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WHAT'S COOKING WITH GAS: THE ROLE OF NATURAL GAS IN ENERGY INDEPENDENCE AND GLOBAL WARMING SOLUTIONS

HEARING

BEFORE THE

SELECT COMMITTEE ON
ENERGY INDEPENDENCE
AND GLOBAL WARMING
HOUSE OF REPRESENTATIVES

ONE HUNDRED TENTH CONGRESS

SECOND SESSION

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HEARING ON WHAT'S COOKING WITH GAS: THE ROLE OF NATURAL GAS IN ENERGY INDEPENDENCE AND GLOBAL WARMING SOLUTIONS

WEDNESDAY, JULY 30, 2008

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

The committee met, pursuant to call, at 1:28 p.m., in Room B–318, Rayburn House Office Building, Hon. Edward Markey [chairman of the committee] presiding.

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

Staff present: Ana Unruh Cohen.

The CHAIRMAN [presiding]. Welcome to the Select Committee on Energy Independence and Global Warming. We have a very important hearing today that I think is going to illuminate an issue that has not really been discussed as fully as it should in our country.

Natural gas has been called the prince of fossil fuels, and with good reason. It is cleaner burning and emits half the carbon dioxide of coal and one-third the amount of oil. Natural gas supplies a quarter of U.S. energy needs. It is a crucial component in many aspects of the U.S. economy, from home heating to electricity generation to transportation fuel, to a feedstock for the chemical industry for everything from fertilizer to pharmaceuticals.

Over the last decade, the price of natural gas has increased dramatically, leaving consumers with bills that require a king's ransom to pay. Despite the recent dip, natural gas prices remain two- to three-times higher than they were at the beginning of this decade. It would be hard to imagine on a hot July day, but winter will be here soon and many of our most vulnerable families will struggle to pay their heating bills.

High prices have allowed the extraction of natural gas, using more expensive drilling techniques and spurred new exploration and the discovery of significant new on-shore resources. If developed in an environmentally responsible way, U.S. natural gas production could increase substantially. But we must not forget that natural gas, like all fossil fuels, is both a finite resource and a contributor to greenhouse gases. Because of that reality, we must use it wisely in a targeted manner, and we must use it efficiently and

in ways that help transform our economy to one that is more energy secure and climate friendly.

Today, our witnesses will discuss a number of natural gas uses that are already helping to achieve those goals, and what might be possible in the near future. For example, the chemical industry produces composites that make our cars stronger and more fuel efficient, and insulation that reduces energy use in buildings. Natural gas is helping to supply cleaner electricity to dense urban areas and expands the use of renewable technologies by providing electricity when the wind isn't blowing or the sun isn't shining.

New highly efficient micro-combined heat and power systems will allow homeowners to generate electricity and heat their homes while barely increasing their usage of natural gas. Natural gas vehicles are already displacing gasoline and diesel and improving air quality. The replacement of diesel fleets such as buses and trucks with natural gas-powered vehicles has especially helped reduce dangerous air pollution in some of our most polluted cities. Fuel-cell vehicles hold the promise of using natural gas more efficiently in the transportation sector.

As Congress considers energy policies that will increase our energy independence and help solve global warming, understanding the role of natural gas is critical. The testimony of our witnesses today should help us understand what policies are necessary to best deploy this precious natural resource.

That completes the opening statement of the chair, and I will turn to recognize the ranking member of the committee, the gentleman from Wisconsin, Mr. Sensenbrenner.

[The prepared statement of Mr. Markey follows:]

THE SELECT COMMITTEE ON
ENERGY INDEPENDENCE AND GLOBAL WARMING

OPENING STATEMENT OF CHAIRMAN MARKEY

Hearing on "What's Cooking with Gas: the Role of Natural Gas in Energy Independence and Global Warming Solutions"

July 30, 2008

Natural gas has been called the "prince of fossil fuels" and with good reason. It is cleaner burning and emits half the carbon dioxide of coal and one-third the amount of oil. Natural gas supplies a quarter of U.S. energy needs. It is a crucial component in many aspects of the U.S. economy from home heating, to electricity generation, to transportation fuel, to a feedstock for the chemical industry for everything from fertilizer to pharmaceuticals.

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But we must not forget that natural gas, like all fossil fuels, is both a finite resource and a contributor to greenhouse gases. Because of that reality, we must use it wisely, in a targeted manner, and we must use it efficiently and in ways that help transform our economy to one that is more energy secure and climate friendly. Today our witnesses will discuss a number of natural gas uses that are already helping to achieve these goals and what might be possible in the near future.

For example, the chemical industry produces composites that make our cars stronger and more fuel-efficient and insulation that reduces energy use in buildings.

Natural gas is helping to supply cleaner electricity to dense urban areas and expand the use of renewable technologies by providing electricity when the wind isn't blowing or the sun isn't shining. New highly efficient micro-combined-heat-and-power systems will allow homeowners to generate electricity and heat their homes while barely increasing their usage of natural gas.

