find and produce increased oil and natural gas supplies, improve energy efficiency and environmental performance, and develop new economic sources of renewable energy.

The current Renewable Fuels Standard (RFS) has stimulated substantial investments to increase biofuels supplies, particularly ethanol, beyond that required to satisfy the RFS. In addition, research into advanced production methods and alternative fuels is underway.

Last year, our industry utilized 25 percent more than the target amount of ethanol established under the RFS. Additionally, nearly 50 percent of all gasoline consumed in the U.S. now includes ethanol.

Thanks to the almost seamless transition of huge amounts of ethanol into our nation's gasoline pool, ethanol is gaining broader consumer acceptance. From our experience, we know that customer acceptance is the single most important factor in the success of a product, especially a transportation fuel. It is even more essential that we maintain and build the consumer acceptance of ethanol.

In assessing policy options to further increase alternative fuels usage, reliance on market forces is the best way to satisfy our growing fuel requirements. This will ensure reliable supply and deliver the greatest value to consumers. Policies should be performance-based and provide a level playing field for all energy options, including renewable/alternative fuels. We should not favor one specific technology over another or create unsustainable or uneconomic solutions. Moreover, our policies should be feedstock neutral.

In addition, government should not over-promise on the potential of renewables to reduce petroleum demand. Overestimates create unrealistic expectations, poor policy and wasted resources. Government policy should strive to encourage sustainable and competitive second generation biofuels technologies.

The most economic and practical use of ethanol is E-10, which should be maximized before considering higher ethanol blends. This fuel is already used in many parts of the country. E-10 requires no modifications to vehicles, no major changes to service station fueling equipment and tankage, and has a long history of successful fuel use by consumers.

The existing infrastructure/distribution system should continue to expand and be utilized to the extent practicable. The industry was stretched last year in maximizing ethanol integration into the national gasoline pool, due in part to a tight wholesale delivery infrastructure, that is, the terminals and blending facilities needed for ethanol, along with rail cars and rail spurs. The growth in infrastructure must keep pace with consumer demand.

Widespread use of E-85, however, would require that the major technological and economic hurdles of cellulosic ethanol conversion first be overcome. The timing of such technological breakthroughs is highly speculative. Even with breakthroughs in cellulosic ethanol production technology, significant logistical hurdles will need to be addressed. Gathering the feedstock (biomass such as forestry waste and switch grass), processing it, disposing of “waste” products, and delivering ethanol to markets at a cost comparable to gasoline has yet to be demonstrated on a commercial-scale.

E-85 use is also constrained by a number of additional factors. Corn-based ethanol is not sustainable at levels that would support widespread use of E-85. Moreover, E-85 requires

flexible-fuel vehicles which currently comprise only 3 percent of the existing vehicle fleet. EIA estimates that the flexible fuel vehicle (FFV) share of the vehicle fleet will not rise above 10 percent until sometime after 2030. Even in 2030, new owners of FFVs, like many of the current owners, might fill up with E-10 rather than E-85.

According to EPA, FFVs get about 30 percent fewer miles per gallon when fueled with E-85 as compared to gasoline. Consumers will likely be unhappy with the mileage penalty of E-85.

E-85 also requires special service station pumps and storage tanks, which represent a significant expenditure by the nation's independent service station dealers. More than 90 percent of the 169,000 retail gasoline stations nationwide are owned or operated by independent entrepreneurs – typically small businessmen and women. They are in the best position to evaluate consumer demand for E-85 at their retail stations. They will have to determine whether to offer E-85, balancing customer demand with per-station investment and conversion costs that can range from \$20,000 to over \$200,000.

Currently, there are just over 1,000 retail outlets nationwide, located principally in the upper Midwest, that are equipped to distribute E-85. The number appears to be growing rapidly on its own, without any government mandate. Contrary to the false claims by some industry critics, oil companies are not preventing the installation and use of E-85 pumps and storage tanks.

Indeed, there are a number of cooperative endeavors underway between our industry and other biofuels stakeholders, including ethanol interests. Examples include:

- Our members are working with their counterparts in the biofuels and automotive industries to help ASTM International review and recommend changes to update E-85 fuel quality specifications, and also to help establish fuel quality specifications for biodiesel blends;
- Together with automakers and regulatory agencies, API and its members are working to better understand the emissions and performance characteristics of modern technology, flexible fuel vehicles (FFVs) operated on E-85 and on intermediate ethanol blends;
- API members and automobile manufacturers are jointly engaged in research to gain further insights as to the emission, drivability and materials compatibility characteristics of vehicles that have been operated on gasoline blends containing higher ethanol concentrations; and
- API has supplied information to Underwriters Laboratories, DOE, and others that provides a baseline for materials compatibility requirements to help develop the information needed for certification of E-85 dispensing equipment.

In increasing biofuels usage, the government should address secondary impacts including the impact on food supplies and the environment (for example, water use and water quality degradation, pesticide use, and increased VOC/NO_x emissions).

With regard to the impact on food supplies, in an April 30, 2007 joint letter to Senate Energy and Natural Resources Committee members, the Grocery Manufacturers Association (GMA) and Food Products Association (FPA) said: "...it is important to note that the very aggressive ramp-up of the biofuels mandates proposed in S. 987 raises very basic concerns about the impact continued expansion of corn-based ethanol will have on the food industry's ability to continue to provide reliable and affordable food to the nation and other markets."

Because of the potentially widespread effects on the environment, regulatory agencies will need to develop metrics for assessing the life-cycle impacts and benefits from possible large-scale increases in biofuels use. In addition, government policy should encourage the utilization of the existing national refinery infrastructure for the co-processing of renewable feedstocks that can result in products with a renewable content compatible with the existing fuel distribution infrastructure.

State-by-state ethanol mandates create additional boutique fuels, interfering with the reliable supply of fuels during supply disruptions and increasing distribution costs. State-by-state mandates also conflict with the flexibility and efficiencies provided in EPACT05 with respect to where biofuels are supplied and product type. Just last month, for example, an eighth state passed another, different biofuels mandate. Congress recognized the potential problems from the proliferation of gasoline boutique fuels and blocked their expansion in the EPACT05. In that same legislation, the Renewable Fuels Standard

stresses maximum fuel flexibility. Congress now needs to address the newest type of boutique fuels – those required by state biofuels mandates.

Another example of restrictive state requirements is found in the Southeastern U.S., where most states fail to provide exceptions or modifications to their gasoline standards to accommodate ethanol's impact on fuel volatility. As a result, refiner/marketers face potential non-compliance with state gasoline standards if they blend ethanol with fungible conventional gasoline. Tailoring the base fuel at the refinery to assure compliance by the finished blend would reduce gasoline supplies and increase fuel cost, thereby removing any incentive to blend ethanol.

Although no one knows the precise ceiling number, at some point in the not too distant future, limits on domestic corn ethanol production will be reached. Too little attention is being paid to the transition from that point forward, especially impacts associated with a delay in mass-scale production of cellulosic ethanol volumes. There is a very limited likelihood that cellulosic technologies can begin providing sizable volumes of ethanol in five years. If Congress acts to increase the RFS despite these limits, short-term and long-term contingency provisions will be needed to avoid the potential for wasted resources and increased costs.

Thus, all mandates for increased renewable fuel usage should be accompanied by periodic technology/feasibility reviews, with appropriate lead times. These reviews would allow for proper adjustments so that energy companies and consumers are not

penalized due to the economic and technical hurdles that might prevent reaching biofuels usage targets or goals. Any mandates for increased renewable fuel usage should also include provisions that suspend requirements for increased biofuels usage in the event of significant supply or distribution disruptions.

While we have made progress over the past year, important questions remain. These must be thoroughly and responsibly addressed if we are to build on our joint progress and ultimately realize the full potential for ethanol within our nation's transportation fuels portfolio.

EPA recently finalized the regulations to implement the Renewable Fuels Standard (RFS). API welcomes the finalization of EPA's credit trading program, a key component of the RFS. The credit trading program provides sufficient flexibility for refiners and gasoline importers to meet the RFS while meeting U.S. energy needs.

We appreciate the effort that EPA made in involving all stakeholders in the development of these regulations. Flexibility in implementing the national RFS is essential in order to integrate ethanol into the nation's gasoline pool in the quickest and most effective way possible.

API also offers these comments concerning possible biofuels legislation that may be considered by the Subcommittee, including proposals to expand the RFS:

1. Restrictions on federal requirements in Energy Policy Act of 2005 (EPACT05) should continue.

- A federal alternative or renewable fuel mandate should not:
 - Have a per-gallon requirement;
 - Require any particular alternative fuel to be used to meet a mandate;
 - Require an alternative fuel to be used in any particular geographic area; and
 - Require an alternative fuel to be made from particular feedstocks or restrict the use of any feedstock or processing scheme.

2. States (and political subdivisions thereof) should be preempted from setting state alternative or renewable fuel mandates.

- There should be an explicit, complete federal preemption of states from setting standards/controls of any type for alternative fuels.
- An alternative would be to set out restrictions on the states in lieu of an explicit preemption.

3. EPA should be provided with additional authority to grant temporary waivers during supply emergencies -- EPACT05 section 1541(a)

- There should be federal (EPA) preemption of existing state fuel and ASTM performance regulations when a waiver is issued during a supply emergency. During Hurricanes Katrina and Rita, EPA waived certain federal fuel requirements promptly to increase fuel supplies. However, in many cases, state action was also required and frequently was not prompt. The result was unnecessary delays in increasing fuel

supplies. EPA should be provided with authority to waive both federal and state environmental and product quality fuel requirements during "an event of national significance" (in situations where a state adopts its own product quality regulations and situations where states adopt ASTM specifications)

- There should be emergency waiver authority for up to 90 days. The 20-day limit for waivers provided in EPCACT05 is adequate for most situations but proved inadequate during Hurricanes Katrina and Rita. Thus, the timeframe for waivers should be increased to "up to 90 days" for an event of "national significance" so designated by the President. This increased time will provide much needed flexibility in terms of arranging for additional fuel supplies, particularly longer lead time product imports.
- Waiver authority should remain with the EPA Administrator. EPCACT05 language should be retained so that the EPA Administrator – not the President – has authority for fuel waivers and preemption of state regulations. To change authority to the President would prevent speedy implementation of waivers, which is what was intended.
- Additional adjustments should be made to the emergency waiver language in EPCACT05. EPA interpretation of the waiver language has caused some confusion and concern regarding supplying waived fuel. Several changes to the waiver language would help to correct these problems.

4. Alternative fuel technology review should be required with a report to Congress and adjustment of the alternative or renewable fuel standards and phase-in schedule.

- Any mandates for increased alternative or renewable fuel usage should be accompanied by periodic technology/feasibility reviews that would allow for appropriate adjustments so that energy companies and consumers are not penalized due to the economic and technical hurdles that might prevent reaching alternative or biofuels usage targets or goals.

Finally, there has been much interest recently in “low-carbon” fuel. It is important to recognize that the carbon content of gasoline can’t be reduced. Low-carbon fuels have “low” greenhouse gas emissions as compared to gasoline.

A low-carbon fuel mandate would essentially be an alternative fuel mandate. It would be the same as an advanced biofuels mandate. Compliance with such a mandate will require the development of alternative vehicles and fuels that are not yet economic, such as cellulosic ethanol, plug-in hybrids, and hydrogen fuel cells. Only cellulosic ethanol-based E-85 (not corn-based E-85) will deliver significant carbon benefits and it is uncertain when cellulosic technology will be economic.

The carbon content of a fuel will likely be measured using a life-cycle analysis. This is the approach that California plans to use. There are various estimates of GHG emissions of biofuels found in the literature. A comparison of estimates across studies reveals differences in both the magnitude and sign of emission impacts reflecting the significant uncertainty that exists in the estimates as well as differing assumptions employed in the studies. Because of the energy involved in the corn crop, ethanol production and the

transport of ethanol to terminals for marketing, corn-ethanol has limited “low-carbon” benefits.

In summary, the U.S. oil and natural gas industry continues to make good progress in meeting our nation’s growing energy needs and improving environmental performance. Looking ahead, we need to develop all economically viable energy sources including fossil and renewable fuel sources. By relying, to the greatest extent possible, on market forces, understanding consumer impact and preferences, encouraging development of new technologies, and addressing the impacts of expanded renewable fuel usage, I am confident that our industry and the nation will meet the energy challenges in the years ahead.

API and its member companies stand ready to work with the Subcommittee and to provide whatever additional information or assistance we can on the issues I have addressed, as well as other related issues that may arise during the course of Subcommittee deliberations.

Mr. BUTTERFIELD. Thank you very much. I am going to expedite this. We have three votes coming up in a few minutes. Mr. Drevna.

STATEMENT OF CHARLES T. DREVNA, EXECUTIVE VICE PRESIDENT, NATIONAL PETROCHEMICAL AND REFINERS ASSOCIATION, WASHINGTON, DC

Mr. DREVNA. Congressman Butterfield and members of the committee, thank you for the opportunity to testify. I am Charlie Drevna, executive vice president of NPRA.

NPRA believes it imperative that Congress and the administration and all stakeholders work in a determined but nevertheless cooperative effort to develop policy that achieves the desired results of a balanced fuel supply and demand ratio that enforces necessary environmental protections. At the same time, these policies must ensure the continued economic growth and security of the country. These goals are not and cannot be deemed mutually exclusive. NPRA therefore pledges to do our part in developing a full understanding of all factors surrounding these issues.

If members of this committee are experiencing some sense of déjà vu, it would be understandable. Only two summers ago the Energy Policy Act of 2005 was signed into law. The Renewable Fuel Standard in that law won't even begin implementation until September 2007—weeks ago. But it is still too early to evaluate the 2005 law. That policy was years in the making and was consensus-based. While we have surpassed initial legislative targets for renewable fuels use, that is not bad news. It simply means that the market has worked. It shouldn't be used as a basis for readjust fuel policy even before final implementation.

Now we are confronted with new initiatives to expand renewable fuel substantially. While a diverse fuel mix may enhance security, the energy content of ethanol, one-third less than conventional fuels it replaces, greatly reduces ethanol's impact on foreign dependency. Our experience with the fuel market tells us that 6 billion gallons of ethanol is both necessary and complimentary to fuel supply. Mandates, and I stress the word mandates, beyond that level become problematic.

While it is no secret that my industry, and especially my association, has a history of proposing fuel mandates. We would ask that further changes to policy be limited by a form of the Hippocratic oath: first do no harm. Mandates for alternative fuels do not exist in a vacuum. The time and expense dedicated to implementing new mandates directly competes with the ability of our industry to make investments in refinery expansions. The industry has responded by adding capacity to existing refineries. In fact, we have added the equivalent of one new world-class refinery each of the past years, each of the years for past decade. However, additional mandates may suppress such expansion significantly.

While NPRA supports research into a broad array of renewable inputs, the foreseeable future for alternative fuel seems to be dominated by traditional starch-based ethanol, especially by corn and corn has a significant head start over its competitors. Even if corn only meets half of the President's 35 billion target, that would require dedication of about 40 percent of the crop to fuel. We wonder whether trading some increased fuel diversity for a fuel supply de-

pendent upon good weather and reasonable fuel prices really makes sense.

And of course, even as the U.S. gets the production economics just right, there is still a question of distributing fuel to market. Ethanol distribution is bedeviled by problems in using our existing infrastructure pipelines that provide a cost-effective mechanism to get fuel to market. Talk of a virtual pipeline system really means no pipeline system at all. Further, even assuming perfect distribution to the market, the current vehicle base is not equipped to handle the type of volume that is being discussed. In order to consume the 35 billion gallons, we would need rapid replacement of some 237 million vehicles currently on our roads that are not flex-fuel vehicles.

There are additional infrastructure constraints and time—I want to move on here so we will probably have some questions on those. But NPRA would leave the committee with one request. If Congress does proceed with mandates beyond those contemplated in the 2005 Act, let us make sure we have one fair Federal policy and not a patchwork quilt of State and Federal mandates. As it did in the Clean Air Act Fuels Program, Congress should preempt State efforts that interfere with the cost-effective distribution of clean fuels.

In short, the refining industry is the conduit through which alternative fuels may get to market. The industry is working hard to meet the 2005 program and so far, it has so far met with success. But we would ask that you not use that success as the basis for massive expansions and mandates. We ask instead that policy-makers tread carefully, realizing that good fuels policy must balance supply, price, infrastructure and yes, even food concerns. While we realize that is a tall order, the American consumer deserves no less. Thank you and I will be happy to answer any questions that you may have.

[The prepared statement of Mr. Drevna follows:]



Written Statement of the
National Petrochemical & Refiners Association

delivered by
Charlie Drevna
Executive Vice-President, NPRA

before the
Subcommittee on Energy and Air Quality
Committee on Energy and Commerce Committee

concerning
Alternative Fuels: Current Status, Proposals for New Standards, and
Related Infrastructure Issues

May 8, 2007
Washington, DC

Chairman Boucher, Ranking Member Hastert, and members of the Energy and Air Quality Subcommittee, NPRA, the National Petrochemical & Refiners Association, appreciates the opportunity to present its views on Alternative Fuels: Current Status, Proposals for New Standards, and Related Infrastructure Issues. I am Charles Drevna, NPRA's Executive Vice President. Our testimony today will concentrate on how these three distinct, but nevertheless directly related factors, have impacted/will directly impact the current and projected gasoline supply and the specifications which refiners have been or may be obligated to achieve. As you know, NPRA is a national trade association with 450 members, including those who own or operate virtually all U.S. refining capacity, as well as most of the nation's petrochemical manufacturers with processes similar to those of refiners.

INTRODUCTION

Continued uncertainty and instability in the motor fuel market is a concern that is shared by the domestic refining industry. NPRA believes it imperative that Congress, the Administration, and all stakeholders work in a determined, but nevertheless cooperative effort to develop policies that achieve the desired results of a balanced fuel supply and demand ratio that affords necessary environmental improvements. At the same time, these policies must ensure continued economic growth and security. These goals are not and can not be deemed mutually exclusive. NPRA therefore pledges to do our part in developing a fuller understanding of all factors surrounding these issues.

THE RENEWABLE FUELS STANDARDS OF EPACT '05

The Energy Policy Act of 2005 (Public Law 109-58) includes a renewable content requirement for motor vehicle fuels, the Renewable Fuel Standard (RFS) provision (see section 1501). The RFS called for 4 billion gallons of ethanol to be blended into gasoline in 2006. The amount of ethanol used is scheduled to increase each year through 2012, where it is targeted to reach 7.5 billion gallons.

By February 2007, ethanol consumption was running at a rate of nearly 400,000 barrels per day, equivalent to an annual consumption rate of 6.1 billion gallons. This rapid growth in demand for ethanol during the year (comprising approximately 4.3% of the gasoline pool in February 2007) reflects its established role as part of the transportation fuel supply mix.

Therefore, actual use patterns outpaced the EPACT '05 ethanol mandates. This success suggests that policymakers may have underestimated ethanol's inherent potential. This outcome could have provided the context for the President's and other proposal to greatly expand the government renewable fuels mandate to 35 billion gallons; growing ethanol consumption from current levels of 400,000 barrels per day to 2.28 million barrels per day—a 6-fold leap.

EPA has developed a reasonable framework for the RFS program

The RFS is administered by EPA and on April 10, 2007, EPA released comprehensive RFS standards. They were promulgated on May 1, 2007 (72 FR 23900). The regulatory program will begin on September 1, 2007. The Renewable Fuel Standard for 2007 is 4.02%. The RFS for 2008 will be announced by EPA in November 2007.

NPRA appreciates the constructive interaction with EPA during this rulemaking. I commend EPA for its facilitation of early engagement, cooperative efforts, and open discussion involving all stakeholders. NPRA believes that the final regulations are flexible, workable and enforceable. The Agency disagreed with NPRA on some provisions, but the final rules do provide a reasonable regulatory framework that is consistent with the legislative provisions in the 2005 energy bill.

NPRA has agreed to sponsor a workshop on May 10 where all stakeholders, i.e. obligated parties (refiners, blenders and importers), renewable fuel producers, and others will have the opportunity to discuss with the Agency all aspects of the rules. In addition, EPA is preparing a fairly detailed question and answer document to further inform stakeholders.

At this point, it is still too early to evaluate this program. However, NPRA believes that the implementation of the RFS program is off to a good start. It is worthy to note, however, that the refining industry will have, over the first two years of the program, surpassed the statutory minimums for blending of renewables. It is further anticipated that refiners will continue to exceed the minimum requirements over the next several years. We believe this affirms our stated position that mandates are unnecessary and that a fuel supply, transportation and distribution system based on free market principles should be the option of choice.

PROPOSALS TO VASTLY INCREASE THE CURRENT RFS

The Issue of Energy Security

The administration and many in Congress have rolled out several energy policy initiatives that would substantially expand the use of ethanol and other renewable fuels for the U.S. transportation sector. These actions are a direct reply, and viewed by its proponents as an effective policy response, to a domestic transportation fuel market that has experienced much volatility and uncertainty in recent years. The administration's proposal would increase the annual U.S. consumption of ethanol and related bio-fuels to 35 billion gallons by 2017. According to the Energy Policy Research Foundation, this proposal, when fully implemented and under a best-case scenario, would reduce petroleum imports by 1.5 million barrels per day. This number reflects the metric that if the 35 billion gallon per year goal were to be attained, it would by volume alone replace 2.25 million barrels of imported oil with domestically manufactured fuel. However, since ethanol contains only two-thirds the energy content of petroleum, the oil import savings would be a little as 1.5 million barrels per day. This would not appreciably alter the nation's dependence on foreign oil, which DOE forecasts to be nearly 13 million barrels per day in 2017.

For the U.S. gasoline pool, it is estimated that about 6 billion gallons of ethanol is both essential and complimentary to the domestic production of gasoline. Without these volumes of ethanol available for blending with gasoline, the domestic refining industry would likely have difficulty meeting consumer demands.

Refinery Capacity Expansion Projects

It should be clearly understood that requirements to substantially increase the volume of ethanol and other renewables will essentially supplant a significant portion of the need/desire for additional domestic refining capacity. Refiners must make investments today on what they believe to be the longer-term (10-15 years or more) outlook. The domestic refining industry is likely to look upon rapidly rising ethanol and other bio-fuels requirements in the coming years as adding significant more risk to investments in capacity expansions. As recently as 2006, the Department of Energy (DOE) forecast that domestic refiners were likely to add 1.5 million barrels per day of capacity between 2006-2010. Based upon perceptions of renewable market developments – developments being stoked by administration and congressional actions – current estimates suggest that expansion in the domestic refining is likely to be constrained well below 1 million barrels per day. These decisions are being re-visited in boardrooms across the refining sector as the anticipated surge in ethanol requirements/mandates in the coming years will pressure domestic, and undoubtedly some foreign refiners currently supply the U.S. market to postpone or cancel new investments in petroleum refining capability.

To illustrate the point further, the President's proposal which calls for use of 35 billion gallons per year of renewable fuels, primarily ethanol, also requires a 20% reduction in the use of gasoline by the same time. The Energy Information Administration projects that gasoline demand in 2017 will be 161 billion gallons. A 20% reduction of this figure would result in 129 billion gallons of gasoline. In 2006, U.S. production of gasoline was 136 billion gallons and net imports of finished gasoline equaled 7 billion gallons. Therefore, the target for gasoline use in 2017 is below today's U.S. production levels.

This would transform the U.S. from a net importer to a net exporter of gasoline. Meanwhile, demand for other petroleum-based fuels such as diesel is still expected to increase. If U.S. refiners expand capacity to meet rising demand for petroleum products other than gasoline, they will naturally produce more excess gasoline for export at the same time. A fundamental policy question regarding the efficacy of exporting domestic supplies of transportation fuels under the guise of reducing domestic consumption of that same fuel under a continuing supply/demand imbalance must be addressed.

Basic Economics

Existing law extends the 51-cent per gallon ethanol fuel blender tax credit (the equivalent of \$21.42 per barrel of gasoline) through 2010. It is likely that Congress will extend this particular provision, as many facilities will be under severe financial stress absent the blender credit. The costs of this program to the U.S. Treasury are not trivial, however. Assuming that the blender credit remains in place, it will cost the federal government about \$30 billion between 2007 and 2012. These are direct tax losses to the U. S. Treasury and do not include indirect cost to the U. S. consumer. During 2006, for example, indirect consumer costs from higher corn and other agricultural product prices impacted by increasing ethanol consumption amounted to about \$5 billion, twice the cost of the tax credit itself to the U. S. Treasury.

Energy “Security” Trade-Offs

Other entities impacted by large increases in the price of corn directly related to the increased and increasing use of ethanol in the transportation fuel mix have or will have discussed their concerns with Congress. While NPRA shares their concerns, we do not portend to speak for them. It is important, however, to note the security concern regarding potential supply impacts from increased reliance upon corn production, which is subject to periodic disruptions from weather-related events. Imported oil may very well have geo-political security concerns of its own, but transferring dependency on a commodity that can be severely impacted by a number of uncontrollable events (drought,

storms, heat waves, etc.) creates a new dimension of uncertainty to energy supply reliability. To mitigate these impacts of these undesirable but likely events, undefined proposals of “off-ramps” have been offered. These off-ramps would, in theory, absolve obligated parties from compliance with statutory and implementing regulatory requirements in times of these episodic events. However, the obligated parties will have made the substantial investments required to comply with the renewable mandates on a going-forward basis. It could require substantive operational and process modifications in order to deliver a product containing less or no renewable content while still meeting all other applicable criteria. These modifications can not be done quickly and the impact on overall supply will be direct, thus resulting in the exact opposite goal of enhancing U.S. energy security.

INFRASTRUCTURE REQUIREMENTS/CONCERNS

Although ethanol has been used in U.S. motor fuel supply since the 1970’s, various government efforts to promote its broader use have not gained traction until this decade. As previously discussed, enactment of EPACT ’05 resulted in a mandate to blend increasing amounts of ethanol in gasoline—7.5 billion gallons by 2012. With the somewhat sudden phase-out of MTBE one year later, ethanol’s role of a vital component of gasoline had been realized. In February 2007, ethanol realized an annual consumption rate of 6 billion gallons, far surpassing EPACT requirements and approaching the 2012 mandated levels.

This large scale and seemingly successful integration of ethanol into the motor fuel has been followed by new proposals that dwarf the existing requirements for blending of renewable fuels. These new proposals are expected to be met primarily through the use of ethanol. Recent reports and discussion have indicated that there is general agreement that corn-based ethanol can only supply less than half of the 35 billion gallons per year of renewable production called for by the President’s proposal. NPRA believes that the operative question should not be one of can corn supply nearly 15 billion gallons of ethanol for blending into gasoline, but rather should it? This volume, according to most

estimates, would require that approximately 44 per cent of the corn crop be dedicated to ethanol production. One must question whether this represents sound, sustainable energy policy in lieu of other considerations.

Further, it is unclear how a vehicle base that is currently unable to use even half this amount (35 billion gallons) could consume this much ethanol. In order to use all of the 35 billion gallons per year of ethanol production, far-reaching and rapid replacement of the 237 million vehicles now on the nation's roads with flexible fuel vehicles (FFV) would need to take place. This would further require that a large portion of the approximate 17.5 million vehicles sold annually must transition to FFV's very quickly if ethanol use is to grow to levels envisioned by these and other proposals.

There are also numerous other challenges that must be overcome before this much ethanol could be integrated into the U.S. transportation fuel supply. Among them is the lack of a robust transport system to provide universal distribution, the availability of 13 billion bushels of corn to manufacture this amount of ethanol, and a much-needed but yet unrealized technology breakthrough to manufacture ethanol from cellulosic plant material.

Ethanol Versus Petroleum-Based Fuel

Looking at some of these matters in more detail, ethanol had to overcome a number of difficulties in order to gain its present position in the fuel supply chain. To some extent, these challenges have not been overcome and will be exacerbated if calls for the massive increase in its use are implemented.

Ethanol cannot be transported through mixed-use pipeline systems or other traditional infrastructure. Ethanol is not distributed through pipelines because of problems with water contamination and corrosion. Due to its water solubility, ethanol drops out of fuel during shipment through pipelines and results in noncompliant or substandard fuel. Ethanol's corrosive properties degrade the strength of pipeline valves and joints. For

these reasons, ethanol must be blended with gasoline or the appropriate blendstock at the terminal, as near to the final consumption point as possible. This makes the delivery and distribution of ethanol expensive because it requires more expensive transportation modes, like truck, rail car, barge or ship. Therefore, any significant increase in the production of ethanol will result in more stress on the distribution system. Because ethanol is blended with gasoline at terminals, these facilities must either invest in new ethanol storage tank and blending equipment or dedicate existing storage tanks, thereby reducing the quantity and diversity of on-hand inventory.

Therefore, most ethanol is transported by truck or railcar at costs ranging up to 15 cents per gallon according to estimates of the Energy Policy Research Foundation. These costs compare to gasoline where transportation costs through existing infrastructure is a few cents per gallon. About 80% of ethanol is produced in five mid-western states. As a consequence of high transport costs and transport that is limited in geographic scope, ethanol is not available in all parts of the nation.

When ethanol's role in the gasoline pool exceeds the amount of octane booster and oxygenate needed by fuel blenders, it becomes a direct competitor to gasoline and must be evaluated on the basis of energy content. Ethanol contains one-third less energy per unit of volume (76,000 Btu/gal) than gasoline (115,000 Btu/gal), meaning it requires three gallons of ethanol to displace two gallons of gasoline. As a result, motorists realize lower gas mileage using ethanol blended fuel, and the reduction in imported oil stemming from ethanol displacement of petroleum is less than it might appear.

E-10

EIA projections for 2017 predict gasoline use growing about 13% to 10.5 million barrels per day or the equivalent of 161 billion gallons. This compares to 2006 figures when gasoline consumption equaled 9.3 million barrels per day of 144 billion gallons a year. NPRA urges Congress to act with prudence before mandating E-10 nationwide. Consideration of potential economic, environmental, and logistical constraints should be

fully investigated and understood before embarking on such a far-reaching program. In order to achieve such a goal, every terminal in the nation (over 1500) would be required to install ethanol blending equipment—costs, potential permitting problems, and simple logistics would be a concern. Refiners would be required in many instances to provide a suitable blendstock for the ethanol so as to avoid environmental concerns. Massive increases in rail and local tanker truck deliveries would be required.

E-85

The current automotive fleet is engineered to use gasoline containing up to a maximum 10% ethanol. It is constrained by manufacturer's warranties and regulations prohibiting fuel blends having a higher portion of ethanol. E-85 is an alcohol fuel mixture typically containing up to 85% ethanol and can be used in FFV's. E-85 also has a substantially lower energy content per gallon than gasoline (only about 70% of gasoline's energy content) which results in a substantial fuel economy penalty. In order for the retail consumer to cover the same distance they would using gasoline at same cost, the retail price of E-85 needs to be 25-30% lower than the price of gasoline. Not only does E-85 reduce fuel economy, but its availability at service stations is scarce, and E-85 is not compatible with fuel dispensing equipment at retail gasoline stations.

With only six million FFV's out of a nation pool of 237 million vehicles, very few vehicles on the road today can use gasoline blends containing more than 10% ethanol. This small percentage of vehicles capable of using the fuel, in addition to the energy content differential, limits demand for E-85. It should be noted, however, that NPRA does not oppose the expanded use of E-85 where appropriate. We merely oppose its mandated use and/or imposition of infrastructure development on the refining /marketing industry.

TECHNOLOGIC BREAKTHROUGHS

As previously stated, corn-based ethanol can provide only a fraction of the overall volumes required by the President's and other proposals. And again, it must be

questioned whether corn should play even this big a role in the program. However, NPRA is very concerned that massive programs based on the anticipated development of breakthrough technologies for cellulosic and other bio-fuels will present substantive problems. While NPRA supports government sponsored research and development that augments private enterprise research and development, we believe it prudent to wait until that or any particular technology is proven to be scientifically sound and economically justifiable at commercial scale. Requiring refiners and other obligated parties to commit to huge capital expenditures in the hopes that the technology will be forthcoming must be questioned.

In addition, any policies enacted by Congress to promote the development and use of biofuels should be process and feedstock neutral. The stated goal of reducing the nation's reliance on foreign sources of feedstock supply should not restrict any particular incentive to any one class of technologies, processes, or entities.

LOW CARBON FUELS

California Governor Schwarzenegger issued Executive Order S-01-07 (January 18, 2007) that requires the reduction of "carbon intensity" of transportation fuel sold in California by 10% by 2020. It requires capture of over half of CO₂ to return vehicles to 1990 levels and replace 20% of petroleum use. The standard applies to all refiners, blenders, producers or importers of transportation fuels, and may be met through "market-based methods". In addition, the order requires a full fuel cycle analysis requiring detailed examination of fuel/energy requirements beginning at resource extraction, initial processing, transport, refining, distribution and marketing and ending with vehicle operation and ultimate recycling.

NPRA does not oppose imposition of environmentally sound, economically justifiable regulations. And, as we have previously stated, we believe there is universal agreement that alternative fuels will continue to be a strong and growing component of the nation's transportation fuel mix. We further agree that technologic innovation advances will

continue to provide efficient mechanisms enabling the nation to diversify its transportation fuel and other energy related mixes. However, we must once again urge caution as the nation embarks on these and other programs.

A study by the University of California on the Low Carbon Fuel Standard has resulted in a few telling observations. *"Future improvements in ...methods may show that some technologies currently thought to reduce carbon intensity of fuels are in fact ineffective or even counter productive."* This conclusion should give pause to proceeding headlong into depending on unknown technologies. The study further continues the admonition against moving quickly amidst these uncertainties. California could attain significant fuel supplies of low carbon biofuels, however the UC report further states: *"Attaining the high value would require massive shifting of crops in California."*

Other observations of note in the UC report include:

- *"Even after accounting for uncertainties and unknowns, it appears to be possible to ... [utilize] low-carbon fuel in CA"*
- *"Like all calculations in this study, these values are uncertain but indicate a likely order of magnitude"*
- *".... facilities to produce these fuels do not exist, some... feedstocks are not currently grown commercially, and many ... processes not commercially viable"*
- *"Achieving the 2020 and 2050 goals will not be easy. A central element will be technological innovation..."*

IMPOSITION OF STATE BIOFUEL MANDATES

The present enthusiasm for renewable fuels has resulted in several states and even municipalities adopting local mandates. Local mandates will impose additional strain on the ethanol distribution system and increase costs for shipping and storage. The existing federal Renewable Fuels Standard (RFS) mandate with its credit-trading provisions contains a degree of freedom that allows the distribution system to operate at a low-cost optimum by avoiding infrastructure bottlenecks (such as lack of storage or rail capacity).

Mandating ethanol usage in specific areas forces a distribution pattern that is less flexible, and therefore has less capability to minimize costs. These additional costs will be borne by consumers.

NPRA believes Congress should preempt local and state biofuel mandates and reinforce the efficacy of the federal RFS credit-trading system to ensure that the distribution system has the flexibility needed to minimize costs for the consumer.

NPRA appreciates the opportunity to present our views to the Subcommittee on these vital matters. We wish to work with all stakeholders in the spirit of implementing sound policies that achieve the desired results. I will be pleased to answer any questions that you may have.

Mr. BUTTERFIELD. Dr. Lashof.

**STATEMENT OF DANIEL A. LASHOF, CLIMATE CENTER
SCIENCE DIRECTOR, NATURAL RESOURCES DEFENSE COUN-
CIL, WASHINGTON, DC**

Mr. LASHOF. Thank you very much, I am Daniel Lashof. I am the science director of the Climate Center at the Natural Resources Defense Council. I appreciate the opportunity to share my views with the committee.

As you know, U.S. energy policy must address three major challenges. We have to reduce our dependence on foreign oil, we have to reduce global warming and we have to support a robust economy through our policies. I believe that biofuels has the potential to contribute substantially to all three of those goals, but we have to do it right in order to achieve those goals. Sustainably produced biofuels used in efficient vehicles will reduce global warming pollution and it will reduce our oil dependence and will enhance our rural economies. But there is danger, a severe danger, in our view, to our forests, our public lands, our ecosystems, if we pursue biofuels on a large scale without appropriate guidelines and I want to share some views about the guidelines that I think are needed. And in summarizing my testimony, I would like to make four points and I think have about a minute for each.

First, any expansion of the Renewable Fuel Standard should incorporate explicit environmental performance standards. There is a lot of justifiable excitement about cellulosic ethanol, but it is very important to recognize that the choice of feedstock is just one factor that goes into the overall environmental impact of a particular biofuel production process. If you look at my exhibit in my testimony, or the A chart that is also in my testimony, you can see a variety of greenhouse gas impacts for different fuels. It is possible to use corn as a feedstock and with efficient processing and biomasses to energy source, achieve substantial greenhouse gas benefits from a corn-based system. Conversely, although normally we think of cellulosic ethanol as preferable, if you clear a mature forest in order to get the cellulose that you put into ethanol, you put so much CO₂ in the atmosphere, it would take many, many decades to get that back for the benefits of the fuel. So it is possible to do corn right and it is possible to do cellulosic ethanol wrong. So if you want to have greenhouse benefits for biofuels, you need to explicitly incorporate into the program a requirement to achieve those benefits. That is a way to get that. And a low carbon fuel standard that Mr. Inslee talked about earlier, in our view is the best way to do that.

Second, turning to the administration's proposal, as Mr. Markey brought up earlier, there is a real risk that that proposal could increase rather than decrease global warming emissions. The administration cites it as contributing to reductions in global warming emissions, but nothing in their policy actually guarantees that result and that is because they open the door to alternative fuels that could have much higher greenhouse gas emissions than conventional fuel. They also claim some benefits from improving vehicle fuel economy standards, but again, their proposal there doesn't actually require an increase. It provides for—which they have al-

ready, but doesn't require an increase. In fact, I calculated that if half the alternative fuel mandate proposed by the administration was satisfied with coal-derived liquid fuel, which were produced without CCFs, without carbon capture, the CO² emissions would be 175 million tons higher than the emissions targeted by the administration. And to offset that, if you were to offset that by higher fuel economy standards, you would have to raise fuel economy standards by more than 8 percent per year rather than the 4 percent per year suggested by the administration.