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especially helped reduce dangerous air pollution in some of our most polluted cities. Fuel cell vehicles hold the promise of using natural gas more efficiently in the transportation sector.

As Congress considers energy policies that will increase our energy independence and help solve global warming, understanding the role of natural gas is critical. The testimony of our witnesses today should help us understand what policies are necessary to best deploy this precious natural resource.

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

Natural gas is one of the most versatile and useful fuel sources in the world. It fires power plants, heats homes, and is a feedstock for many fertilizers and pharmaceutical products, and it can be used as an automotive fuel. Not only that, natural gas is one of the cleanest-burning fossil fuels there is. It produces much less CO_2 than coal or oil and almost negligible amounts of nitrogen oxide and sulfur dioxide.

Our country needs more of this useful fuel. In fact, there is plenty of it out there for us to use. The United States uses about 23 trillion cubic feet of natural gas a year and the Interior Department's Mineral Management Service believes that there may be as much as 420 trillion cubic feet of natural gas on the outer continental shelf. Unfortunately, 85 percent of this potential natural gas bonanza is off-limits to production right now, thanks to a congressional moratorium on exploration.

But the congressional moratorium on natural gas doesn't just stretch to offshore exploration. The testimony of Marc Smith of the Independent Petroleum Association of the Mountain States, shows that of the 279 million acres of federal land that have oil and natural gas potential, 145 million of these acres are closed to leasing. Many of those acres are in the natural gas-rich intermountain west.

It is not just the cost of gasoline that is skyrocketing. People are starting to feel the pinch of higher natural gas prices as well. The Energy Information Administration projects that the average cost of natural gas for home heating will rise by more than 40 percent this winter. That is an average of $364 per home and for most people that is not chump change.

And these high costs are having a profound effect on industry, too. The testimony of Rich Wells of the Dow Chemical Company shows that Dow's expenses for natural gas have quadrupled since 2002. With these skyrocketing energy costs, it is a wonder more manufacturers like Dow aren't taking their operations overseas. And did I mention that natural gas is cheaper in China and India?

The Democratic governor of Pennsylvania, Ed Rendell, understands the value of natural gas. His state uses more than 500 billion cubic feet a year, nearly half of which is for residential uses. Just this April, Governor Rendell opened up 75,000 additional acres of state forest for natural gas exploration, while acknowledging the need for cleaner-burning fuels and increased energy independence. If the Democratic governor of Pennsylvania can do it, why can't Congress?

Republicans are for increasing our domestic energy supplies across the board. We call it our all-of-the-above energy strategy. And yes, that includes renewables like solar and wind power, but as Mr. Smith notes in his testimony, natural gas will have to serve as the backup power source for these renewable energy sources because sometimes the wind doesn't blow and sometimes it is cloudy or even snowy where I come from.

From the testimony today, I think it will be clear to everyone how valuable natural gas will be to our economy and our energy security. I think it will be clear to everyone that increasing our do-

mestic supply of natural gas will help improve our economy, as well as our environment.

What won't be clear is why the House Democratic leadership is blocking a vote on opening these offshore areas for production of this vital natural resource. It sure isn't clear to me, and I am sure it isn't clear when many people get their home heating bills this winter, and it won't be clear to them either. I urge Speaker Pelosi to let the House vote on this important issue today because the American people can't wait until tomorrow for relief from these high energy prices.

I thank the chair and yield back.

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

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

Mr. BLUMENAUER. Thank you, Mr. Chairman.

I, too, look forward to the conversation here. Natural gas is going to play a critical role. We are going to have again and again pointed out that it has less than half the greenhouse gas emissions of coal. It has flexibility. It can be, as my good friend from Wisconsin points out, a bridge. It is also going to be important that we capture some of the natural gas that is currently being flared off.

I hope that we are also able to focus on ways that we are going to be able to also do a better job of conserving the resource. I am pleased that we were able to advance an amendment earlier in this Congress to promote de-coupling, so that gas companies are not penalized for conservation. I would be interested if any of our witnesses have thoughts and observations about how we might further adjust the regulatory scheme so that they are actually rewarded for conserving—something that comes up periodically as we have had these conversations.

I look forward to an opportunity to explore this in greater length with our witnesses, and I will just sort of yield back at this point so we can get to it.

The CHAIRMAN. The gentleman's time has expired.

The chair recognizes the gentlelady from Tennessee, Mrs. Blackburn.

Mrs. BLACKBURN. Thank you, Mr. Chairman. I thank you for the hearing, and I want to welcome all of our witnesses. I want to thank you for submitting your testimony so that we had it in order to prepare for the hearing today.

I think we are all interested in what you have to say. I will say this, the chairman mentioned what a precious resource natural gas is. I think that we all realize that. But in order for Americans to benefit from that, it means it is going to require some action on behalf of Congress to enable companies to get to our natural resources, to actually be able to move that gas to the marketplace.

I think we have to realize that, and we know that that is what our constituents want to see happen. Take, for instance, Memphis. That is in my district in Tennessee. There was a 13.5 percent increase in the natural gas rates from MLGW last year. The prediction is that those could go up 30 percent more this year.