Third, my third point is that electricity for plug-in hybrid vehicles is the best way to use coal as a substitute for gasoline. I believe there is even better alternatives than coal, but if coal is to be used, plug-in hybrid vehicles can displace twice as much gasoline per ton of coal used and produce one-tenth the greenhouse gas emissions per mile as using that same coal to produce liquid fuels. So I believe that we ought to start with where we could use coal, if we are going to use it, to have the natural benefits and that is in the production of electricity at plants that capture carbon dioxide and put it under ground.

Fourth and my final point is that EPA should be directed to protect air quality as it implements any expansion of the Renewable Fuel Standard. As we heard in previous testimony from Mr. Meyers, when you put ethanol in a vehicle, some emissions go up and some go down. There is no reason to allow a trade-off here. EPA should be directed with a very clear, very simple no backsliding rule that when alternative fuels are used in a vehicle, emissions that contribute to air quality degradation should not increase compared with conventional fuel.

So in summary, Mr. Chairman, I do believe that biofuels hold great promise as a tool for reducing global warming pollution, breaking our dangerous addiction to oil and revitalizing rural economies, as long as appropriate standards and incentives are used to shape the Nation's bioenergy industry. Thank you very much.

[The prepared statement of Mr. Lashof follows:]



NATURAL RESOURCES DEFENSE COUNCIL

Statement of

Daniel A. Lashof, Ph.D.

Climate Center Science Director

Natural Resources Defense Council

Before the

Committee on Energy and Commerce

United States House of Representatives

May 8, 2007

Introduction

Thank you for the opportunity to share my views regarding implementation of the Renewable Fuels Standard and possible modifications to achieve greater energy security and environmental benefits. My name is Daniel A. Lashof, and I am the science director of the Climate Center at the Natural Resources Defense Council (NRDC). NRDC is a national, nonprofit organization of scientists, lawyers and environmental specialists dedicated to protecting public health and the environment. Founded in 1970, NRDC has more than 1.2 million members and online activists nationwide, served from offices in New York, Washington, Los Angeles and San Francisco.

Mr. Chairman, as you know, U.S. energy policy must address three major challenges: reducing America's dangerous dependence on oil, reducing global warming pollution, and providing affordable energy services that sustain a robust economy. Biofuels have the potential to contribute significantly to all three of these goals. Sustainably produced biomass feedstocks, processed efficiently and used in efficient vehicles can reduce our dependence on oil for transportation, reduce emissions of heat-trapping carbon dioxide, and contribute significantly to a vibrant farm economy. Pursued without adequate guidelines, however, biofuels production carries grave risk to our lands, forests, water, wildlife, public health and climate. Any policy to expand the use of renewable transportation fuels should incorporate effective performance standards and incentives to ensure that biofuels are part of the solution, rather than part of the problem.

Accelerated corn cultivation for ethanol, for example, threatens to deplete water tables, magnify contamination by fertilizers, pesticides, and herbicides, and undermine vital conservation programs such as the Farm Bill's Conservation Reserve Program. Increased use of ethanol could also impair air quality depending on how it is blended and used. On farms and in forests across the country and abroad, imprudent biomass harvesting would cause soil erosion, water pollution, and habitat destruction, while also substantially reducing the carbon sequestered on land. Advancing a biofuels policy that leads to clearing forests for fuel production, at home or abroad, and hence increased emissions of carbon dioxide would be a particularly perverse result for a policy that is intended, at least in part, to reduce global warming pollution.

The Need for Performance Standards

In structuring an effective transportation fuels policy it is important to recognize that the choice of feedstocks is just one of many factors that influence the environmental impacts of fuel production. For biofuels, key factors to consider in addition to feedstock type are carbon emissions from converting land from other uses to feedstock production, tillage method, energy use for irrigation, fertilizer application rate, the source of thermal energy and electricity at the biorefinery, the overall efficiency of the biorefinery, and whether CO₂ produced during fermentation is sequestered or released into the atmosphere. Considering all of these factors it is possible to produce ethanol derived from corn in a way that produces less than half of the lifecycle greenhouse gas emissions of gasoline (per BTU of delivered fuel). Conversely it is possible to produce ethanol from cellulosic feedstocks in a manner that produces far more CO₂ than gasoline.

First consider a dry mill corn ethanol plant. Greenhouse gas emissions from corn production can be minimized by obtaining the corn from a farm that practices no-till cultivation. In addition, by collecting a portion of the corn stover along with the grain the ethanol plant can meet its thermal energy needs with this biomass energy source rather than fossil fuels. Finally, fermentation produces carbon dioxide in a pure stream that can be easily captured for geologic sequestration. Using Argonne National Laboratory's GREET model, we estimate that the lifecycle greenhouse gas emissions from ethanol produced at such a plant would be 7.5 pounds per gasoline gallon equivalent, or more than 70% lower than gasoline. NRDC has examined the greenhouse gas emissions from a wide variety of feedstock and conversion process combinations using the Argonne GREET model (see Figure 1 and Appendix). EPA conducted a similar analysis for a fact sheet released in conjunction with its final rule for implementing the Renewable Fuels Standard enacted in EPACT 2005.¹ EPA's results are shown in Figure 2 and are very similar to ours (note that EPA displays results relative to conventional gasoline, which is set to zero on their chart.)

¹ <http://www.epa.gov/otaq/renewablefuels/420f07035.htm>

Figure 1. NRDC Lifecycle Greenhouse Gas Analysis

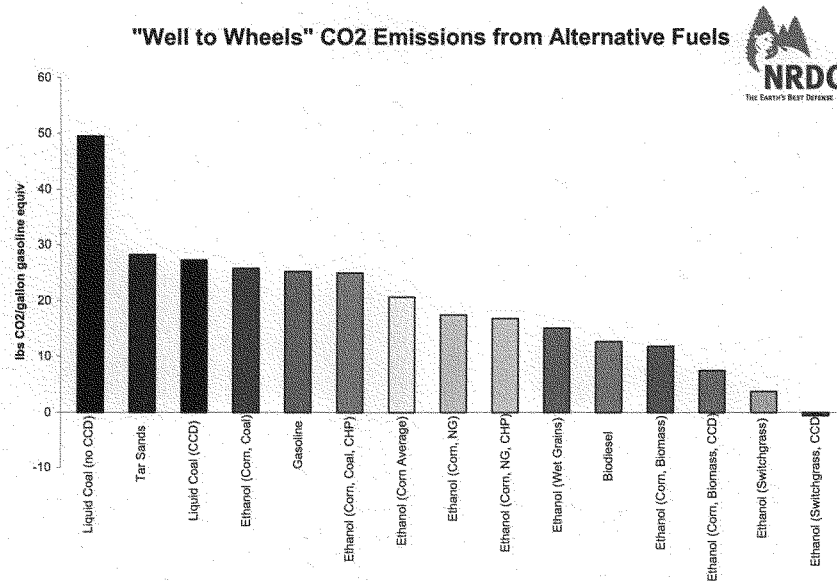
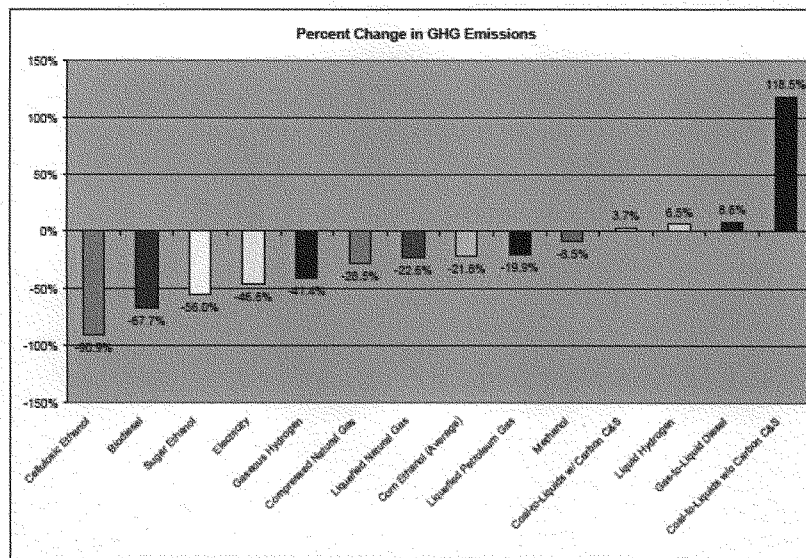


Figure 2. EPA Lifecycle Greenhouse Gas Analysis



Now consider a cellulosic ethanol plant. While such plants are often considered to be environmentally superior to corn ethanol plants, this is not necessarily the case, depending on how the cellulosic feedstock is produced. For example, if the biomass for the cellulosic ethanol plant is obtained by converting to biomass production land that had been enrolled in the conservation reserve program (CRP), then the forgone conservation benefits and carbon benefits must be accounted for. The CRP has enrolled more than 1 million acres in forest cover, including hardwoods, longleaf pine, and other softwoods. While these are secondary, rather than old growth, forests, they nonetheless provide important ecological services and sequester a substantial amount of carbon. Converting such lands to biofuels production would not only rapidly return to the atmosphere the carbon sequestered since the trees were planted, but would also forgo future carbon sequestration on this land. The net result would be CO₂ emissions to the atmosphere many times greater than the annual greenhouse gas benefits from cellulosic ethanol production on this land.

Land conversion need not be this direct to undermine the environmental benefits of biofuel production. Devoting an increased share of U.S. agricultural output to fuel production rather than grain exports will result in increased demand for animal feed from sources abroad. If any significant portion of this additional feed is obtained by converting mature forests into pasture or cropland the CO₂ emissions from this land use change could greatly exceed the emission reductions from the use of biofuels.

Some proposals distinguish between “conventional” biofuels and “advanced” biofuels based just on the type of feedstock from which the fuel is produced. For example, the bill reported by the Senate Energy Committee last week distinguish between “conventional biofuel,” defined as ethanol derived from corn starch, and “advanced biofuels,” which is essentially fuel derived from any other form of renewable biomass. In an important first step the Committee adopted a greenhouse gas performance standard for new biofuels facilities requiring at least a 20 percent reduction in global warming emissions over the fuel lifecycle from feedstock production through processing and use. The bill would also require that an increasing proportion of the overall renewable fuels standard come from advanced biofuels, but does not establish a higher performance standard for such fuels. Structuring the standard to ensure the diversification of feedstocks used for biofuels production is helpful, but is not an adequate substitute for stronger greenhouse gas performance standards and sustainable feedstock sourcing requirements, such as those included in the Advanced Clean Fuels Act of 2007, introduced last week by Senators Boxer, Collins, and Lieberman.

The Administration’s Proposal

The administration has proposed replacing the existing renewable fuels standard with an “alternative fuels” standard that increases to 35 billion gallons by 2017. The administration has asserted that this standard, in combination with their proposed changes to Corporate Average Fuel Economy standards, would return greenhouse gas emissions from light duty vehicles to current levels in 2017, a reduction of about 170 million metric tons below business-as-usual projections. Unfortunately, nothing in the Administration’s

proposal would ensure this result. First, while the administration's analysis assumes that ethanol would be used to comply with the standard, their actual proposal opens the door to a variety of fossil fuels as well as renewable fuels, some of which could have lifecycle greenhouse gas emissions as much as twice as high as petroleum-derived fuel. Second, because of the very aggressive schedule for increasing the use of alternative fuels, the administration's proposal would create enormous pressure to convert forests and conservation reserve program lands to biofuels production, potentially contributing a pulse of carbon dioxide emissions that would take many decades to offset through reduced oil consumption. Third, the schedule is too rapid to allow potentially more beneficial processes for producing biofuels, such as cellulosic ethanol and biobutanol, to satisfy most of the alternative fuel mandate, as indicated by testimony of the president of the leading cellulosic ethanol company. Fourth, while the administration assumed a 4% per year increase in CAFE standards in their projections, the administration's CAFE proposal does not actually guarantee any increase.

These deficiencies in the administration proposal mean that it could lead to an increase, rather than a reduction, in global warming pollution compared with business as usual. For example, if half of the alternative fuels mandate proposed by the administration were satisfied with coal-derived liquid fuels (liquid coal synfuels) then CO₂ emissions would be 175 million tons higher in 2017 than targeted by the administration. To offset this increase through automobile fuel efficiency standards would require an increase of 8.6 percent per year, rather than 4% per year as suggested by the administration.

Liquids from Coal v. Electricity from Coal for Transportation

Even if liquid coal synfuels plants fully employ carbon capture and storage, full fuelcycle greenhouse gas emissions from using these fuels will be somewhat worse than conventional gasoline (see Figures 1 and 2). There is a straightforward reason for this. Liquid coal synfuels are hydrocarbon fuels with about the same carbon content per BTU as conventional gasoline or diesel fuel, so vehicle tailpipe CO₂ emissions from using liquid coal would be nearly identical to those from using conventional fuels. Any CO₂ emissions released from the synfuels production facility have to be added to the tailpipe emissions. The residual emissions from a liquid coal plant employing CCS are still somewhat higher than emissions from a petroleum refinery, hence lifecycle emissions are higher.

While I believe that there are better alternative, if coal is to be used to replace gasoline, generating electricity for use in plug-in hybrid vehicles (PHEVs) can be far more efficient and cleaner than making liquid fuels. In fact, a ton of coal used to generate electricity used in a PHEV will displace more than twice as much oil as using the same coal to make liquid fuels, even using optimistic assumptions about the conversion efficiency of liquid coal plants.² The difference in CO₂ emissions is even more dramatic. Liquid coal produced with CCS and used in a hybrid vehicle would still result in lifecycle greenhouse gas emissions of approximately 330 grams/mile, or **ten times** as much as the

² Assumes production of 84 gallons of liquid fuel per ton of coal, based on the National Coal Council report. Vehicle efficiency is assumed to be 37.1 miles/gallon on liquid fuel and 3.14 miles/kWh on electricity.

33 grams/mile that could be achieved by a PHEV operating on electricity generated in a coal-fired power plant equipped with CCS.³

Biofuels Environmental Performance Principles

The benefits of biofuels can be realized, and the potential pitfalls avoided, through carefully crafted policy. Here I outline key principles that should be incorporated into any expansion of the renewable fuels standard through a combination of robust performance standards, careful definitions of what qualifies as renewable fuel, and incentives to promote voluntary management practices that protect ecological values. These principles were endorsed by twelve leading environmental organizations in a letter sent to Congress on March 27th, which is attached to my testimony for the record.

- *The use of bioenergy must reduce greenhouse gas emissions.*

To assure benefits, new incentives and requirements for increased use of biofuels need to be tied to significant reductions in the greenhouse gas intensity of these fuels. As discussed above, this requires explicit greenhouse gas performance standards rather than an implicit assumption that certain feedstocks will produce greater benefits than others. The most effective approach is to cap total greenhouse gas emissions from transportation fuels and require progressive reductions in the average greenhouse gas emissions per gallon of transportation fuels sold, as California is planning to do. If the renewable fuels standard is expanded, conventional biofuels should be required to achieve at least a 20% reduction in lifecycle greenhouse gas emissions compared to conventional gasoline, as

³ Assumes lifecycle greenhouse gas emission from liquid coal of 27.3 lbs/gallon and lifecycle greenhouse gas emissions from an IGCC power plant with CCS of 106 grams/kWh, based on R. Williams et al., paper presented to GHGT-8 Conference, June 2006.

adopted by the Senate Energy Committee. This level of performance can easily be achieved with efficient corn ethanol plants as shown in Figure 1. Advanced biofuels should achieve at least a 50% reduction in lifecycle greenhouse gas emissions, which can be accomplished through several different feedstock and conversion process combinations.

- *Biomass used for bioenergy has to be renewable.*

Biomass must be regrown on site, recapturing its released carbon, so that it is genuinely sustainable – unless it is the by-product of activity with independent, over-riding social utility (such as removal of vegetation immediately around wildland-interface homes). Greenhouse gas emissions from land-use change associated with biofuels production, both directly and indirectly, must be accounted for to ensure that biofuels are genuinely renewable and produce net environmental benefits. If wastes are used, care must be taken to prevent combustion of any toxic materials, such as pressure treated or painted wood products. In addition, material such as post-consumer waste paper should be recycled rather than converted to fuel in order to reduce the pressure on forests for virgin fibers.

- *Bioenergy feedstocks must not be grown on environmentally sensitive lands.*

Some areas should simply be off limits for biofuels production. Biofuels should not qualify toward compliance with any renewable fuels standard if the biomass is obtained from old growth forests, wilderness study areas, roadless areas of national forests, native grasslands, important wildlife habitat, or ecosystems that are intact, rare, high in species richness or endemism, or exhibit rare ecological phenomena.

- *Conversion of natural ecosystems must be avoided.*

Habitat loss from the conversion of natural ecosystems represents the primary driving force in the loss of biological diversity worldwide. Activities to be avoided include those that alter the native habitat to such an extent that it no longer supports most characteristic native species and ecological processes.

- *Exemptions and waivers from environmental rules must not be used to promote biomass production or utilization.*

Trading one serious environmental harm for another is poor policy. Our environmental laws and regulations act as a fundamental system of checks and balances to guard against just such collateral damage and the promotion of bioenergy production and utilization must in no way be exempted.

- *Conservation and Wetland Reserve Programs supported by the Farm Bill must be managed for their conservation benefits.*

These programs protect marginal lands, water quality, soil, and wildlife habitat. Enrolled lands need to be managed principally for these important values, not bioenergy feedstocks.

- *Independent certification, market incentives, and minimum performance requirements are necessary to ensure that bioenergy feedstocks are produced using sustainable practices.*

Certification standards for biomass from private lands should address key environmental and social objectives, such as protection of wildlife habitat, prevention of erosion, conservation of soil and water resources, nutrient management, selection of appropriate feedstock species, and biologically-integrated pest management. New policies are needed to ensure that producers, refiners and distributors adhere to minimum performance requirements and have incentives to maximize environmental performance at each step.

- *Stringent safeguards must be established for bioenergy production from feedstock derived from federal land.*

Federal lands, including wildlife refuges, national forests, and national grasslands, are held subject to the public's interest in their non-commodity values. They are not appropriate for large-scale, sustained biomass sourcing.

Implementation of the Renewable Fuels Standard

EPA recently issued its final rules to implement the renewable fuels standard (RFS) enacted as part of the 2005 Energy Policy Act. Congress appropriately assigned this responsibility to EPA as it has the authority to regulate transportation fuels under the Clean Air Act as well as experience with implementing credit trading programs. Any expansion of the RFS should similarly be implemented by EPA and should build on the system of Renewable Identification Numbers (RINs) established by EPA to implement the existing program.