For families who are already feeling the pain at the pump or families who know that their home heating is going to increase as much as their electric power rates are increasing this summer, and

that their usage is going to change, doing nothing and not addressing the supply issues that we have is not something that they are willing to accept. They want to see some action. They want to see the supply problem solved. That means that we need to agree on how to best do that.

We all know the attributes of the product that you are going to talk about. We know that it is important to the portfolio of options that we have. We know that we as Republicans are supporting an all-of-the-above strategy. We welcome you and we are looking forward to hearing your remarks.

The CHAIRMAN. The gentlelady's time has expired.

The chair recognizes the gentlelady from California, Ms. Solis.

Ms. SOLIS. Thank you, Mr. Chairman. I appreciate having the hearing this afternoon, and also to thank our witnesses for being here.

We know that the U.S. is home to about 3.4 percent of the global reserves of natural gas, and I am pleased to note that about 2 percent of the proven technically recoverable natural gas reserves in the OCS are currently available for leasing and development. The multiple uses of natural gas as we know, however, pose an interesting alternative to oil. In the district I represent, there is a concerted effort to switch to cleaner-burning vehicles. I am happy that I was able to secure funding for one of my local cities who actually reconverted their buses to a natural gas system.

So I think the movement is happening more and more readily across the country. I am eager also to hear today about the efforts of Honda Corporation and hopefully other auto manufacturers will take their lead as well and begin to look at alternative vehicles that can be more useful and better proven for our economy, as well as for our environment.

We had a terrible earthquake yesterday in Los Angeles. It did affect my area. It was a 5.8 I believe. We are always worried about LNG facilities and safety factors and containment, so that is an issue that I personally have of concern. We have had our issues also with respect to the siting of a potential LNG facility out along the coast in Santa Barbara, I believe it was. Not Santa Barbara, actually one of the cities close to East Los Angeles where I represent.

Just a lot of issues regarding consulting the local communities and making sure that input is available where these sitings are going to be placed. I think it is a way that we have to realistically look at, but we also have to look at where we place these particular plants. In my case, we suffer from a large number of egregious projects that have been placed in a city that has been overburdened many times. We refer to it as an environmental justice playground for people because they site a lot of different sites there that are heavily contaminating. Of course, our community becomes concerned and affected.

Just with that, I just want to raise those questions and hopefully have some opportunity to talk to you about that. Thank you.

The CHAIRMAN. The gentlelady's time has expired.

The chair recognizes the gentleman from Oregon, Mr. Walden.

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

I want to welcome our panelists and guests today. Obviously, this issue of natural gas and its availability and affordability are paramount no the minds of those of us on this select committee, those of us on the Energy and Air Quality Committee, as well as our constituents. I know in the Northwest in Oregon, they have announced a residential rate increase of 35 percent to 40 percent for natural gas for this coming heating season.

So consumers who are feeling the shell-shock at the pump are going to feel it when they get their home heating bill this winter. And that is going to be yet another shock to the family budget and shock to the economy of our country. I already hear it when I go out in my 70,000-square-mile district and talk to farmers and ranchers who are paying double for their fertilizer costs, when you are seeing $5 diesel to run the vehicles.

This is a real problem in this country. This Congress has been an absolute failure when it comes to addressing access to energy, America's great reserve of energy. I am preparing to introduce legislation that will open up the outer continental shelf, give states new unprecedented authorities out to 12 miles, share the revenue back with those states, but also invest in renewable energy in a way that actually produces real revenue, not some mystical, magical offset or something where we come up every year and figure out how to extend like the production tax credit, but a real 10–year investment from the royalties in production of geothermal, wind, solar, and other alternative resources.

It also has a provision in there for conversion of gas guzzlers to natural gas in a match grant arrangement, as well as helping those on low incomes to be able to afford their home heating bills, and allow for full payment in our part of the world for county timber payments, which is a commitment the federal government has apparently given up on.

We can do that. We don't have to be mired the way we are today thinking America is going to be third-rate to some other country while we ship billions of dollars overseas to countries that hate us. It doesn't have to be that way. This Congress needs to act. We will have legislation to do that. I just hope that the majority will allow it.

Thank you, Mr. Chairman.

Mr. BLUMENAUER [presiding]. Thank you.

The gentlelady from South Dakota.

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

I thank our witnesses for being here today. I think this is a very important hearing. I represent the state of South Dakota, an agricultural district. Like Mr. Walden, I hear from the farmers I represent more than anyone else about the cost of natural gas and the need to increase supply because of the essential component of natural gas into nitrogen fertilizer.

So unlike those who may believe that farmers are reaping substantial profits given the price of commodities, when you look at the doubling of their fertilizer and fuel costs, they are demanding additional action to increase supply. It also makes me wary not only for them, but those of my constituents who through investor-owned utilities supply electricity with natural gas to those in some of our larger communities and our more rural ones as well, but

these proposals are seeking to propel an increased demand for natural gas before we really grapple with the supply issue.