EPA has also already explored how the RIN system could be expanded to track environmental practices in biofuel feedstock production as well as lifecycle greenhouse emissions. While some may argue that there is insufficient information available to implement a program based on lifecycle greenhouse gas emissions this is not the case. Statewide data on average yields, and energy and fertilizer use for different crops can be combined with specific information for individual biorefineries to arrive at reasonable estimates of lifecycle greenhouse gas emissions for each batch of biofuels. Indeed, although the administration ultimately rejected it, EPA proposed to label renewable fuels based on their lifecycle greenhouse gas emissions as well as the sustainability of feedstock production methods under the RFS. Hence EPA has already done most of the policy and methodological development needed to implement an expanded RFS that includes greenhouse gas performance standards and incentives for management practices that protect ecological values.

It is important to recognize that an effort to dramatically increase the use of biofuels must not ignore the potential adverse impacts such use may have on air quality. It is widely recognized that when ethanol, whether derived from corn or cellulosic biomass, is mixed with gasoline and burned in today's vehicles, some emissions go up and some go down. Further, it is understood that the magnitude of these emissions is significantly affected by both the parameters of the fuel in which the ethanol is used and the air pollution control and other equipment on the vehicles that burn the fuel. NRDC has focused most on the emissions that contribute to smog, but we must not ignore the potential for increases in particle pollution and toxic air pollutants. I would like to emphasize that the latest

scientific research indicates that our current National Ambient Air Quality Standard for ozone (smog) does not provide an adequate level of safety. Therefore, it is critically important that we continue to reduce the emissions that contribute to smog even as we promote ways to transition our nation's transportation system to low-carbon biofuels.

EPA's Regulatory Impact Analysis that accompanied its recent renewable fuels standard (RFS) rulemaking found that, particularly in the areas that do not use gasoline with special limits to volatility, the use of the mandated levels in the current RFS will increase smog emissions 4-6 % (Table 4.1-12) with the possibility that NOx emissions might increase as much as 10% (Table 4.1-13). Clearly the prospect of adopting an RFS that more than quadruples the amount of ethanol mandated to be used in the nation's fuel supply demands an examination of such fuel use on smog impacts. Any such legislation should require serious analysis of the potential impact of a large ethanol increase on emissions, and a requirement that new volumes of ethanol be introduced in transportation fuel in ways that, at a minimum, do not increase the current levels of smog-forming pollutants in the nation's vehicle fleet. Further, the introduction of such fuels should also not increase toxic air pollutants or particle pollution.

To accomplish these sensible – and we believe uncontroversial – objectives, NRDC urges Congress to direct EPA to adopt regulations requiring that the emissions of any air pollutant from vehicles using renewable fuel shall be no greater than the level of such emissions from vehicles when using conventional gasoline. This is a straightforward no-backsliding requirement that will ensure that ethanol actually lives up to the name of

being a cleaner fuel, delivering very real global warming benefits while not worsening air quality.

Moreover, Congressional action should address EPA's recent objectionable Clean Air Act rulemaking allowing new and upgraded ethanol plants to increase harmful emissions of smog and soot pollution by evading the need for air pollution controls that have always been required at these plants. Recently amended EPA rules now allow new biorefineries to more than double their emissions of harmful air pollution before they are required to install pollution controls, with the agency having increased the regulatory control threshold from 100 tons per year to 250 tons per year. Moreover, this rule will also allow existing ethanol plants to be even dirtier than allowed under pre-existing law, increasing smog and soot pollution and evading controls that the law has always required. The harm caused by this EPA rulemaking will be worsened by the recent disturbing trend of biorefineries resorting to coal to fuel ethanol production. Indeed, many observers believe that EPA's recent rulemaking was adopted precisely for the purpose of allowing these coal-burning biorefineries to be built and to avoid pollution control equipment that clean air rules required prior to EPA's rollback. EPA admits, as it must, that its recent rulemaking will create more air pollution from these facilities.

Congress should reject this indefensible EPA action that makes ethanol production dirtier at precisely the moment that there is a proliferation of these plants around the country. Moving forward with a new RFS to more than quadruple the amount of ethanol mandated

in the nation's fuel supply *without* reversing EPA's harmful rulemaking will only ensure more air pollution, more hazy skies, and more health problems for the American people,

An expanded RFS should also be updated to accommodate renewable electricity used for transportation in emerging vehicles, such as Plug-in Hybrid Electric Vehicles (PHEVs). This can be accomplished by allowing electricity providers to opt into the program as fuel providers as long as they use smart meters to track separately renewable electricity supplied for transportation purposes. With the emergence of PHEVs and other electric vehicles, renewable electricity can be an important additional option to augment renewable biofuels to supply non-petroleum, low greenhouse gas fuels for transportation.

Conclusion

Renewable fuels hold great promise as a tool for reducing global warming pollution, breaking our dangerous oil addiction, and revitalizing rural economies, as long as appropriate standards and incentives are used to shape the nascent bioenergy industry to provide these benefits in a sound and truly sustainable fashion. I look forward to working with the Committee to accomplish this important goal.

Appendix. Basis for Figure 1.

Figure 1 compares the well-to-wheels (or full fuel cycle) emissions from alternative transportation fuels in pounds of CO₂-equivalent per gallon of gasoline energy content equivalent. The basis for each bar is described briefly below:

Liquid Coal (no CCD): Fischer-Tropsch fuel produced from coal without carbon dioxide capture and disposal (CCD). Based on a stand-alone plant (R. Williams, Princeton University).

Tar Sands: Gasoline made from synthetic petroleum produced from Canadian tar sands. (Based on Oil Sands Fever, Pembina Institute, November 2005)

Ethanol (Corn, Coal): Ethanol produced from corn using coal for process energy at the ethanol plant. (Based GREET 1.7 beta as modified by Turner et al.)

Liquid Coal (CCD): Fischer-Tropsch fuel produced from coal with carbon dioxide capture and disposal (CCD) from the production plant and assuming a stand-alone plant. (R. Williams, Princeton University).

Gasoline: Conventional gasoline, including upstream emissions. (Based on GREET 1.7 beta)

Ethanol (Corn, Coal, CHP): Ethanol produced from corn using coal for process energy in a combined heat and power system at a new dry mill ethanol plant. (Based GREET 1.7 beta as modified by Turner et al.)

Ethanol (Corn Average): Estimate of the national average emissions rate from the current mix of fuel used for ethanol production and the current mix of dry and wet mills. (Based on GREET 1.7 beta as presented in Wang et al., "Life-Cycle Energy and Greenhouse Gas Emissions Impacts of Different Corn Ethanol Plant Types," presentation to 16th International Symposium on Alcohol Fuels, November 2006.)

Ethanol (Corn, NG): Ethanol produced from corn using natural gas for process energy at a dry mill ethanol plant. (Based GREET 1.7 beta as modified by Turner et al.)

Ethanol (Corn, NG, CHP): Ethanol produced from corn using natural gas for process energy in a combined heat and power system at a new dry mill ethanol plant. (Based on GREET 1.7 beta as presented in Wang et al., "Life-Cycle Energy and Greenhouse Gas Emissions Impacts of Different Corn Ethanol Plant Types," presentation to 16th International Symposium on Alcohol Fuels, November 2006.)

Ethanol (Wet Grains): Same as "Corn, NG," except that plant sells wet distiller grains as a coproduct, saving the energy of drying the grains. (Based GREET 1.7 beta as modified by Turner et al.)

Biodiesel: Biodiesel derived from soy oil through fatty-acid methol-esterfication estimate including upstream emissions. (Based on GREET 1.7 beta)

Ethanol (Corn, Biomass): Same as Corn No Till, except that biomass is used for process energy. (Based GREET 1.7 beta as modified by Turner et al.)

Ethanol (Corn, Biomass, CCD): Ethanol produced from corn using biomass for process energy at a dry mill ethanol plant with capture and disposal of the CO₂ produced from the fermentation process. Corn is grown with no-till practices and plant sells wet grains. (Based GREET 1.7 beta as modified by Turner et al. subtracting fermentation CO₂ of 6.6 pounds of CO₂ per gallon of ethanol per <http://www.kgs.ku.edu/PRS/Poster/2002/2002-6/P2-05.html>.)

Ethanol (Switchgrass): Ethanol produced from the cellulose in switchgrass using the lignin for process energy. (Based GREET 1.7 beta as modified by Turner et al.)

Ethanol (Switchgrass, CCD): Ethanol produced from the cellulose in switchgrass using the lignin for process energy with capture and disposal of the CO₂ produced from the fermentation process. (Based GREET 1.7 beta as modified by Turner et al. subtracting fermentation CO₂ of 6.6 pounds of CO₂ per gallon of ethanol per <http://www.kgs.ku.edu/PRS/Poster/2002/2002-6/P2-05.html>.)

Sources:

The Greenhouse Gases, Regulated Emissions, and Energy Use in Transportation (GREET) Model, GREET 1, Version 1.7, developed by the UChicago Argonne, LLC as Operator of Argonne National Laboratory under Contract No. DE-AC02-06CH11357 with the Department of Energy (DOE).

Turner et al., "Creating Markets for Green Biofuels, Measuring and Improving Environmental Performance," UC Berkeley Transportation Sustainability Research Center, publication pending.

Mr. BUTTERFIELD. All right, Mr. Dinneen.

**STATEMENT OF BOB DINNEEN, PRESIDENT, RENEWABLE
FUELS ASSOCIATION, WASHINGTON, DC**

Mr. DINNEEN. Thank you, Mr. Chairman. Please, you will have to excuse me. I am having a serious *deja vu* experience here today, because I can remember not too long ago when I was testifying before this very committee with some of the same organizations testifying along side me that were very concerned about the 3 billion gallon Renewable Fuel Standard that this committee was at that time considering, and they were testifying with great passion about how much that was going to disrupt the marketplace and how the ethanol industry certainly couldn't produce that much ethanol and even if they could they wouldn't be able to distribute it across the country and what a disaster it was going to be for our Nation's gasoline infrastructure.

Well, Mr. Chairman and members of the committee, we are now a few years later. This committee wisely put in place the Renewable Fuel Standard that imposed a 7½ billion gallon RFS by 2012, and as the testimony you have already heard today suggests, we have not only met it, we have exceeded it. Given the market signal that the Renewable Fuel Standard is providing, our industry began a rapid expansion. Wall Street recognized that this was a place to put their investment dollars. The refining community recognized that ethanol was a part of their future and I frankly give them great credit for working with our industry to build the infrastructure, to make the transition to an RFS such a success as it has been. But look at what you have today. We now have 116 ethanol plants in operation all across the country. Ethanol is blended in 46 percent of our Nation's fuel. But we are not done yet. There are no less than 81 ethanol plants that are under construction all across the country, in areas far outside of the typical Midwest grain belt. We have got plants under construction today in California, in Arizona, Mr. Shadegg, in Florida, in Georgia. There are actually more plants under construction today in Texas than in Illinois. The industry is growing and growing rapidly and it is providing tremendous benefits and it is revitalizing rural communities all across this country. That is what this Congress foresaw; that is the reality that the RFS has been.

The industry is evolving, it is changing as it grows. As new capital comes into the industry, new intellectual capital is coming into the industry as well, looking at new ideas and new feedstocks and new technologies. There is not an ethanol company that I represent that does not have a cellulose-to-ethanol research program underway today. Why? Because they already have cellulose coming into the facility and they recognize that that is going to be a significant part of the future, not as a replacement to grain, but certainly as an additional component of what we are able to get from our abundant agricultural and waste products across this country.

Recently the Department of Energy, under grant program that the Energy Policy Act of 2005 provided, gave six different grants to six different companies in six different parts of the country, using six different technologies on cellulose. It ranges from processing ethanol from municipal solid waste with acid hydrolysis to

processing ethanol from woody biomass using gasification to processing ethanol from corn stover and other waste off the corn field using intermatic conversion. Cellulosic ethanol production is far closer to a reality than conventional wisdom believes and it is going to happen soon. And that is a good thing, because our industry is going to continue to grow and we need to be able to look to other resources beyond just grain.

As the industry grows, as our production base expands, the marketplace is also evolving. You now see ethanol largely being sold as a blend component in gasoline, but thanks to the leadership of U.S. automakers like General Motors and Ford, that have made a very real commitment to flexible fuel technology that will allow ethanol to be used as E-85 all across the country, we see an opportunity to grow beyond a blend market and to grow into those E-85 markets. The oil industry has certainly wrapped themselves around ethanol as a blend component in gasoline and I give them great credit for that. They continue to resist ethanol as a replacement fuel in E-85 and I guess if they did anything else, I would be somewhat confused. But that is the reality. That is where we need to be moving if we are indeed going to address our energy and environmental issues with the intensity and the focus that I believe this country and this Congress wants us to do. The oil industry will continue to oppose that, but that is a dog fight farmer story. I am intent on working with this committee to make sure that we move beyond that and we get to a future that is far more sustainable. Thank you, Mr. Chairman.

[The prepared statement of Mr. Dinneen follows:]



Renewable Fuels Association

**Energy & Commerce Committee
Subcommittee on Energy and Air Quality
United States House of Representatives**

**Hearing on
Alternative Fuels: Current Status, Proposals for New Standards, and Related
Infrastructure Issues**

Testimony of

**Bob Dinneen
President & CEO, Renewable Fuels Association**

May 8, 2007

Good morning, Chairman Boucher 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.

This is an important and timely hearing, and I am pleased to be here to discuss the effect the Renewable Fuels Standard (RFS) has had on the market for renewable fuels in the U.S., some of the recent proposals to revise the RFS and expand the program to include other types of fuels, and policies that Congress could enact that would more quickly deploy the infrastructure necessary to increase alternative fuel availability.

Background

Today's ethanol industry consists of 116 biorefineries located in 19 different states with the capacity to process almost 2 billion bushels of grain into 6 billion gallons of high octane, clean burning motor fuel, and more than 12 million metric tons of livestock and poultry feed. It is a dynamic and growing industry that is revitalizing rural America, reducing emissions in our nation's cities, and lowering our dependence on imported petroleum.

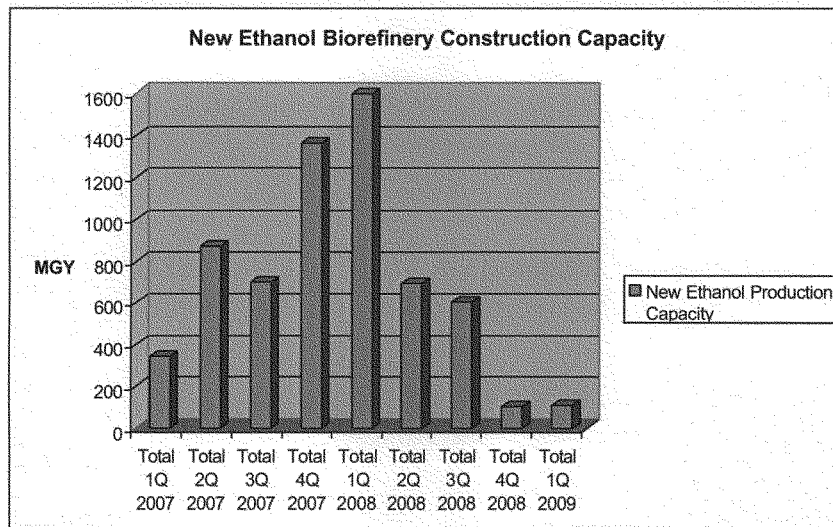
Ethanol has become an essential component of the U.S. motor fuel market. Today, ethanol is blended in almost 50 percent of the nation's fuel, and is sold virtually from coast to coast and border to border. The almost 5 billion gallons of ethanol produced and sold in the U.S. last year contributed significantly to the nation's economic, environmental and energy security.

According to an analysis completed for the RFA¹, the approximately 5 billion gallons of ethanol produced in 2006 resulted in the following impacts:

- Added \$41.1 billion to gross output;
- Created 160,231 jobs in all sectors of the economy;
- Increased economic activity and new jobs from ethanol increased household income by \$6.7 billion, money that flows directly into consumers' pockets;
- Contributed \$2.7 billion of tax revenue for the Federal government and \$2.3 billion for State and Local governments; and,
- Reduced oil imports by 170 million barrels of oil, valued at \$11.2 billion.

In addition to providing a growing and reliable domestic market for American farmers, the ethanol industry also provides the opportunity for farmers to enjoy some of the value added to their commodity by further processing. Farmer-owned ethanol plants account for 43 percent of the U.S. fuel ethanol plants and almost 34 percent of industry capacity.

There are currently 81 biorefineries under construction. With eight existing biorefineries expanding, the industry expects more than 6.3 billion gallons of new production capacity to be in operation by the end of 2009. The following is our best estimate of when this new production will come online.



¹ *Contribution of the Ethanol Industry to the Economy of the United States*, Dr. John Urbanchuk, Director, LECG, LLC, December, 2006.

Status of the Renewable Fuels Standard

Due to the visionary and invaluable work of this Committee in the 109th Congress, the Energy Policy Act of 2005 (EPAct 2005) put our nation on a new path toward greater energy diversity and national security through the RFS. EPAct 2005 has stimulated unprecedented investment in the U.S. ethanol industry. Since January of 2006, when the RFS went into effect, no fewer than 15 new ethanol biorefineries have begun operation, representing some 1.2 billion gallons of new production capacity. These new gallons represent a direct investment of more than \$1.8 billion and the creation of more than 22,000 new jobs in small communities across rural America.

The RFS has done exactly what Congress intended. It provided our industry with the opportunity to grow with confidence. It convinced the petroleum industry that ethanol would be a significant part of future motor fuel markets and moved them toward incorporating renewable fuels into their future plans. It persuaded the financial community that biofuels companies are growth market opportunities, encouraging significant new investment from Wall Street and other institutional investors. If a farmer in Des Moines doesn't want to invest in the local co-op, he can choose to invest in a publicly traded ethanol company through the stock market, as can a schoolteacher in Boston, or a receptionist in Seattle. Americans from coast-to-coast now have the opportunity to invest in our domestic energy industry, and not just in biofuels like ethanol and biodiesel, but bio-based products as well.

In addition to the RFS, many of the other programs authorized by EPAct 2005, such as the loan guarantee and grant programs, will accelerate the commercialization of cellulosic ethanol. The House Energy and Commerce Subcommittee on Energy and Air Quality will have an invaluable role to play in making sure our nation successfully moves toward increasing the use of domestic, renewable energy sources.

U.S. Environmental Protection Agency (EPA) Administrator Stephen Johnson signed into law the final implementation rules of the historic RFS into law on April 10, 2007. EPA has worked diligently with all stakeholders, including the RFA, to create a program that provides oil refiners the flexibility they need while still honoring Congressional intent to expand the use of renewable fuels. The success of this program is paramount to the future of America and the U.S. renewable fuels industry. The RFS program has created the fastest growing energy sector anywhere in the world. The RFA commends the commitment and dedication of Administrator Johnson and the EPA staff for getting this program fully implemented in a timely and efficiently process.

Building off of the success of the RFS, some have suggested expanding the current program to include other alternative fuels. The Administration has proposed replacing the RFS with an Alternative Fuels Standard (AFS) that would replace as much as 35 billion gallons of petroleum by 2017. We applaud the President's vision and certainly support the intent to increase the production and use of a wide range of alternative fuels. Diversification of our energy resources will only positively contribute to our nation's energy and economic security. But while the RFS has provided a great deal of certainty to the marketplace and the investment community, we are concerned that an AFS would only add confusion to the marketplace. Setting aside the success of the RFS and creating a new program that would attempt to crowd a number of alternative fuels into one program would reduce the confidence that EPAct 2005 gave to the renewable fuels

industry, and provide no clear market drivers for continued investment in the still developing renewable and alternative fuels industries. Going forward, RFA envisions a diversity of programs for each of several groupings of renewable and alternative fuels that will send the appropriate signals to the marketplace to determine which fuels are cost effective and environmentally responsible.

Deployment and Commercialization of New Technologies and Feedstocks

To date, the U.S. ethanol industry has grown almost exclusively from grain processing. As a result of steadily increasing yields and improving technology, the National Corn Growers Association (NCGA) projects that by 2015, corn growers will produce 15 billion bushels of grain. According to the NCGA analysis, this will allow a portion of that crop to be processed into 15 billion gallons of ethanol without significantly disrupting other markets for corn.

In the future, however, ethanol will be produced from other feedstocks, such as cellulose. Ethanol from cellulose will dramatically expand the types and amount of available material for ethanol production, and ultimately dramatically expand ethanol supplies. Many companies are working to commercialize cellulosic ethanol production. Indeed, there is not an ethanol biorefinery in production today that does not have a very aggressive cellulose ethanol research program. The RFA believes cellulose ethanol will be commercialized first by current producers who have these cellulosic feedstocks at their grain-based facilities.

Further, biotechnology will play a significant role in meeting our nation's future ethanol needs. Average yield per acre is not static and will increase incrementally, especially with the introduction of new biotech hybrid varieties. According to NCGA, corn yields have consistently increased an average of about 3.5 bushels per year over the last decade. Based on the 10-year historical trend, corn yield per acre could reach 180 bushels by 2015. For comparison, the average yield in 1970 was about 72 bushels per acre. Agricultural companies like Monsanto believe we can achieve corn yields of up to 300 bushels per acre by 2030. It is not necessary to limit the potential of any feedstock – existing or prospective. Ultimately, the marketplace will determine which feedstocks are the most economically and environmentally feasible.

The ethanol industry today is on the cutting edge of technology, pursuing new processes, new energy sources and new feedstocks that will make tomorrow's ethanol industry unrecognizable from today's. Ethanol companies are already utilizing cold starch fermentation, corn fractionation, and corn oil extraction. Companies are pursuing more sustainable energy sources, including biomass gasification and methane digesters. And, as stated, there is not an ethanol company represented by the RFA that does not have a cellulose-to-ethanol research program. These cutting edge technologies are reducing energy consumption and production costs, increasing biorefinery efficiency, improving the protein content of feed co-products, utilizing new feedstocks such as cellulose, and reducing emissions by employing best available control technologies.

While there are indeed limits to what we will be able to produce from grain, cellulose ethanol production will augment, not replace, grain-based ethanol. The conversion of feedstocks like corn stover, corn fiber and corn cobs will be the "bridge technology" that leads the industry to

the conversion of other cellulosic feedstocks and energy crops such as wheat straw, switchgrass, and fast-growing trees. Even the garbage, or municipal solid waste, Americans throw away today will be a future source of ethanol.

The technology exists to process ethanol from cellulose feedstocks; however, commercialization of cellulosic ethanol remains a question of economics and markets. The capital investment necessary to build cellulosic ethanol facilities remain about five times that of grain-based facilities. Those costs will, of course, come down once the first handful of cellulosic facilities are built, the bugs in those “first mover” facilities are worked out, and the technology continues to advance. The enzymes involved in the cellulosic ethanol process remain a significant cost, as well. While there has been a tremendous amount of progress over the past few years to bring the cost of those enzymes down, it is still a significant cost relative to processing grain-based ethanol.

To persist in this technological revolution, however, continued government support will be critically important to build upon the industry’s advancements in technologies to reduce energy consumption, improve biorefinery efficiency, and develop new co-products will be fundamental. Programs authorized by EPCA, such as the loan guarantee and grant programs, to accelerate the commercialization of cellulosic ethanol must be fully funded. Programs that build upon the existing programs authorized in EPCA 2005 will allow technologically promising cellulosic ethanol projects move the industry forward become a reality.

It is also important to recognize, however, that the financial community will have to recognize real market opportunities for cellulosic ethanol to be viable. There are certainly adequate supplies of grain-based ethanol to meet the demand for ethanol as a blend component in gasoline. But if Congress intends to grow the market for biofuels beyond a gasoline additive, other more aggressive programs will be necessary.

Infrastructure

Ethanol today is largely a blend component with gasoline, adding octane, displacing toxics and helping refiners meet Clean Air Act specifications. But the time when ethanol will saturate the blend market is on the horizon, and the industry is looking forward to new market opportunities. As rapidly as ethanol production is expanding, it is possible the industry will saturate the existing blend market before a meaningful E-85 market develops. In such a case, it would be most beneficial to allow refiners to blend ethanol in greater volumes, e.g., 15 or 20 percent. The ethanol industry today is engaged in testing on higher blend levels of ethanol, beyond E-10. There is evidence to suggest that today’s vehicle fleet could use higher blends. An initial round of testing is underway, and more test programs will be needed. Additional study of increased blend levels of ethanol will be an essential and necessary step to moving to higher blend levels with our current vehicle fleet. Higher blend levels would have a significant positive impact on the U.S. ethanol market, without needing to install new fuel pumps and wait for a vehicle fleet to turn over in the next few decades. It would also allow for a smoother transition to E-85 by growing the infrastructure more steadily.

Enhancing incentives to gasoline marketers to install E-85 refueling pumps will continue to be essential. By expanding tax incentives for E-85 refueling infrastructure, and creating new consumer-based tax incentives to encourage flexible fuel vehicles production new markets for renewable fuels will open. There are now more than 1,000 E-85 refueling stations across the country, more than doubling in number since the passage of EPAct 2005. The RFA also supports the concept of regional “corridors” that concentrate the E-85 markets first where the infrastructure already exists.

Over the past several years, the ethanol industry has worked to expand a “Virtual Pipeline” through aggressive use of the rail system, barge and truck traffic. As a result, we can move product quickly to those areas where it is needed. Many ethanol plants have the capability to load unit trains of ethanol for shipment to ethanol terminals in key markets. Unit trains are quickly becoming the norm, not the exception, which was not the case just a few years ago. Railroad companies are working with our industry to develop infrastructure to meet future demand for ethanol. We are also working closely with terminal operators and refiners to identify ethanol storage facilities and install blending equipment. We will continue to grow the necessary infrastructure to make sure that in any market we need to ship ethanol there is rail access at gasoline terminals, and that those terminals are able to take unit trains. Looking to the future, a study of the feasibility of transporting ethanol by dedicated pipeline from the Midwest to the East and West coasts will be critical.

As flexible fuel vehicle (FFV) production is ramped up, it is important to encourage the use of the most efficient technologies. Some FFVs today experience a reduction in mileage when ethanol is used because of the differences in BTU content compared to gasoline. But the debit can be easily addressed through continued research and development. For example, General Motors has introduced a turbo-charged SAAB that experiences no reduction in fuel efficiency when E-85 is used. There is also technology being developed that utilizes “variable compression ratio engines” that would adjust the compression ratio depending on the fuel used. Thus, if the car’s computer system recognized E-85 was being used, it would adjust the compression ratio to take full advantage of ethanol’s properties. The study of new technologies could dramatically improve E-85 economics by eliminating or substantially reducing the mileage penalty associated with existing FFV technology.

Conclusion

The 109th Congress enacted several policies, EPAct 2005 most importantly, that clearly put our nation on a new path toward greater energy diversity and national security. Additional and more focused research and development programs, and increased funding levels for EPAct 2005 programs, will be critical to the rapid deployment and commercialization of new technologies for biofuels. Infrastructure will need to continue to expand and advance as the biofuels market does. The continued commitment of the 110th Congress and this Committee to further expand the rapidly growing domestic biofuels industry that will soon eclipse the current RFS will all contribute to ensuring America’s future energy security.

Thank you.

Mr. BUTTERFIELD. Thank you very much. Well, all the time has expired for the testimonies. We are going to start the questioning. The problem is we have three votes on the House floor at this moment. It looks about 10 minutes and 15 seconds remaining for us to get to the House floor. That means that we will reconvene in about 30 to 45 minutes. That would be 10 minutes after the last vote. At this time, the committee is in recess.

[Recess]

Mr. BUTTERFIELD. I thank all of you for your patience. We are now ready to resume the committee hearing. At this time it is my pleasure to recognize the distinguished chairman of the committee, the gentleman from Michigan, for questions.

Mr. DINGELL. Mr. Chairman, I thank you for your courtesy.

Gentlemen of the panel, these questions will be asked so that you can answer yes or no because of the great limitation on time. First question, Ms. Lowery, if you please, approximately how many vehicles are already on the road today capable of operating on alternative fuels such as E-85?

Ms. LOWERY. It is more than 6 million on the road today, 2 million from General Motors.

Mr. DINGELL. Now in June, Ms. Lowery, General Motors announced and Ford announced and the Chrysler group announced that they would double their production of vehicles capable of operating on renewable fuels by 2010 and have committed to making half of all vehicles production biofuel-capable by 2012, is that correct?

Ms. LOWERY. Yes, it is.

Mr. DINGELL. Now, Mr. Greco, if you please, is it not true that E-85 accounted for only 1 percent of the alternative fuel consumption in the United States in 2004?

Mr. GRECO. I don't know the number.

Mr. DINGELL. You don't know the number?

Mr. GRECO. No.

Mr. DINGELL. Would I be incorrect if I said 1 percent?

Mr. GRECO. Or less, maybe. I don't know.

Mr. DINGELL. OK. Now, the Congressional Research Service so advised us and the committee. Mr. Greco, another question. Is it not true that out of 165,000 retail outlets selling motor fuels to consumers, there are only approximately 1,000 which offer E-85 to consumers?

Mr. GRECO. DOE mentioned 1,200 this morning, I guess about a 70 percent increase.

Mr. DINGELL. All right.

Mr. GRECO. About 1,200 this morning that DOE mentioned, yes.

Mr. DINGELL. OK.

Mr. GRECO. About 1,200.

Mr. DINGELL. Twelve hundred. I will deal with the correction. And out of these 1,000 or 1,200 stations, approximately 100 of these stations are branded by a company generally recognized as one of your members, so I would suspect that out of this number, only 10 percent of those affiliated with your member companies are included in the numbers, is that a correct statement?

Mr. GRECO. I don't know. I am not sure which brands are involved or what the market arrangements are for those companies.

Mr. DINGELL. Now, I will insert in the record a list of stations available in the United States and I ask unanimous consent, Mr. Chairman, that that be done.

Mr. Greco, have your association or your member companies made a commitment comparable to that of Ford, GM or Chrysler, to facilitate the installation of E-85 pumps?

Mr. GRECO. We have made a commitment to use ethanol in gasoline to a maximum extent, as by law and that is what we are focused on.

Mr. DINGELL. So you are telling me you have not made a commitment of that kind?

Mr. GRECO. Our focus is on using E-10 in every gallon of gasoline that can be used by every vehicle on the road today. That is the focus of the membership.

Mr. DINGELL. I guess you are telling me your answer then, sir, is no. Now, Mr. Drevna, if you please, has your association or your member companies made a comparable commitment to facilitate the installation of E-85 pumps?

Mr. DREVNA. No, sir, we haven't made any commitment like that, but I will stand by the same response of Mr. Greco. We look at the market and what the market demands these days and—

Mr. DINGELL. So the answer is?

Mr. DREVNA. The answer would be no, sir.

Mr. DINGELL. The answer is no. Now, Mr. Greco and Mr. Drevna, in the interest of solving the problem here which we have of the chicken and the egg, for once and all, if the Congress mandated that automakers produce flex-fuel vehicles, would you or your organizations support a corresponding mandate, accompanied by corporate financial support for small, independent retail outlets, to install E-85 pumps so that consumers can buy and use this alternative to petroleum? Would you please, first, Mr. Greco.

Mr. GRECO. No, our members are focused on E-10 and when the consumer wants E-85, the demand will drive the availability of that.

Mr. DINGELL. So the answer is you would not make that commitment.

Mr. GRECO. No.

Mr. DINGELL. Mr. Drevna, what do you have to say about this matter?

Mr. DREVNA. Basically the same, Mr. Chairman.

Mr. DINGELL. Thank you. So you are telling us that your organization would not make that commitment, either. Gentlemen, thank you, and Mr. Chairman, for your courtesy, thank you.

Mr. BUTTERFIELD. All right, thank you, Mr. Chairman. At this time, the gentleman from Oklahoma is recognized for 5 minutes.

Mr. SULLIVAN. Thank you, Mr. Chairman. Mr. Dinneen, my understanding is that the current Federal tax incentives for ethanol fuels is provided to the producer of the gasoline, which includes some big oil companies. Can you explain how, if the tax incentive is provided to the producer of the gasoline, this incentive program has helped corn farmers and ethanol producers?

Mr. DINNEEN. We find that the gasoline marketers of blended ethanol are indeed given a tax incentive to allow them to pay more for the ethanol that they are buying. Now, how much of the tax in-

centives filters down to the producer is a discussion that the ethanol producer would have with their refiner or gasoline marketer or customer.

Mr. SULLIVAN. OK. And Mr. Drevna, you suggest in your statement that substantially expanded the renewable fuels mandate could suppress refining expansion. Could you elaborate on that statement? Could the U.S. end up becoming a net exporter of gasoline if all of these proposals were to take effect?

Mr. DREVNA. I am glad you asked that question, Mr. Sullivan, because, first of all, any mandate, an increase of a mandate over today's EPA 2005 volumes, it wouldn't actually give pause to refinery executives as to whether they should continue with capacity expansions. If we could talk for a moment, sir, about what the world would look like in 2017. And again, there has been a lot of ifs here. If cellulosic comes into play, if all of these other technologies come into play and we are required, as an industry, to reduce gasoline consumption 20 percent below projected 2017 levels, that equates to a figure that is below gasoline production today. So it would make little or no economic sense for refineries to expand.

Now, in the same thing and a good thing I would suggest is that diesel demand continues to rise, which means the economy is chugging along fairly well. To illustrate, we can do a lot of things in the refinery business, but it is very difficult for us to make diesel without making gasoline. So what will happen in 2017, again, assuming all of these things, all of these ifs come into play, and those are big ifs, sir, the first thing we would do is we back out all imports of gasoline, because the United States would end up being a net exporter of gasoline. Now, I asked if that is the public policy we are attempting to achieve here, if we are producing domestic gasoline that we can't use here because we would be saddled with a 20 percent reduction figure. And then in the case of weather disasters such as we witnessed 2 years ago with Katrina and Rita, what saved the supply in this country was the imports. Baking out imports and having the U.S. be a net exporter of gasoline, again, I think those are questions that have to be looked at, the long-term impacts, the unintended consequences of these massive mandates.

Mr. SULLIVAN. Thank you, sir. And Mr. Reid, is it true that oil companies are blocking wider use of E-85 by forbidding gas station owners to put in pumps? Are there any current legal impediments that prevent them from doing so?

Mr. REID. To the best of my knowledge, there is no blocking or preventing. There are legal impediments, in the sense that the retailers who are selling a branded motor fuel are required to identify their pumps with the trade name, trade address of their brand supplier. So if they are offering a product for sale at the outlet that is not supplied by their franchise contract supplier, they are obligated to protect the intellectual property rights of their supplier and ensure that the—let us just use as an example an E-85 pump—to make sure the consumer understands that the product they are selling is not a branded product of their supplier refiner company.

Mr. SULLIVAN. Thank you, sir. And Mr. Mitchell, how does the fuel costs of natural gas compare to the price of gasoline or diesel fuel?

Mr. MITCHELL. Well, currently, using \$7.61 for the price of natural gas and adding the amount to compress the fuel, transport it, collect margin and capital recovery, it is about \$1.95. The average gasoline price as of last week ran between about \$3.00 and \$3.20 cents, depending on whether it was standard or super leaded fuel, or unleaded. And with diesel, diesel is about \$2.95 and because of the BTU conversion, a natural gas equivalent gallon would be about \$2.17. I also mentioned that, through the home refueling device, since there is no capital recovery component for the homeowner, or essentially none, there is no margin. Then they would receive the natural gas at a gasoline gallon equivalent of about \$1.35, because that would be a home refueling unit installed in their garage.

Mr. SULLIVAN. Thank you, Mr. Mitchell, and thank you panelists. I yield back.

Mr. BUTTERFIELD. Thank you. The gentleman yields back. At this time, the chair recognizes the gentleman from Georgia, Mr. Barrow.

Mr. BARROW. Thank you, Mr. Chairman. I want to follow up on Representative Sullivan's questions just for a second. These questions might be most directed to you, Mr. Greco, and Mr. Drevna, if you want to chime in, that would be fine.

I heard Mr. Reid say earlier in his testimony that independent businesses are going to be leading the charge and I guess one of the questions is just how independent are businesses that are tied up in franchise agreements that end up constraining their choices and their options. For example, I heard you, Mr. Greco, talk about the importance of brand name protection, product ID and the importance of, I believe it was your, Mr. Reid, avoiding the problem of mis-fueling.

You want to make to sure that all of these things are tied up and yet the article that I just mentioned talks about things like ExxonMobil Corp's standard contract with its Exxon stations, it bars them from buying fuel from anyone but itself and they don't make E-85, so it essentially bars them from getting any E-85 fuel. ConocoPhillips, a number of the franchisees says the company doesn't allow E-85 sales on the primary island. BP guidelines for stations that carry the company name bar any mention of E-85 on the gasoline dispensers, on the perimeter signs of the light poles.

These are the sorts of things that franchisees encounter, so in addition to the problems we talked earlier about, just creating a sufficient supply of this stuff, we have franchise agreements which could effectively be getting in the way of people who might want to try and avail themselves of that option, so how independent can folks be if they are constrained in this way and basically what I am getting at is should Congress play a role in this? I am making the suggestion before—sometimes it is the best thing if the government is the heavy in the picture.

You represent all of your members you have got to address the interests of your members, as a whole. But sometimes, like Harry Truman said, we spend 95 percent of our time up here trying to persuade folks to do what is in the best interest to do, anyway. And sometimes government can play that role. If you were to come in and sort of make it plain that agreements cannot constrain or re-

strict folks in certain ways. Might that help solve the problem? One of your members want to go first, but be constrained by being put at a competitive disadvantage vis-a-vis others pull back. Is there a constructive role for us to play getting everybody onto the same playing field in clearing away these impediments which pop up in one form or another, these agreements?