So I am looking forward to hearing from the witnesses today and posing some questions, particularly as it relates to agricultural constituents, and not just fossil fuel and natural gas, but renewable natural gas. I think one of the witnesses will talk about it at greater length.

So Mr. Chairman, I thank you and yield back.

Mr. BLUMENAUER. The gentleman from New York, Mr. Hall.

Oh, I am sorry, John. The gentleman from Oklahoma.

Mr. SULLIVAN. Thank you, Mr. Chairman.

Thank you for holding this hearing on the important role that natural gas can play in helping our nation achieve energy security. If our nation is going to be serious about reducing the price of gasoline and lowering our dependence on foreign oil, then natural gas must be an important part of any comprehensive energy policy that Congress pursues.

In the first session of the 110th Congress, I introduced bipartisan legislation with Congressman Towns and Congressman Hall which reauthorizes the Department of Energy Natural Gas Research, Development, Demonstration and Deployment Program for an additional 5 years. I look forward to hearing testimony from all our witnesses, and especially Aubrey McClendon, chairman and CEO of Chesapeake Energy. Chesapeake Energy is located in my home state of Oklahoma and is the largest independent producer of natural gas in the United States.

Mr. McClendon also serves as the chairman of the American Clean Skies Foundation that just today announced a groundbreaking study about the supply of natural gas. It is my understanding that the study does not take into account areas that are currently in moratorium. I can only imagine the impact on supplies if we can successfully lift the moratorium on these areas in the west and off-shore.

I am glad that our committee will get to hear first-hand about these important findings, and I thank you and yield back the balance of my time.

Mr. BLUMENAUER. The gentleman from New York.

Mr. HALL. Thank you, Mr. Chairman.

Before I make my prepared remarks, I just wanted to say that contrary to some of the comments of some of my friends on the other side of the dais, I and other members of this caucus, the majority Democrats, are not against exploiting our resource. We are not against drilling. In fact, we voted for the Drill Act last week, which was unfortunately defeated largely through the opposition of the minority, which would have required oil companies to drill on the 68 million acres-plus that they already have leased and permitted and are ready to put the drill-bit in the ground, but for some reason they are not doing it.

So I just would like to lay that once again to rest. I am also for renewables. Thirty years ago, I co-founded a nonprofit that raised over $1 million and gave it away in small grants for solar, wind, geothermal and conservation and other alternatives. I only wish the government had been doing that for the last 30 years, or we wouldn't be where we are today, where the skyrocketing prices of

oil and gasoline have rightfully garnered a significant amount of attention and debate.

In which context, it would almost be understandable to call natural gas the forgotten fuel. This would be a drastic mistake and I am glad the committee is taking time to examine the issues surrounding the use and potential of natural gas. Natural gas tends to be cleaner-burning than oil and coal, and proportionately we have more of the world's gas resources than we do oil reserves.

It makes sense, then, that increasingly the choice for new power generation is natural gas. While natural gas does have advantages, it would be dangerous to delude ourselves into thinking it can be a cure-all for our energy crisis, because it is also an important feedstock for chemical production of fertilizer and a number of other uses. We have to be careful that we factor in the impact of increased demand on these commodities as we discuss how to best capitalize on our natural gas resources.

Likewise, we must make sure that as we contemplate developing natural gas resources, we fully understand and address the impacts of exploration. My district in the Hudson Valley of New York state is very close to areas that are considered part of the Marcellus shale gas reserve. Much of the discussion about exploring the reserve has centered on the method of hydrofracking, which could have severe water-use and environmental impacts.

I look forward to hearing the thoughts of our panel on how we can make the most effective and responsible use of our natural gas resources. I yield back.

The CHAIRMAN [presiding]. The gentleman's time has expired.

The gentleman from Missouri, Mr. Cleaver, is recognized.

Mr. CLEAVER. Thank you, Mr. Chairman.

I would like to associate myself with the comments of my colleague, Mr. Hall, the preface he made before his comments about natural gas.

I would also like to welcome our distinguished guests. We appreciate your presence here today.

Natural gas is cleaner, and I had to do this argument last night with a group of people pushing something else, but it is much cleaner than coal. It releases about half the carbon emissions of coal, and it has the potential of becoming a viable replacement for coal to heat and cool homes, and to power vehicles.

I am always fascinated by and have much appreciation for the buses that move up and down the streets of the District of Columbia. They have the lettering on the side that this bus is powered by clean natural gas. I have also made attempts to get our area transportation authority interested in trying to get more buses that are fueled by natural gas in Kansas City, Missouri.

The collection of natural gas is an invasive process and increased demand could encourage calls for drilling in protected areas. Additionally, natural gas is a limited and finite resource. The supply that exists within our borders today will last only until it is all gone. After all the natural gas is utilized by our homes and our vehicles, we will still have to find a new source of energy.

So I think realistically we need to look at natural gas as a temporary solution and to leave such a fate to future generations is a morally bankrupt thought. I think it is our responsibility now to

have the vision to do those things that will enable future generations and even their progeny to inherit a cleaner planet.