Mr. REID. Can I respond to that?

Mr. BARROW. Yes, sure.

Mr. REID. As I mentioned, I don't believe that it is an issue, meaning there are contractual provisions. The Gasohol Competition Act of 1980 precludes the enforcement of those contractual provisions. As a business owner, I have the freedom to move forward with those opportunities if I so choose.

Mr. BARROW. But if you are contracting with a big guy and you are using their name, you are a franchisee, you have got to play by the rules of the franchisor.

Mr. REID. I am obligated to eligible property rights.

Mr. BARROW. Sure, but I am saying it goes beyond eligible property rights. If you say you can't buy anything from anybody else and they don't make it, it is not beyond the eligible property rights to make sure it can't be sold on a primary island. It has to be put somewhere. It is not allowing folks to get what they need if you tie it up in a contract. There may be no legal impediments in the sense that there is a statute prohibiting you from doing something, but if it is a contract that we enforce in a court of law, that ends up being a legal impediment.

Mr. REID. My point being that those contractual provisions are not enforceable in a court of law.

Mr. BARROW. Why not? Who says?

Mr. REID. It is under the Gasohol Competition Act of 1980.

Mr. BARROW. Well, if I am the owner of this independent business, I am not going to be able to fight that out in a court of law with Exxon. Mr. Dinneen, can you respond to this? Can you shed some light on this?

Mr. DINNEEN. I think there are some impediments to the marketplace moving toward E-85. There are some issues—pointed out to many of them. The suggestion that the Gasohol Competition Act of 1980 provides—wanting to go down this route some protection, I think is just not accurate. The Gasohol Competition Act of 1980 was very narrow. It only addressed credit cards exclusively and it didn't talk about prohibitions against putting an E-85 pump under the canopy.

Mr. BARROW. I don't think there is any statute about that, is there?

Mr. DINNEEN. No.

Mr. BARROW. OK.

Mr. DINNEEN. It might be something to look at, is how you could amend the Gasohol Competition Act to address some of these marketplace realities.

Mr. BARROW. Well, it is a sensitive subject, but it really is a friendly suggestion and talked about how maybe Congress can play a role in being the heavy in the picture, where everybody wants to go their own way, but it is in their best interest for everybody to

go the same way, but they are at a competitive disadvantage in going first. I have to yield, Mr. Chairman. Thank you.

Mr. BUTTERFIELD. Thank you, Mr. Barrow. The gentleman yields back. Looks like we have no more members on the Minority side or the Majority side. I will conclude, ladies and gentlemen, with just a few questions.

Let me start with Ms. Lowery. Ms. Lowery, Dr. Lashof has testified that the administration's Alternative Fuel Standard could increase greenhouse gas emissions, rather than decrease them. Do you agree that that is possible?

Ms. LOWERY. Actually, I think what is important is to look at the whole diversity of energy sources and look at the various streams and what the greenhouse gas emissions would be from those fuel sources. But from the Renewable Fuels Standards and the Alternative Fuel Standards, there could be great improvement in greenhouse gas emissions, so we need to look at all the different pathways.

Mr. BUTTERFIELD. Thank you. Dr. Lashof, my understanding is that the maximum feasible amount of corn-based ethanol is 14 to 17 billion gallons of ethanol per year by 2017. Do you agree with that number?

Mr. LASHOF. I have heard that number cited. I don't think I am in a good position to say whether that is true.

Mr. BUTTERFIELD. What do you think is the maximum feasible amount?

Mr. LASHOF. I think it is a somewhat elastic issue. I think that there is a potential to grow additional corn. I do think if you hit those lines, you are clearly going to be starting to diversify away from corn into other feedstocks, if you can expand much beyond that. It doesn't mean that I don't know that there is an absolute maximum that the market can produce.

Mr. BUTTERFIELD. Mr. Dinneen, do you want to take a stab at that?

Mr. DINNEEN. Yes, I think those analyses have been done and USDA has agreed with some of that, is looking at today's technology. But the fact of the matter is technology is evolving and there are companies working on biotechnology today that could potentially provide significantly increased yields on existing acreage that would allow that number to increase. But looking at today's technology where we are, yes, about 14 to 17 billion gallons of ethanol from grain is about the upper balance of what you could responsibly achieve.

Mr. BUTTERFIELD. Thank you. Mr. Greco, do you believe that it is reasonable to expect that the United States could meet a 35 billion gallon per year alternative fuel standard by 2017?

Mr. GRECO. As I think I pointed out in my testimony, we are very concerned about this transition phase where we are talking 10, 15 billion gallons that is realistic from corn. But beyond that, we are talking about billions of gallons from technologies that have not produced, commercially or economically, viable amounts yet. So if you are talking about doubling or tripling the known production capability of corn, which is a longstanding proven technology, it is hard to see us getting there in the next 5 years based on these assumptions and then ramping up as quickly as some of these pro-

posals would suggest, which is why we are supportive of technology reviews. So if Congress decides to go down that route, they can take a step back and check periodically to see if the technology where we think it is and if not, we need to adjust accordingly.

Mr. BUTTERFIELD. All right. Mr. Dinneen, let me go back to you for a moment. At our last hearing on alternative fuels, which was, I suppose, 2 or 3 weeks ago, a man by the name of Brian Foody, the president and CEO of Iogen, testified that the goals of 3 billion gallons of advanced fuels by 2016 and 21 billion gallons by 2022, which are both included in the Senate version, are both ambitious and achievable. Do you agree or disagree with him?

Mr. DINNEEN. Mr. Foody is a member of Renewable Fuels Association, so I wouldn't be so foolish as to disagree with him. But seriously, yes, you can certainly get those numbers. As I indicated in my testimony, I think the movement towards cellulosic ethanol is coming fast and furious. It will be commercialized far sooner than conventional wisdom suggests and those are numbers that would be achievable. You have seen dramatic in the grain-based ethanol industry just since the Energy Policy Act of 2005 was enacted. We doubled in size since then. We are going to double in size in another 18 months. Once the marketplace understands there is technology out there that has a marketplace for the product, the marketplace can respond very quickly.

Mr. BUTTERFIELD. Mr. Drevna, let me ask you a yes or no question. The Senate Energy Committee just voted on a provision that would require new—facilities to reduce the life cycle for greenhouse gas emissions from their fuel by 20 percent compared to conventional gasoline. Should all transportation fuels have to meet this standard?

Mr. DREVNA. Congressman, again, NPRA, we are oppose mandates. We think that on a going forward basis, as the technology is developed, as the right incentives, not giveaways, but the right incentives for individual companies, individual processes, technologies, feedstocks, it should be a level playing field for all. And if that happens, we believe we are going to get to where we should collectively want to go, as a nation, but to force feed things early on, and in all candor, without having the technologies available today, doesn't make any sense.

Mr. BUTTERFIELD. Thank you. I believe my time has expired. At this time, I am going to recognize the gentleman, my friend from the State of Washington, who announced to this committee a few weeks ago that he, himself, has an alternative flex fuel vehicle. Am I remembering that correctly, Jay?

Mr. INSLEE. Thankfully, you are right. No, I do. I have a car, it is a Toyota Prius and it has been a very great car and this fall, A123 battery company is offering a conversion kit with a lithium ion battery. You plug it into a plug-in vehicle, it will get 150 miles a gallon, run it for 1 cent a mile for somewhere between 20 and 40 miles and it is available this fall. You have got to put some cash down to get the conversion, but we are hoping our manufacturers really follow through with their efforts to really come up with production models.

I wanted to ask Dr. Lashof, my concern about going for a Renewable Fuels Standard to an alternative standard, it essentially al-

lows you to swallow, if possible, if I understand the administration proposal, to swallow the fuels that would be CO² reducers and go to fuels that were possibly even CO² increased. As I understand their proposal, they could have 90 percent of the entire requirement filled by coal versus liquid that is non-sequestered and end up with an 118 percent increase for every gallon they sell. Is that your understanding?

Mr. LASHOF. Yes, it is, Mr. Inslee. If you actually look at the legislation—it is 35 billion gallons wide open, there is no environmental performance standard associated with it, there is no requirement that that fuel be renewable. We heard the testimony from the first panel that that was their intent and that they would sort of let the marketplace sort it out and although they have expressed the expectation that cellulosic ethanol would play a role, there is no environmental performance or other incentives built into the proposal that would ensure that result.

And this juncture here is that they released an analysis when the President made his announcement of his policy, suggesting that their policy would reduce greenhouse gas emissions by about 170 million tons relative to the business-as-usual forecast, return gasoline based emissions to their current levels by 2017, so that is their projection. And the problem is that their policy doesn't really contain the performance standards that would in any way assure that you would actually achieve those numbers.

Mr. INSLEE. And I think you said something gracious about my bill that would plug that standard, so if you did, great. If you didn't, I hope you will put it in the record.

Mr. LASHOF. I did and thank you very much for your leadership in introducing that. I do think that if the goal is to get greenhouse gas reductions, the most effective and efficient way to do that is to actually have performance standard that requires that outcome and that is what your bill would do, so I think that is a very important way to—

Mr. INSLEE. Thank you. I appreciate that. I wanted to ask Mr. Drevna and Mr. Greco, what percentage of pumps today are controlled by companies, either by ownership or franchise agreements? What percentage of our pumps today are controlled by entities that do not distribute E-85? The number service stations today, what number of them, just percentage, ballpark figure, controlled by companies, refiners or distributors or whoever they are, who do not sell E-85?

Mr. DREVNA. I am going to defer to—

Mr. REID. I noted that approximately 95 percent of the motor fuel outlets in this country, of which there are approximately 165,000, are operated by independent businesses, not by vertically integrated major oil companies.

Mr. INSLEE. So you would say, you were saying 95 percent of these service stations are legally free to sell anything they want?

Mr. REID. That is correct.

Mr. INSLEE. So there are no franchise restrictions prohibiting them from selling E-85 or a competitor's product?

Mr. REID. Actually, 100 percent of these stations are free to sell what they want as long as it meets the EPA specifications.

Mr. INSLEE. I am really sorry I don't know the answer to this, because I should because I tried a case involving this at one time, but if I have a service station and I have a franchise from one of the big companies, let us just call it Acme Oil, there is nothing to prevent me from selling E-85 distributed to me by Acme Oil's competitor in those franchise agreements?

Mr. REID. With respect, we covered this territory a few minutes ago.

Mr. INSLEE. I am sorry.

Mr. REID. And there is some confusion, apparently, about the affordability of the Gasohol Competition Act of 1980 and my counsel has generously offered to provide the committee with a memo that fleshes out the provisions of that act and how it applies to the more modern environment.

Mr. INSLEE. OK, is there anything you can tell me, just generally, whether there is any—

Mr. REID. There are no legal impediments.

Mr. INSLEE. I see. OK. Thank you.

Mr. BUTTERFIELD. I thank the gentleman. Looks like our final witness is the gentleman from Texas, Mr. Gene Green.

Mr. GREEN. Mr. Drevna, following up on the questions earlier from my colleague from Oklahoma, he talked about expansion projects, refinery expansion projects being cancelled. Will we see, if we mandate other uses, whether it is E-85 or something else, do you see any concerns that these refineries will be cancelled?

Mr. DREVNA. Congressman Green, clearly—and I would be naive to sit here and say that the refining industry of 2007 is going to be the same refining industry that we are going to see in 2017. We are constantly evolving, we are constantly changing. However, given the fact that we have yet to, for lack of a better term, swallowed the 7.5 million gallons, which we will. We will surpass that, simply because it is needed. Ethanol is fine blend stock and it is wet, so we need all the blend stock we can get, given the supply situation we are in.

But if you are a refinery executive or sitting in the board room of a major refiner, you have to take pause and think what am I going to look like in 5, 10, 15, 20 years from now? Those decisions have to be made today. And given the debate going on in Congress and other places these days, you would have to consider that these folks are going to take great pause before they commit huge capital to refinery expansion projects when we are being told on the other hand in 10 years from now, we want you to reduce gasoline consumption by 20 percent. So it is just a dichotomy of messages being sent to my industry.

Mr. GREEN. One of the concerns I have is the impact on pricing. We are already hearing complaints from all over the country about the high price of gasoline right now. What impact would either cancellation of those expansion plans or additional closing of refineries have, even though we may have an alternative product coming on, whether it be ethanol, whether it be E-85, whether it be coal-to-liquids, do you see even more volatility in the price structure for what people pay at the pump?

Mr. DREVNA. Congressman, it with some trepidation that I even talk about what we think prices are going to be, because histori-

cally, not in my industry, but I think the rest of the country, has been very good at predicting anything like that. But given the fact that—and I only know what I know today and today and—if you look at where prices of gasoline, where the price of ethanol is and as more ethanol plans come on line, I think those margins are going to—that cost price should come somewhere soft. But who knows where? It is one of those things we are hearing—it is just around the corner, it is just around the corner. All this technology is just around the corner but again, that gives no great solace to refinery managers who have to make significant investments.

The other thing we are talking about is E-85. On a unit-per-unit basis, right now ethanol is selling a heck of a lot higher than gasoline. That is just on a volumetric basis. When you compound the fact that it is a 25 to 30 percent fuel penalty, we are going to have to see ethanol come way down before it becomes a competitor in price to gasoline. Then you are going to have all these ethanol plants out there who are going to be coming back to Congress saying we are in financial straits here because we are not meeting our investment strategies. So these are the concerns that we have, as refiners. And again, I think it goes back to what Congressman Barrow said, it is just not a chicken and a egg thing, it is the whole barnyard.

Mr. GREEN. Mr. Chairman, I have a number of other questions. I know I am almost out of time, but I would just if we could submit questions in writing. Let me follow up with that. Mr. Dinneen—

Mr. BUTTERFIELD. Let me offer a suggestion to you. We are going to have a second round of 1-minute questions, so why don't you go ahead and take your 1 minute now?

Mr. GREEN. OK, great.

Mr. BUTTERFIELD. If that meets the approval of the committee. So you have an additional minute.

Mr. GREEN. Mr. Dinneen, let me be brief. I have a very urban district and I don't hear from agriculture groups very often, but now that the farm bill has come around I am hearing more and more about agricultural interest in energy policy that are not ethanol producers. Livestock producers are having increasing feed prices and increasing—should we avoid further increases in renewable fuels mandate until we fully develop cellulosic ethanol so that we are not Peter's pantry to pay for Paul's gas tank?

Mr. DINNEEN. Congressman, thank you. Actually, I think the marketplace is already responding. You saw corn prices being reduced as soon as the Crop Intention Report came out last month, showing that farmers have responded to the market signal that was given and increased the corn planted or acres intended to be planted by more than 15 percent. The marketplace will respond, but I think you can't just look at this in a vacuum. My good friend, Mr. Drevna, just indicated that somehow that ethanol pricing today was significantly higher than gasoline on a volume basis and that is just flat out not true. Indeed, ethanol is significantly cheaper than is gasoline today, even before the taxes, but—

Mr. GREEN. Dr. Lashof, you testified that without adequate guidelines, large scale biofuels production carries great risk to our lands, forests, et cetera, and I want to focus on that on the climate. Your testimony includes a chart that shows ethanol production ac-

tually produces more greenhouse gases than gasoline and that the amount of greenhouse gas emissions for ethanol in part depend on the source of the power used, coal, natural gas, et cetera. Do you think that the fact that using all natural gas in corn ethanol production raises natural gas prices—it is driving utilities to pursue new coal plants, such as the former TXU proposal and have major environmental organizations factored in their thinking on ethanol on this?

Mr. LASHOF. Well, thank you for the question. I do show one case where an ethanol plant is producing more greenhouse gases than gasoline. It is a coal fired plant that uses corn that was grown in a very energy intensive way. The other cases we see benefits relative to gasoline that varies depending on what energy source is used for the feedstock, so we would like to see the ethanol industry move away from natural gas as its process energy source. If it moves to biomass, which could be collected along with the corn, then there is an opportunity for much greater greenhouse gas benefits and we could avoid that negative impact on natural gas prices, so I think, again, the type of greenhouse gas performance standard that Mr. Inslee has proposed would create an incentive to move toward more efficient processes—

Mr. BUTTERFIELD. The gentleman's time has expired. The gentleman from Oklahoma is recognized for 2 minutes.

Mr. SULLIVAN. Thank you, Mr. Chairman. This question is directed to Mr. Greco, Mr. Drevna. If you would both answer this, please. Many States and even localities have implemented or are considering proposals to create their own biofuels mandates. What is wrong with letting States and localities implement their own renewable fuels mandates? If you could both comment.

Mr. GRECO. Well, thank you for the question. Individual State mandates fracture and reduce the flexibility of our fuel supply system. One of its strengths is the flexibility to move fuel around to meet needs, both anticipated and unanticipated and when you start having individual local biofuels or ethanol mandates, you are now creating localized markets that have their own requirements that are restricting the flow of commerce and are, in effect, a problem, particularly when you talk about a larger mandate. If you are focusing on a national fuels mandate, you really don't need the individual State ones, because they are just restricting the flow of fuel and an increase in price volatility.

Mr. DREVNA. I agree with everything that Bob has said there, Congressman, and in addition, what would we have to do, as refiners, depending upon individual States, we have a pretty sophisticated fuel distribution, supply and distribution network throughout the country and even as we saw and have seen, with the implementation of the ultra low sulfur diesel, it was a concern how we were going to add another product into an already, pretty constrained pipeline system.

If we, as refiners, have to make different blend stocks for different States or different localities, that is going to put a major strain on the refinery system and be a real strain on the delivery system to these things. And it is going to be an X product going here, a Y product going there and it is just going to cost more to make. It is going to cost more to ship and it is an affront to a na-

tional policy, if indeed, a national policy is renewable fuels, again, NPRA says let the marketplace dictate where those fuels should be used in the best way possible.

Mr. BUTTERFIELD. The gentleman's time has expired. The gentleman from Washington has 2 minutes.

Mr. INSLEE. Thank you, Mr. Chairman. Mr. Reid, I want to make sure I understood your answer about this issue. I understood you to say there was no legal impediment for the stations selling E-85 and I was just looking at a Wall Street Journal article of April 2, 2007 and it says, "For instance, franchises sometimes are required to purchase all the fuel they sell from the oil companies. Since oil companies generally don't sell E-85, the stations can't either, unless the company grants an exception and lets them buy from another supplier."

It moves on to say, "ExxonMobil Corporation's standard contract with Exxon stations bars them from buying fuel from anybody but itself and it doesn't sell E-85. A spokesman for ExxonMobil says it makes exceptions case by case." Now, I don't mean any disrespect to Exxon, they just happen to be the one they quote in the article. Is that the situation that, in fact, the contracts bar these franchisees from selling unless they get specific approval? Is that generally the situation in the industry?

Mr. REID. I would submit that the Wall Street Journal reporter is incorrect in his story.

Mr. INSLEE. In what regard?

Mr. REID. OK, the Gasohol Competition Act of 1980 prohibits the enforcement of those types of contractual provisions. It is that simple.

Mr. INSLEE. How this story gets out that an Exxon spokesman, according to the Wall Street Journal, says they make exceptions to their contracts case by case?