So I look forward to hearing what our witnesses have to say about this critical issue and what the future of natural gas is for our country.

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

[The prepared statement of Mr. Cleaver follows:]

U.S. Representative Emanuel Cleaver, II
5th District, Missouri
Statement for the Record
House Select Committee on Energy Independence and Global Warming Hearing
"What's Cooking with Gas: the Role of Natural Gas in Energy Independence and Global Warming Solutions"
Wednesday, July 30, 2008

Chairman Markey, Ranking Member Sensenbrenner, other Members of the Select Committee, good afternoon. I would like to welcome our distinguished panel of witnesses to the hearing today.

Natural gas is cleaner than coal since it releases half the carbon emissions, and it has the potential to become a viable replacement for coal to heat and cool homes and to power vehicles. There are already buses powered by natural gas in Washington DC, which are helping to reduce emissions in the high-traffic District. Currently the transportation sector accounts for less than one percent of natural gas consumption, but natural gas powered vehicles are still making an impact to reduce greenhouse gas emissions.

However, the collection of natural gas is an invasive process, and increased demand could encourage calls for drilling in protected areas. Additionally, natural gas is a limited and finite resource. The supply that exists within our borders today will only last until it is gone. After all the natural gas is utilized by our homes and our vehicles, we will have to find a new energy resource, so this is realistically only a temporary solution. To leave such a fate to future generations is a morally bankrupt thought, nor is it fair. We must find a solution that will be viable for dozens of future generations, but natural gas could be way to help us to the next step in that process. I look forward to hearing what our witnesses have to say about this critical issue, and what the future of natural gas is for our country.

I thank all of our witnesses for their insight and suggestions, and I appreciate them taking the time to visit with our committee today.

Thank you.

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

Now, we will turn to our panel and recognize our first witness, Mr. Aubrey McClendon. He is cofounder and serves as chairman of the board and CEO of Chesapeake Energy Corporation. Chesapeake Energy is the largest independent producer of natural gas and is responsible for 4 percent of domestic natural gas production.

We welcome you, Mr. McClendon. Whenever you are ready, please begin.

STATEMENTS OF MR. AUBREY McCLENDON, CEO, CHESAPEAKE ENERGY, OKLAHOMA CITY, OKLAHOMA; MR. MARC SMITH, EXECUTIVE DIRECTOR, INDEPENDENT PETROLEUM ASSOCIATION OF MOUNTAIN STATES, DENVER, COLORADO; MR. CLAY HARRIS, CEO, SUEZ LNG NORTH AMERICA, HOUSTON, TEXAS; MR. DAVID MANNING, EXECUTIVE VICE PRESIDENT, NATIONAL GRID, WASHINGTON, DC.; MR. RICH WELLS, VICE PRESIDENT ENERGY, THE DOW CHEMICAL COMPANY, MIDLAND, MICHIGAN; MR. JOHN GERMAN, MANAGER, ENVIRONMENTAL AND ENERGY ANALYSIS, AMERICAN HONDA, WASHINGTON, DC.

STATEMENT OF AUBREY McCLENDON

Mr. McCLENDON. Thank you, sir.

Thank you, Mr. Chairman and members of the committee for the opportunity to discuss the great promise of natural gas in the United States. I am Robert McClendon, CEO of Chesapeake Energy and also chairman of the American Clean Skies Foundation.

Today, we issued a groundbreaking new study which proves that America's natural gas resources will last for at least the next 100 years. We are a public company founded in 1989. We do produce 4 percent of America's natural gas. We drill 9 percent of America's new natural gas wells. In 2008, we will invest $10 billion to develop new reserves of natural gas right here in America.

If there is one message I would like to effectively communicate today it is that America is at the beginning of a great natural gas boom. This boom can largely solve our present energy crisis. The domestic gas industry through new technology has found enough natural gas right here in America to heat homes, generate electricity, make chemicals, plastics and fertilizers, and most importantly, potentially fuel millions of cars and trucks for decades to come.

This great new period of discovery in our industry has largely gone unnoticed by the media and most policymakers. Our industry has recently learned how to extract natural gas from massive rock formations called gas shales buried deep below the earth's surface.

For example, just a month ago Chesapeake announced a new area in Louisiana and Texas called the Haynesville shale, which was featured 2 days ago on the front page of the New York Times, that we believe will become the nation's largest gas field and the fourth largest gas field in the world. In just the past month since we made that announcement, natural gas prices have declined by about 35 percent. Just by itself, we believe this one field has enough gas to meet the country's gas needs for 20 years.

I believe natural gas can be the driving force for how Congress can take bold action to free our country from the death grip of high prices for imported oil, thereby improving our economy, enhancing national security, and helping the environment. How might Congress lead us to that freedom? It is actually very easy. All you have to do is provide incentives for gasoline station owners to add a CNG pump, provide incentives for homeowners with natural gas already piped into their homes to add a home refueling device, provide incentives for manufacturers to make cars and trucks that run on CNG, and finally provide American consumers with incentives to buy new CNG vehicles or retrofit their existing vehicles to CNG.