Mr. REID. We have offered to prepare a memo which we will submit to the committee and hopefully, that will provide ample explanation.

Mr. INSLEE. Thank you very much.

Mr. BUTTERFIELD. I thank the gentleman. The gentleman from Georgia, 2 minutes.

Mr. BARROW. Thank you, Mr. Chairman. Ms. Lowery, I want to turn to the commitment that your firm has made to make sure that—I think that your testimony, you are prepared to make fully half of your annual vehicle production biofuel capable by 2012 provided there is ample availability and distribution as part of an overall national energy strategy. What is the tripping point, what do you need in order to be able to meet your commitment?

Ms. LOWERY. Well, what we need, we are doubling our production through 2010, so that is making sure there—

Mr. BARROW. Yes, but that is not half your vehicles.

Ms. LOWERY. Right.

Mr. BARROW. It is doubling the small amount to twice the small amount.

Ms. LOWERY. Right.

Mr. BARROW. What are you going to need out there in the economy, in the infrastructure world in order to be able to follow through and make half your production biofuel ready?

Ms. LOWERY. What we need is the E-85 infrastructure developed, so we need more E-85 readily accessible to our flex fuel——

Mr. BARROW. How much is enough in the absence of a mandate—I am not proposing that, but in the absence of a mandate, how much is enough for you all to go ahead and do it on your own?

Ms. LOWERY. We don't have a specific number. What we think is important is that our customers that are driving that are driving those flex fuel vehicles today should have——

Mr. BARROW. Do you have a general number? A percentage of a penetration in the market? We have heard 50,000 out of 170, 165,000. Is that what you are going to have to have?

Ms. LOWERY. Well, right now what we have is we definitely made progress with the 1,200 stations. We certainly have to have certainly more than that. I don't have a specific number.

Mr. BARROW. Mr. Reid, you represent an awful lot of people who are very important to the folks I represent, so I want to ask you, in following up on what Ms. Lowery said, what can we do in Congress to help you and your members make E-85 infrastructure more available? What is the most important thing we can do to help you all deliver on that so General Motors can turn and can deliver on their commitment?

Mr. REID. In my opinion, before E-85 is widely available, there needs to be more supply. Even if we had E-10 available in every gallon of gasoline that sold in this country, we would need triple the current amount of ethanol that is being produced. That is 10 percent ethanol, 90 percent gasoline. E-85, 85 percent ethanol, 15 percent gasoline. I think we are just a little bit ahead of the power curve today.

Mr. BARROW. You are waiting for the supply before you will build the infrastructure to deliver it, it sounds to me like.

Mr. REID. We need supply. We need vehicles that can utilize the supply, if you are focused on E-85. The flex fuel vehicles, even producing at the increased pace that they are projecting, will still only be, in 10 years, maybe 20 percent of the total vehicle pool. It takes time to turn over 140, 50 million vehicles.

Mr. BARROW. I just wanted to know what we can do to help and you can amplify later on. Thank you, Mr. Reid. Mr. Chairman, I yield.

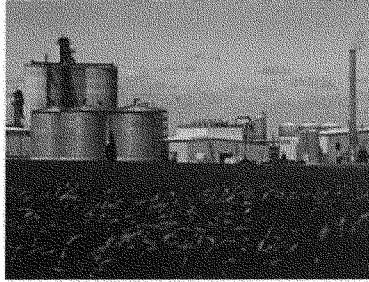
Mr. BUTTERFIELD. Thank you, Mr. Barrow. I believe that completes the testimony today. I want to thank each one of you for coming forward and I apologize for the inconvenience this afternoon, but that is just the way the House works. Let me say to you that any follow-up questions that any of the members of the committee might have may be presented to you in writing and I would ask your courtesy in responding to each one of those questions. All right. I am a former judge, I will say court is in recess.

[Whereupon, at 3:00 p.m., the subcommittee was adjourned.]

[Material submitted for inclusion in the record follows:]

Ethanol's impact multifold

Corn planting boom underway as farmers cash in, but consumers may ultimately pay



KHQA file footage

Posted: Monday, May 07, 2007 at 5/7/2007 10:58:28 AM

(AP) -- BLOOMINGTON, Ill. (AP) - Farmers fortunes rise and fall every year with the weather.

But experts say timely rains are critical this year to supply enough corn to meet growing demand for ethanol.

They say a bumper crop could hold prices steady while yielding enough corn to meet the needs for ethanol, livestock farmers and other food production.

A drought, on the other hand, could squeeze the market and send corn prices spiraling.

Corn prices that hovered around \$2 a bushel for a decade have nearly doubled in the last year due to ethanol demand.

Analysts say the combination of ethanol and weather uncertainties will make for a volatile corn market this summer.

Many farmers and analysts say corn prices likely won't dip below \$3 per bushel this year due to ethanol demand.

But others say prices could sink back to \$2 a bushel with a record crop and could top \$5 a bushel if there's a drought.

Mike Olson is among farmers who think there's extra money to be made the next few years to supply surging demand for corn-based ethanol.

Olson plans to bump corn by 15 percent this year on his central Illinois farm that harvested a 50-50 split of corn and soybeans last fall.

Experts say farmers can pocket an extra \$100 an acre or more from corn under today's high prices.

But some farmers are more cautious, saying they've seen prices soar then fall plenty of times over the last three decades.

Vance Bauer says he'll stick with his usual 50-50 mix of corn and soybeans this year on his farm near Gowrie, Iowa. Bauer says he's optimistic about ethanol but doesn't want to put all of his eggs in one basket.

The expected corn planting rush to feed growing ethanol demand will spread from the Corn Belt to the land of cotton.

About 90.5 million acres of corn are expected to be planted nationwide this year, the most since 95.5 million acres were planted in 1944.

The five top corn-producing states (Iowa, Illinois, Nebraska, Minnesota and Indiana) account for 5.1 million of the projected 12.2 million new acres of corn.

But the sharpest increases are expected where cotton has been king for generations.

Arkansas, Louisiana and Mississippi are expected to boost corn acreage by 133 percent to 195 percent. Combined, the three states are expected to add 1.2 million acres of corn while trimming cotton production by more than a million acres.

Billy Joe Ragland says high corn prices offer a chance to make a little money for a change on his long-time cotton farm in central Mississippi.

Corn prices have been pumped to near records by more than a hundred ethanol plants that have sprouted as America seeks renewable alternatives to foreign oil.

Corn will squeeze out soybeans across the Midwest and even cotton in parts of the Deep South according to the U.S. agriculture department's planting forecast for this year's crop.

But some farmers and experts warn that there's no guarantee prices will hold.

They say prices have nowhere to go but down if the market is flooded with corn.

And not everyone has forgotten how a massive grain deal with the Soviet Union in the early 1970s and the 1996 drought in China shot corn prices to record highs -- prices that later wilted.

The ethanol boom that's driven up corn prices could ultimately hit U.S. consumers in the pocketbook.

About half of the nation's corn crop feeds livestock and poultry, so high prices could mean more expensive meat and eggs on grocery shelves.

Farm officials say the livestock and poultry industries will likely try different feeding options or selling animals at lower weights before passing along higher prices to consumers.

Even if that fails, experts say it likely would be two or three years before shoppers see significantly higher prices. U.S. Agriculture Secretary Mike Johanns has downplayed ethanol's impact on food costs, saying food prices typically rise 2 to 3 percent a year based on a dozen different factors.

Some experts maintain there will be enough corn for everyone if a forecast for the largest U.S. corn planting since 1944 bears out.

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Defenders of Wildlife * Environmental Working Group * Friends of the Earth
 Institute for Agriculture and Trade Policy * The Minnesota Project
 National Environmental Trust * Natural Resources Defense Council * Sierra Club
 Sustainable Agriculture Coalition * U.S. PIRG * Western Organization of Resource Councils
 World Wildlife Fund

March 27, 2007

Dear Representative:

On behalf of our millions of members and activists we urge you to support sustainably produced bioenergy as a key component of a comprehensive strategy to reduce America's dangerous dependence on oil and to help solve global warming. Done right, bioenergy holds great potential to advance essential environmental and energy security goals. Pursued without adequate guidelines, however, bioenergy production carries grave risk to our lands, forests, water, wildlife, public health and climate. We therefore urge you to support the energy efficiency policies and performance standards that will ensure bioenergy meets its promise while avoiding collateral environmental damage.

The starting point for any constructive bioenergy policy, from increasing the size of the renewable fuel standard to enhanced biofuels programs in the Farm Bill, has to be much greater end-use energy efficiency. Efficiency policies such as raising Corporate Average Fuel Economy standards for vehicles and promoting smart growth in our cities are essential to reduce oil demand and ensure that our lands are not put under excessive pressure to produce biofuel feedstocks.

If not carefully managed, increased production of biofuels has the potential to cause widespread environmental devastation. Accelerated corn cultivation for ethanol, for example, threatens to deplete water tables, magnify contamination by fertilizers, pesticides, and herbicides, and undermine vital conservation programs like the Conservation Reserve Program. On farms and in forests across the country and abroad, imprudent biomass harvesting would cause soil erosion, water pollution, and habitat destruction, while also substantially reducing the carbon uptake of land. Advancing a biofuels policy that leads to conversion of land into a type that lowers its carbon uptake potential is a particularly perverse result for a policy that is intended to reduce global warming pollution.

Fortunately, we can manage and mitigate these bioenergy impacts through thoughtful legislation. Developing a sustainable bioenergy industry will require low carbon and other environmental performance standards. Attached, we respectfully include a set of guiding principles that provide the basis for such standards.

New policies are also needed to accelerate the transition to bioenergy produced from feedstocks such as cellulosic crops grown in sustainable systems. These policies include research and development on feedstocks such as native perennials, incentives for bioenergy production

facilities with a preference for local ownership, and programs that help farmers make the transition to growing feedstocks in sustainable agronomic systems.

Again, bioenergy holds great promise as a tool for reducing global warming pollution, breaking our dangerous oil addiction, and revitalizing rural economies, as long as we shape the nascent bioenergy industry to provide these benefits in a sound and truly sustainable fashion. We look forward to working with you on this important and challenging issue.

Sincerely,

Anna Aurilio
Director
Washington Office
U.S. PIRG

Jason Patlis
Vice President
U.S. Government Relations
World Wildlife Fund

Mary Beth Beetham
Legislative Director
Defenders of Wildlife

Sandra Schubert
Director of Government Affairs
Environmental Working Group

Kevin S. Curtis
Senior Vice President
National Environmental Trust

Karen Wayland
Legislative Director
Natural Resources Defense Council

Donley Darnell
Chairman
Western Organization of Resource Councils

Sara Zdeb
Legislative Director
Friends of the Earth

Jim Harkness
President
Institute for Agriculture and Trade Policy

Dave Hamilton
Director
Global Warming & Energy Programs
Sierra Club

Loni Kemp
Senior Policy Analyst
The Minnesota Project

Martha Noble
Senior Policy Associate
Sustainable Agriculture Coalition

Bioenergy Feedstock Guiding Principles

- *The use of bioenergy must reduce greenhouse gas emissions.* Depending on how it is produced, bioenergy can significantly lower or increase greenhouse gasses. Key factors include the amount and sources of energy used to produce biofuels, and the potential direct or indirect conversion of carbon-sequestering forests and grasslands to lower carbon bioenergy feedstocks. To assure benefits, new incentives and requirements for increased use of biofuels need to be tied to significant reductions in the greenhouse gas intensity of these fuels. Practices that negate the greenhouse gas benefits of biofuels include conversion of native grasslands to produce biofuel feedstocks, loss of old growth forests, intensified tillage, and use of coal to power ethanol plants.
- *Biomass used for bioenergy has to be renewable.* Biomass must be regrown on site, recapturing its released carbon, so that it is genuinely sustainable – unless it is the by-product of activity with independent, over-riding social utility (like removal of vegetation immediately around wildland-interface homes).
- *Bioenergy feedstocks must not be grown on environmentally sensitive lands.* Such lands include: old growth forests; wilderness study areas; roadless areas on national forests; native grasslands; important wildlife habitat; ecosystems that are intact, rare, high in species richness or endemism, or exhibit rare ecological phenomena.
- *Conversion of natural ecosystems must be avoided.* Habitat loss from the conversion of natural ecosystems represents the primary driving force in the loss of biological diversity worldwide. Activities to be avoided include those that alter the native habitat to such an extent that it no longer supports most characteristic native species and ecological processes.
- *Exemptions and waivers from environmental rules must not be used to promote biomass production or utilization.* Trading one serious environmental harm for another is poor policy. Our environmental laws and regulations act as a fundamental system of checks and balances to guard against just such collateral damage and the promotion of bioenergy production and utilization must in no way be exempted.
- *Conservation and Wetland Reserve Programs supported by the Farm Bill must be managed for their conservation benefits.* These programs protect marginal lands, water quality, soil, and wildlife habitat. Enrolled lands need to be managed principally for these important values, not bioenergy feedstocks.
- *Independent certification, market incentives, and minimum performance requirements are necessary to ensure that bioenergy feedstocks are produced using sustainable practices.* Certification standards for biomass from private lands must address key environmental and social objectives, such as protection of wildlife habitat, prevention of erosion, conservation of soil and water resources, nutrient management, selection of appropriate feedstock species, and biologically-integrated pest management. New policies are needed to ensure that producers, refiners and distributors adhere to minimum performance requirements and have incentives to maximize environmental performance at each step.
- *Stringent safeguards must be established for bioenergy production from feedstock derived from federal land.* Federal lands, including wildlife refuges, BLM lands, national forests and grasslands, are held subject to the public's interest in their non-commodity values. They are not appropriate for large-scale, sustained biomass sourcing.

U.S. Department of Energy - Energy Efficiency and Renewable Energy
Alternative Fuels and Advanced Vehicles Data Center

Alternative Fueling Station Total Counts by State and Fuel Type

Below you will find a listing of Alternative Fuel Station counts by state and fuel type, CNG-Compressed Natural Gas, E85-85% Ethanol, LPG-Propane, ELEC-Electric, BD-Biodiesel, HY-Hydrogen and LNG-Liquefied Natural Gas.

The stations are independently verified by the AFDC on a routine basis. This page is dynamically generated. If you're using a specialized screen reader and are having difficulty understanding the page content, please contact the AFDC Webmaster for assistance.

[Learn about our data collection methodologies.](#)

Station data last updated on 12/04/2008

STATE	BD	CNG	E85	ELEC	HY	LNG	LPG	Totals by State
Alabama	11	3	6	0	0	0	40	60
Alaska	0	1	0	0	0	0	10	11
Arizona	10	40	23	5	1	5	51	135
Arkansas	2	3	6	0	0	0	37	48
California	35	185	13	345	26	28	199	831
Colorado	18	18	66	2	0	0	43	147
Connecticut	1	9	4	3	1	0	15	33
Delaware	3	1	1	0	0	0	3	8
Dist. of Columbia	1	1	3	0	1	0	0	6
Florida	12	15	16	3	2	0	47	95
Georgia	28	18	29	0	0	0	37	112
Hawaii	7	0	0	4	1	0	3	15
Idaho	6	7	5	0	0	1	25	44
Illinois	4	17	182	5	1	0	54	263
Indiana	6	14	113	0	0	0	31	164
Iowa	5	0	106	0	0	0	24	135
Kansas	5	2	23	0	0	0	44	74
Kentucky	1	0	11	0	0	0	13	25
Louisiana	1	5	3	0	0	0	9	18
Maine	5	1	0	0	0	0	8	14
Maryland	7	14	12	0	0	0	13	46
Massachusetts	7	11	1	18	1	0	23	61
Michigan	17	13	60	0	7	0	69	166
Minnesota	1	1	353	0	0	0	30	385
Mississippi	5	0	2	0	0	0	33	40
Missouri	5	6	87	0	1	0	65	164
Montana	4	3	2	0	0	0	31	40
Nebraska	3	2	35	0	0	0	18	58
Nevada	12	11	16	0	2	0	28	69

New Hampshire	11	3	0	8	0	0	11	33
New Jersey	0	11	0	0	0	0	10	21
New Mexico	7	11	8	0	0	0	49	75
New York	5	91	17	1	1	0	29	144
North Carolina	66	12	14	0	0	0	44	136
North Dakota	0	4	29	0	0	0	14	47
Ohio	24	8	64	0	1	0	66	163
Oklahoma	6	51	6	0	0	0	64	127
Oregon	36	12	8	15	0	0	29	100
Pennsylvania	7	25	19	0	2	0	63	116
Rhode Island	2	7	0	2	0	0	4	15
South Carolina	73	4	72	0	1	0	20	170
South Dakota	0	0	79	0	0	0	17	96
Tennessee	34	3	25	0	0	0	42	104
Texas	52	17	35	1	0	4	487	596
Utah	7	62	5	0	0	0	22	96
Vermont	2	1	0	2	1	0	5	11
Virginia	12	9	6	1	1	0	19	48
Washington	38	14	14	2	0	0	52	120
West Virginia	1	2	3	0	0	0	7	13
Wisconsin	1	18	113	0	0	0	41	173
Wyoming	14	8	6	0	0	0	27	55
Totals by Fuel:	620	774	1701	417	51	38	2125	5726

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U.S. House of Representatives
Committee on Energy and Commerce
Washington, DC 20515-6115

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August 31, 2007

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Mr. Charles T. Drevna
 Executive Vice President
 NPRA
 1899 L Street, N.W.
 Suite 1000
 Washington, D.C. 20036

Dear Mr. Drevna:

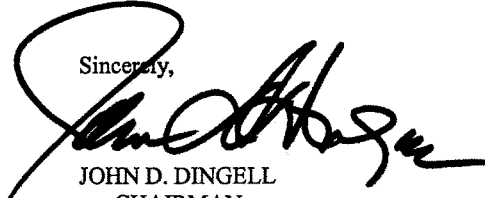
Thank you for appearing before the Subcommittee on Energy and Air Quality on Tuesday, May 8, 2007, at the hearing entitled "Alternative Fuels: Current Status, Proposals for New Standards, and Related Infrastructure Issues." We appreciate the time and effort you gave as a witness before the subcommittee.

Under the Rules of the Committee on Energy and Commerce, the hearing record remains open to permit Members to submit additional questions to the witnesses. Attached are questions directed to you from a Member of the Committee. In preparing your answers to these questions, please address your response to the Member who has submitted the questions and include the text of the Member's question along with your response.

To facilitate the printing of the hearing record, your responses to these questions should be received no later than the close of business on **Monday, September 17, 2007**. Your written responses should be delivered to **2125 Rayburn House Office Building** and faxed to **(202) 225-2899** to the attention of Rachel Bleshman. An electronic version of your response should also be sent by e-mail to Ms. Bleshman, at rachel.bleshman@mail.house.gov. Please send your response in a single Word formatted document.

Mr. Charles T. Drevna
Page 2

Thank you for your prompt attention to this request. If you need additional information or have other questions, please contact Rachel Bleshman at (202) 225-2927.