Why should you provide incentives to switch to CNG? It is simple. Nothing less than the survival of the American way of life is at stake. Oil production around the world has stagnated, while demand in developing countries is rising rapidly. The result is that the days of cheap oil are over and America has been left holding the bag, a bag into which we put $700 billion each year of our national wealth and export it to various countries around the world. We are on the road to national bankruptcy and we must change our ways.

The good news is it is easy to do. We don't need a new fuel. We don't need new technology, and we don't need hundreds of billions of dollars. All you have to do is modify or replace today's gasoline and diesel engines with engines that run on CNG. That is natural gas that costs half the price of gasoline, is more than two-thirds cleaner, is made in America and we have plenty of it.

Imagine tomorrow if you could announce a new energy plan that would in one stroke cut your constituents' gasoline bills in half, reduce our oil imports, improve our air quality, enhance national security, strengthen the dollar, reduce greenhouse gas emissions, and create tens of thousands of new jobs in the U.S. I believe your upcoming reelection chances would be even higher than they already are if that were possible. [Laughter.]

In closing, I would like to offer my 100 percent support to Representative Sullivan's bill, as well as the Emanuel-Boren New Alternative Transportation to Give America Solutions Act, or more simply, the NATGAS Act which was introduced on July 22, that would start us down the road of freedom from foreign oil. I urge each of you to become a cosponsor of this legislation and lead America out of our energy wilderness into a brighter future fueled by clean, affordable, abundant American natural gas.

Thank you.

[The statement of Mr. McClendon follows:]

Written Testimony of Aubrey K. McClendon, Chairman and CEO of Chesapeake Energy Corporation and Chairman of the American Clean Skies Foundation, before The Select Committee on Energy Independence & Global Warming - July 30, 2008

Thank you Mr. Chairman and Members of the Committee for the opportunity to discuss the great promise of natural gas in the U.S. I am Aubrey McClendon, Chairman and CEO of Chesapeake Energy Corporation, located in Oklahoma City and the most active driller and the largest independent producer of natural gas in the U.S. I am also Chairman of the American Clean Skies Foundation here in Washington, which today has issued a groundbreaking new study that proves America's natural gas resources are likely to last for at least the next 100 years.

To give you some background on the company I co-founded in 1989, Chesapeake is a public company listed on the New York Stock Exchange. We produce about 4% of America's natural gas and drill roughly 9% of all the new gas wells in the U.S. We will earn approximately $2 billion in profits this year, but we will invest approximately $10 billion to look for and develop new reserves of natural gas in the U.S. To put that in perspective, the biggest major oil company is roughly 20 times larger than Chesapeake, but worldwide they will only spend about 3 times more than we will on new projects, with little of those expenditures actually spent in the U.S. I provide this information to you so that as you look around and want to blame someone for high energy prices, don't blame Chesapeake or me!

Next, I would like to tell you more about the natural gas industry in the U.S. Many of you may think of our industry as being part of the "oil and gas industry" and therefore attached at the hip to the oil industry. However, nothing could be further from the truth. Here's why: the U.S. today consumes about 63 billion cubic feet of natural gas per day - in energy BTU equivalency terms, that's 10.5 million barrels of oil per day, or about half of the amount of oil that the U.S. consumes each day.

Of that 63 bcf per day of natural gas consumption, we import about 1 bcf in the form of liquefied natural gas, or LNG, and we import about 8 bcf per day from Canada. This means that we are about 98.5% self-reliant on natural gas supply from North America and about 86% self-reliant on natural gas supply from the U.S. Contrast that with oil,

where we are only about 45% North American self-reliant and only about 33% self-reliant from U.S. sources.

Next, I'd like to tell you about who produces natural gas in the U.S. First of all, we are a highly fragmented industry with more than 10,000 American-based companies producing natural gas from 22 different states. Most producers are very small private businesses that may drill a well or two per year. The heavy lifting in the industry is performed by the 20 largest U.S. natural gas producers, which account for about 60% of all U.S. natural gas production. Of these 20 companies, 6 are integrated oil companies with household names, such as Exxon or Chevron, while 14 are much smaller public companies such as Chesapeake, and we are, of course, hardly household names.

We are very different companies from the major oil companies - they are vast, vertically integrated, worldwide enterprises worth hundreds of billions of dollars. And they are properly taking on huge oil and natural gas projects around the world that are too big, too risky and too time consuming for smaller companies such as Chesapeake. Instead, we are what is called an "independent" producer. We have been called that historically because independents were not affiliated with major oil companies back in the days of the Standard Oil Trust.

The independent producers are the heroes of the American natural gas industry. We re-invest way more than we make and take on big financial and operating risks to find significant new reserves of clean-burning natural gas in the U.S. Our industry's success is why American natural gas consumers are today enjoying natural gas prices that are the lowest in the industrialized world and less than half of the price of oil on an energy equivalency basis.