Sincerely,

JOHN D. DINGELL
CHAIRMAN

Attachment

cc: The Honorable Joe Barton, Ranking Member
Committee on Energy and Commerce

The Honorable Rick Boucher, Chairman
Subcommittee on Energy and Air Quality

The Honorable J. Dennis Hastert, Ranking Member
Subcommittee on Energy and Air Quality

The Honorable Fred Upton, Member
Subcommittee on Energy and Air Quality

Charles T. Drevna
Executive Vice President



NPRA

National Petrochemical & Refiners Association

1899 L Street, NW
Suite 1000
Washington, DC
20036-3896

202.457.0480 voice
202.457.0486 fax
cdrevna@npa.org

September 17, 2007

The Honorable John D. Dingell, Chairman
Committee on Energy and Commerce
U.S. House of Representatives
2125 Rayburn House Office Building
Washington, D.C. 20515-6115

Dear Chairman Dingell:

I was pleased to testify before the Subcommittee on Energy and Air Quality on Tuesday, May 8, 2007, at the hearing entitled "Alternative Fuels: Current Status, Proposals for New Standards, and Related Infrastructure Issues."

Please find attached my response to the additional questions sent by Congressman Upton on August 31, 2007.

NPRA and its members look forward to working further with you, your staff and the entire Energy & Commerce Committee on this and other related issues. Please contact me with any additional questions.

Sincerely,

Charles T. Drevna
Executive Vice President

Attachment

cc: The Honorable Fred Upton, Member
Subcommittee on Energy and Air Quality

The Honorable Joe Barton, Ranking Member
Committee on Energy and Commerce

The Honorable Rick Boucher, Chairman
Subcommittee on Energy and Air Quality

The Honorable J. Dennis Hastert, Ranking Member
Subcommittee on Energy and Air Quality

**Follow Up Questions of The Honorable Fred Upton
for the Subcommittee on Energy and Air Quality Hearing on Tuesday, May 8, 2007**

Question 1: Will a substantially expanded renewable fuels mandate suppress future domestic refining capacity?

Answer:

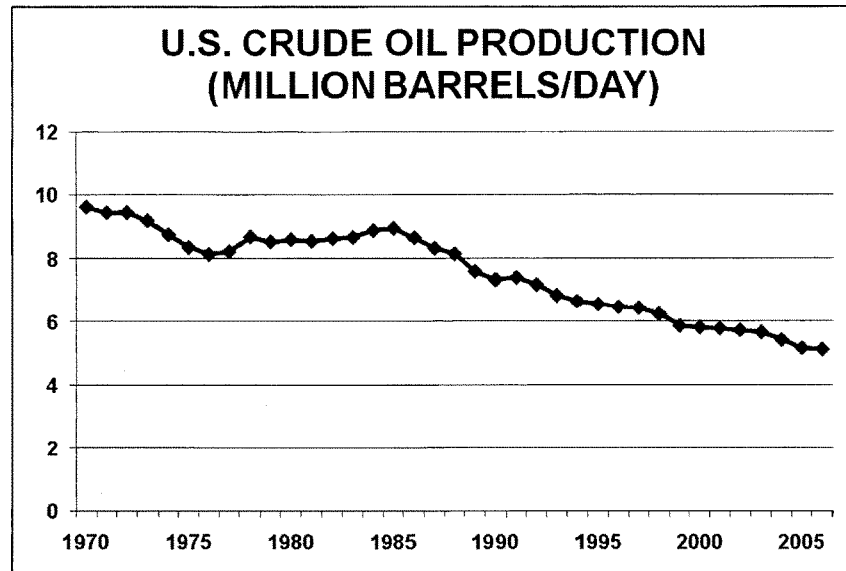
The domestic refining industry is likely to look upon a substantially expanded renewable fuels mandate as adding significant more risk to investments in capacity expansions. Over the last 14 years, the domestic refining industry has expanded capacity, equivalent to building a new world-class refinery each year. However, a continuation requires certainty that attracts capital investment and a substantially expanded renewable fuels mandate would not provide the necessary certainty.

Talk on Capitol Hill and within the administration regarding dramatic expanded renewable fuels mandates and the imposition of punitive taxes on the oil and gas industry has created uncertainty with regard to future investment decisions. Such uncertainty has already lead some industry members to scale back planned capacity expansions. Last year, planned refinery capacity expansions for 2007 – 2012 were estimated to add approximately 1.9 million barrels per day of gasoline supply to the market. Earlier this year, Joanne Shore of the Energy Information Administration told Congress that number is now down to a little over one million barrels per day – representing an almost one million barrel per day decrease.

Question 2: What steps can be taken to reduce the nation's reliance on foreign imports and enhance our nation's energy security?

Answer:

U.S. crude oil production has declined since 1970 (see the chart below). Congress should increase access to domestic oil and natural gas resources. Higher domestic production of crude oil and natural gas would reduce our reliance on foreign imports and enhance our nation's energy security. While renewables will play a vital role in the nation's transportation fuel supply, domestically available oil and natural gas supplies, both on and off-shore, can be produced with state-of-the-art environmental safeguards. Further, fossil fuels, and particularly oil and natural gas, will continue to be a major component of the nation's energy supply. These domestic resources are key if the U.S. is to limit its reliance on imports of foreign energy supplies.



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August 31, 2007

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The Honorable Alexander A. Karsner
 Assistant Secretary
 Energy Efficiency and Renewable Energy
 U.S. Department of Energy
 1000 Independence Avenue, S.W.
 Washington, D.C. 20585

Dear Mr. Karsner:

Thank you for appearing before the Subcommittee on Energy and Air Quality on Tuesday, May 8, 2007, at the hearing entitled "Alternative Fuels: Current Status, Proposals for New Standards, and Related Infrastructure Issues." We appreciate the time and effort you gave as a witness before the subcommittee.

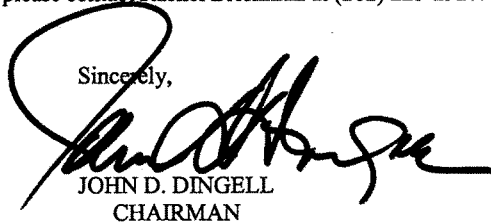
Under the Rules of the Committee on Energy and Commerce, the hearing record remains open to permit Members to submit additional questions to the witnesses. Attached are questions directed to you from certain Members of the Committee. In preparing your answers to these questions, please address your response to the Member who has submitted the questions and include the text of the Member's question along with your response.

To facilitate the printing of the hearing record, your responses to these questions should be received no later than the close of business on **Monday, September 17, 2007**. Your written responses should be delivered to **2125 Rayburn House Office Building** and faxed to **(202) 225-2899** to the attention of Rachel Bleshman. An electronic version of your response should also be sent by e-mail to Ms. Bleshman, at rachel.bleshman@mail.house.gov. Please send your response in a single Word formatted document.

The Honorable Alexander A. Karsner
Page 2

Thank you for your prompt attention to this request. If you need additional information or have other questions, please contact Rachel Bleshman at (202) 225-2927.

Sincerely,



JOHN D. DINGELL
CHAIRMAN

Attachment

cc: The Honorable Joe Barton, Ranking Member
Committee on Energy and Commerce

The Honorable Rick Boucher, Chairman
Subcommittee on Energy and Air Quality

The Honorable J. Dennis Hastert, Ranking Member
Subcommittee on Energy and Air Quality

The Honorable Michael C. Burgess, Member
Subcommittee on Energy and Air Quality

The Honorable Fred Upton, Member
Subcommittee on Energy and Air Quality



Department of Energy
Washington, DC 20585

October 9, 2007

The Honorable John D. Dingell
Chairman
Committee on Energy and Commerce
U.S. House of Representatives
Washington, DC 20515

Dear Mr. Chairman:

On May 8, 2007, Alexander Karsner, Assistant Secretary, Office of Energy Efficiency and Renewable Energy, testified regarding "Alternative Fuels: Current Status, Proposals for New Standards, and Related Infrastructure Issues."

Enclosed are the answers to five questions that were submitted by Representatives Burgess and Upton to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

A handwritten signature in black ink, appearing to read "Lisa E. Epifani".

Handwritten initials in black ink, possibly "LE".

Lisa E. Epifani
Assistant Secretary
Congressional and Intergovernmental
Affairs

Enclosures

cc: The Honorable Joe Barton, Ranking Member
Committee on Energy and Commerce

The Honorable Rick Boucher, Chairman
Subcommittee on Energy and Air Quality

The Honorable J. Dennis Hastert, Ranking Member
Subcommittee on Energy and Air Quality

The Honorable Michael C. Burgess, Member
Subcommittee on Energy and Air Quality

The Honorable Fred Upton, Member
Subcommittee on Energy and Air Quality



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QUESTION FROM REPRESENTATIVE BURGESS

Q1. I understand that beginning Model Year 2004, on-road diesel passenger cars must meet the same Tier 2 Bin 5 standard that gasoline passenger cars must meet for particulate matter, NOX, etc.

Since diesel engines are on average thirty percent more efficient, aren't we getting more bang for our emissions buck when we use diesel?

A1. Yes, diesel-engine-powered passenger cars offer significantly higher fuel economy than gasoline vehicles. The higher fuel economy is not accounted for in emissions testing. However, each vehicle manufactured does not need to meet the federal Tier 2 Bin 5 emissions standard as long as the manufacturer's fleet average meets the standard. This gives vehicle manufacturers flexibility by allowing vehicles to be sold that are above and below the regulation.

QUESTION FROM REPRESENTATIVE UPTON

- Q1. Has the Department of Energy studied the impact on price and supply of gasoline and diesel fuel upon full implementation of a substantially expanded renewable fuels mandate?
- A1. Although EERE has not performed such studies, the Energy Information Agency has recently completed a study which examines the impact of implementing a 25% renewable portfolio standard along with a 25% transportation fuel displacement requirement. The report indicated that while consumption of petroleum products would be significantly reduced under that scenario, the projected retail price of gasoline would increase. Diesel fuel price increases are somewhat greater than those for gasoline, because production of biodiesel is not large enough to affect the price of diesel imports. The report is available on the EIA web site <http://www.eia.doe.gov>.

QUESTION FROM REPRESENTATIVE UPTON

- Q2. Can you please tell the Committee what plans DOE is considering in the area of R&D to address the technical issues associated with ethanol and biodiesel on existing pipelines?
- A2. DOE is actively supporting DOT pipeline infrastructure efforts, which include studies of the feasibility of constructing new, dedicated ethanol pipelines and of transportation of ethanol through existing pipelines. DOE is not conducting R&D to address pipeline issues for biodiesel because current and projected volumes are relatively small compared to ethanol and do not necessitate moving the fuel through a dedicated pipeline. This support includes providing the Department's expertise on materials compatibility, supporting better ethanol transportation and safety standards, and working on the downstream infrastructure (terminals, dispensers, and vehicles).

QUESTION FROM REPRESENTATIVE UPTON

- Q3. Has the Department of Energy done any forecasting about projected inventory in petroleum refinery expansion? If so, could you describe that analysis? Also, has the Department of Energy considered the impact of a substantially expanded renewables fuels mandate on that analysis?
- A3. Although EERE has not done any forecasting, the Department of Energy's Energy Information Administration (EIA) annually projects refinery capacity as well as the production, import and consumption of liquid fuels such as motor gasoline, diesel, ethanol, and other feedstocks and products across a variety of energy price, macroeconomic growth, and other alternative cases. In the *Annual Energy Outlook 2007* reference case, domestic refinery capacity is projected to expand from 17 million barrels per day in 2005 to about 20 million barrels per day by 2030. Projected refinery expansion is inversely related to future oil prices, as illustrated by the low and high oil price cases that are also presented in the *Outlook*.

In addition, the EIA has recently completed a report, *Energy and Economic Impacts of Implementing Both a 25-Percent Renewable Portfolio Standard (RPS) and a 25-Percent Renewable Fuel Standard (RFS) by 2025*, which assessed the U.S. energy market impacts of implementing a 25 percent RFS simultaneously with the implementation of a 25 percent RPS. This analysis projects that implementation of such a policy in the reference case would reduce domestic refinery capacity to roughly 19 million barrels per day by 2030. The relatively modest impact on projected refinery capacity is explained by a combination of factors, including lower net petroleum product imports.

The results of EIA's analysis are directionally consistent with some recent discussion and debate in which the possibility of a significant expansion in the existing RFS has been

cited as one factor contributing to delays in companies' near- and mid-term plans to add refinery capacity.

QUESTION FROM REPRESENTATIVE UPTON

- Q4. Is our nation's transportation and delivery infrastructure capable of meeting a substantially increased renewable fuels mandate?
- A4. The Nation's current transportation and delivery infrastructure is not capable of meeting a substantial increase in the renewable fuels mandate and there are significant challenges to scaling-up the Nation's infrastructure capacity to accommodate increased use of renewable and alternative fuels (as called for in the President's Twenty-in-Ten plan). These challenges are significant, but manageable. The nature of the specific solutions will depend on the scope and on the specific requirements of such a mandate, and on the outcome of the pending energy and farm bills.

While our focus is on ethanol, some of the other renewable fuels, such as biodiesel, would have similar infrastructure issues to address. The challenges to increased use of ethanol are threefold: bulk transportation of ethanol, local storage and blending, and retail distribution. The Department of Transportation, in conjunction with the Association of Oil Pipe Lines, is taking the lead in addressing bulk transportation infrastructure issues--studying the feasibility of dedicated ethanol pipelines and the use of the existing pipeline delivery system, and addressing regional rail bottlenecks. The regional blend issue is both an economic and a policy issue because terminal capacity is becoming scarce. An Alternative Fuels Standard would provide a level of market certainty to ethanol blenders as they consider investment in new ethanol blending and storage

facilities. Economic incentives will play an important role as well. Companies will have an incentive to add blending capacity when transportation issues are resolved and if ethanol prices remain attractive for blending. Finally, given recent trends, we estimate that the current retail distribution capacity for E10 will be saturated within three years. The E85 volumes currently sold are less than 1% of the ethanol market, and there are not enough planned E85 pumps or flexible fuel vehicles to absorb a significant share of the upcoming ethanol production capacity increase. Therefore, the Department of Energy in partnership with other agencies has undertaken an accelerated testing program to investigate the feasibility of using intermediate blends (e.g. E20, E30) of ethanol in our transportation fleet and fuel distribution infrastructure.

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ONE HUNDRED TENTH CONGRESS

U.S. House of Representatives
Committee on Energy and Commerce
Washington, DC 20515-6115

JOHN D. DINGELL, MICHIGAN
CHAIRMAN

August 31, 2007

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Mr. Robert J. Meyers
Associate Assistant Administrator
Office of Air and Radiation
Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460

Dear Mr. Meyers:

Thank you for appearing before the Subcommittee on Energy and Air Quality on Tuesday, May 8, 2007, at the hearing entitled "Alternative Fuels: Current Status, Proposals for New Standards, and Related Infrastructure Issues." We appreciate the time and effort you gave as a witness before the subcommittee.

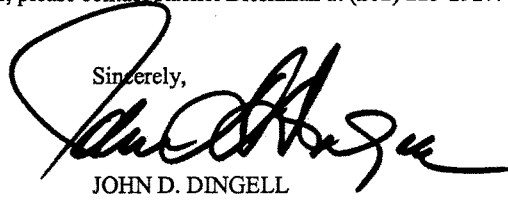
Under the Rules of the Committee on Energy and Commerce, the hearing record remains open to permit Members to submit additional questions to the witnesses. Attached are questions directed to you from certain Members of the Committee. In preparing your answers to these questions, please address your response to the Member who has submitted the questions and include the text of the Member's question along with your response.

To facilitate the printing of the hearing record, your responses to these questions should be received no later than the close of business on **Monday, September 17, 2007**. Your written responses should be delivered to **2125 Rayburn House Office Building** and faxed to **(202) 225-2899** to the attention of Rachel Bleshman. An electronic version of your response should also be sent by e-mail to Ms. Bleshman, at rachel.bleshman@mail.house.gov. Please send your response in a single Word formatted document.

Mr. Robert J. Meyers
Page 2

Thank you for your prompt attention to this request. If you need additional information or have other questions, please contact Rachel Bleshman at (202) 225-2927.

Sincerely,

A handwritten signature in black ink, appearing to read "John D. Dingell", written over the word "Sincerely,".

JOHN D. DINGELL
CHAIRMAN

Attachment

cc: The Honorable Joe Barton, Ranking Member
Committee on Energy and Commerce

The Honorable Rick Boucher, Chairman
Subcommittee on Energy and Air Quality

The Honorable J. Dennis Hastert, Ranking Member
Subcommittee on Energy and Air Quality

The Honorable Michael C. Burgess, Member
Subcommittee on Energy and Air Quality



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

SEP 27 2007

OFFICE OF
AIR AND RADIATION

The Honorable John Dingell
Chairman
Committee on Energy and Commerce
U.S. House of Representatives
Washington, D.C. 20515-6115

Dear Chairman Dingell:

Thank you for the opportunity to respond to a question for the record that followed the May 8, 2007, Energy and Air Quality Subcommittee hearing, "Alternative Fuels: Current Status, Proposals for New Standards, and Related Infrastructure Issues." Enclosed please find the response to the question you asked in your August 31, 2007, letter. I hope the information will be useful to you and the members of the Subcommittee.

Again, thank you for your letter. If you have any further questions, please contact me or your staff may contact Patricia E. Haman, in the Environmental Protection Agency's Office of Congressional and Intergovernmental Relations, at 202-564-2806.

Sincerely,

A handwritten signature in black ink, appearing to read "Robert J. Meyers".

Robert J. Meyers
Principal Deputy Assistant Administrator

Enclosure

Question for the Record from the May 8, 2007, hearing before the Energy and Air Quality Subcommittee, "Alternative Fuels: Current Status, Proposals for New Standards, and Related Infrastructure Issues"

Question from the Honorable Michael C. Burgess:

I understand that beginning in Model Year 2004, on-road diesel passenger cars must meet the same Tier 2 Bin 5 standard that gasoline passenger cars must meet for particulate matter, NO_x, etc.

Since diesel engines are on average thirty percent more efficient, aren't we getting more bang for our emissions buck when we use diesel?

Response from Robert J. Meyers, Principal Deputy Assistant Administrator, Office of Air and Radiation, U.S. Environmental Protection Agency:

It is true that the Tier 2 emission standards are "fuel neutral" and that diesel vehicles must meet the same standards as gasoline vehicles for non methane organic gases (NMOG), carbon monoxide (CO), oxides of nitrogen (NO_x), and particulate matter (PM). The Tier 2 standards are made up of eight different emission bins with unique standards for each bin and manufacturers are required to meet a corporate average for NO_x emissions equal to the bin 5 standard.

Diesel engines are more efficient than gasoline engines on an energy basis, however because the Tier 2 standards are "fuel neutral" and the emissions are measured on a grams per mile basis, energy efficiency does not necessarily translate to lower emissions for NO_x and particulate matter. The energy efficiency of a diesel engine will, however, translate into less CO₂ emissions per mile compared to a comparable gasoline engine.