This brings me to why I am here today. I believe natural gas can and should be the driving force for how this Congress can take bold action to free our country from the death grip of high prices for imported oil, thereby improving our economy, enhancing national security and helping the environment. It's a trifecta, triple play and hat trick all rolled into one.

How might you gain us that freedom? It's actually very easy. All you have to do is properly encourage the substitution of natural gas in its compressed form, called "CNG", for gasoline and diesel in government, post office and military vehicle fleets, provide incentives for gasoline station owners to add a CNG pump to their highest volume stations, provide incentives for homeowners with natural gas already piped into their homes to add a home refueling device in their garage, to provide

incentives for auto and truck manufacturers to make cars and trucks that run on CNG and finally, to provide American consumers with incentives to buy new CNG cars and trucks and to retrofit their existing vehicles to CNG.

In addition, you can provide the same incentives for light, medium and heavy duty trucks as well to reduce the demand for diesel. By the way, GM, Ford and Chrysler in the U.S. no longer make any CNG cars, but they for sure know how. GM, for example, builds 18 models of CNG-fueled cars and trucks in countries around the world, why is that? Because they are required to or are incentivized to do so, just as they can be in the U.S. through your leadership. For example, 24%, a total of 1,650,000 of cars in Argentina are fueled by CNG and around the world there are approximately 8 million CNG-fueled cars, or about 1% of the global total. I might add Honda sells the only factory made CNG car in America, the Civic GX – Chesapeake owns one and it gets [20] miles per gallon and we refuel it every week at $[1.00] per gallon, or about $10. We have ordered another 100 more!

OK, so why should you provide these incentives to switch to CNG? It's simple – nothing less than the survival of the American way of life is at stake. Oil production around the globe has stagnated while demand in developing countries is increasing rapidly and the result is the days of cheap oil have ended and America has been left holding the bag – a bag into which we put $700 billion per year of our national wealth and export it to various countries around the world, many of them with agendas and ways of life very different and often even threatening to ours. And despite all the recent commotion over speculation in the oil market, the reality is oil prices have been rising for 10 years for a very good reason – demand growth is outstripping supply growth – and, in all likelihood, they will continue to rise in the future. We are on the road to national bankruptcy and must change our ways.

The good news is it's easy to change – we don't need a new fuel, we don't need new battery technology, we don't need hundreds of billions of dollars. All you have to do is modify or replace today's internal combustion engines that run on gasoline and diesel and replace them with an internal combustion engine that runs on natural gas. And that's America's own natural gas that costs less than half the price of gasoline, is more than two-thirds cleaner, and best of all produced right here at home in America, and we are proving to skeptics everyday that there is plenty of it.

Imagine tomorrow if your hometown or national newspaper proclaimed that you had introduced a plan that would, in one stroke, cut gasoline

bill's in half, reduce our oil imports, improve our air quality, enhance national security, strengthen the dollar, reduce greenhouse gas emissions and create tens of thousands of new jobs in the U.S. in the automotive, truck, steel, natural gas and related industries. You'd be local and national heroes, you would have changed the course of American history and your opponents would likely drop out of your re-election campaign this fall – well, maybe the first two anyway!

But seriously, imagine the headlines and gratitude you would receive. So is there enough natural gas to do this? The answer is absolutely yes. To convert just 10% of American cars to CNG would take less than 8 years to do and would only require an increase in U.S. natural gas consumption of slightly over 1% per year Yet, this year alone American natural gas producers will increase U.S. natural gas supplies by about 9%. Going forward, I believe U.S. natural gas producers can increase supplies by 5% per year for at least the next decade and that assumes there is no more access to public lands and waters than there is today.

So that means there's plenty of natural gas to burn to make electricity, plenty of natural gas to heat our homes and to make chemicals and plastics and there's plenty of natural gas available to begin the conversion of our transportation fleet from dirty, expensive, imported oil to clean-burning, affordable, abundant, American natural gas.

In closing, I will leave with you a PowerPoint summary of a groundbreaking new study released today by Navigant Consulting and the American Clean Skies Foundation. It provides clear and convincing independent verification of the supply gain projections I have just mentioned. In addition, I would like to offer strong support for Congressmen Emanuel and Boren's, New Alternative Transportation to Give Americans Solutions Act, as well as Congressman Sullivan's 2007 bill HB2877, both of which would start us down the road towards freedom from foreign oil. I urge each of you to consider becoming a co-sponsor of this legislation and lead America out of our energy wilderness into a brighter future fueled by clean, affordable, abundant, American natural gas! Thank you.

Appendix:

The Case for Natural Gas: Not all BTU's are created equally: natural gas is a superior product to coal or OPEC oil. Natural gas is the most practical near term solution to the world's dual challenges of generating more energy and producing less pollution. Natural gas can and should begin backing out gasoline and diesel usage in the transportation sector: it's cheaper, cleaner and made in the U.S.

Natural gas, conservation and energy efficiency and nuclear power is what the world needs to reduce world oil prices and greenhouse gas emissions.

Natural gas is clean: Drilling for natural gas leaves a small footprint; pad drilling, for example, which allows multiple wells to be drilled directionally from one surface location is a new innovation that reduces surface impact and as a vehicle fuel, natural gas has 30% less CO2 emissions and emits 90% less pollution than gasoline. A modern combined-cycle natural gas power plant is second only to a nuclear power plant as the cleanest source of electrical generation. This is especially true when natural gas power is paired with renewables like wind and solar. Natural gas undergirds these renewables when the wind doesn't blow or the sun doesn't shine.

Natural gas is affordable: Natural gas costs are roughly 50% of the BTU equivalent price of oil. Imagine the demand for cars and trucks that could run on a clean-burning American fuel that costs $2 per gallon!

Natural gas is American: Do you want to reduce OPEC's financial stranglehold on us, reduce the U.S. trade deficit and enhance national security? It's simple: use American-produced natural gas instead of foreign oil in the transportation sector. More than 98.5% of the natural gas we use in America is produced in North America and distributed through a highly integrated pipeline network that delivers natural gas every day to 64 million American homes and businesses. Furthermore, the benefits of using natural gas would be broadly distributed among the states – 32 sates produce natural gas, compared to only 26 that produce coal.

Natural gas is abundant: In 2008 so far, U.S. natural gas production is up 8% from a year ago. And just today, the American Clean Skies Foundation and Navigant Consulting Inc., released a new study that demonstrates U.S. natural gas reserves exceed 2.2 quadrillion cubic feet, enough to last more than 100 years.

ACSF commissioned this study earlier this year to determine the long-term viability of natural gas as the answer to reducing oil's stranglehold on the American economy. Existing forecasts from both government and private sources did not appear to accurately capture the contribution and potential of new natural gas supplies, particularly gas from shale formations. Navigant developed a comprehensive assessment of North American natural gas supply with their researchers analyzing production and reserve data from existing sources including previous gas supply studies, state agencies, other

public data, and through direct outreach to more than 60 large natural gas producers. Researchers then compared this information with current models, including models produced by the DOE's Energy Information Agency. Here are the highlights:

- U.S. natural gas production has been increasing at a fast and steady rate. U.S. production has increased from 2005 to now at a compound annual growth rate of 6 percent per year.
- In April 2008, production from U.S. onshore sources exceeded the flows from onshore and offshore sources during the first half of 2005 before hurricanes massively disrupted U.S. natural gas production. Today, our natural gas assets are safer and more widely distributed and not subject anymore to catastrophic hurricane damage.
- Why is natural gas production growing so quickly? Because the development of two types of onshore natural gas supplies - shale gas and tight sands gas - has increased at a pace that has far exceeded the expectations of the government or the industry. We call these new plays "unconventional," because they are different rocks than we have produced from for the last 100 years in our industry. However, today these unconventional supply sources have become the foundation of American natural gas supply and will provide 100% of the growth in gas supply in the decades ahead.
- The Navigant study focused on the biggest and fastest growing of these sources, shale gas. Here, supply has been growing exponentially as major new resources have been discovered and developed in the past few years. Production from these shales with names such as the Barnett, Haynesville, Fayetteville, Woodford and Marcellus - has increased from 1% of supply 10 years ago to almost 10% of supply today.
- The Navigant study demonstrates that by 2018, shale gas alone will add enough new gas supply that we can accommodate the use of natural gas to displace 20% of all U.S. vehicle fuel with natural gas and to avoid ever having to build another coal-fired power plant.
- How sustainable is this supply growth? The resource base supporting it is huge - originally estimated by the Potential Gas Committee and EIA in 2006 as 1.5 quadrillion cubic feet - about 80 years' worth at then-current production levels. But the new Navigant study demonstrates that it's almost 50% bigger -

approximately 2.2 quadrillion cubic feet. That's almost 120 years' worth at last year's production levels.

- The coal industry frequently refers to the U.S. as the "Saudi Arabia of coal." The truth is U.S. coal production has been stagnant for years while U.S. gas production is now soaring, and more properly now, the U.S. should be referred to as the "Saudi Arabia of natural gas." And in all likelihood, that is a further misnomer as it is highly unlikely that Saudi Arabia can maintain it's present oil production levels for more than another 15 years, much less 120 years.
- The shale gas resource was always there - what has changed is that improved technology and the very aggressive financial commitments U.S. independent natural gas producers have made to unlock its potential.

The new bottom line: There is no reason to conclude that the U.S. does not have natural gas resource base to support growth in existing gas uses as well as take on at least 20% of the fuel used to power the U.S. transportation grid.

CNG is the Answer to High Prices and Lower Emissions:

Natural gas is half the price of gasoline: CNG sells for approximately $2.00 per gallon, compared to over $4.00 per gallon for gasoline and diesel.

Reducing demand for gasoline will reduce oil prices: Every 10% of U.S. cars converted to CNG would lower oil consumption by one million barrels per day, reducing our oil import bill by more than $120 million per day.

Natural gas is clean and reliable: In cars, CNG reduces COC's by more than 67% and greenhouse gas emissions by 30%. CNG engines have been manufactured for several decades – in fact, today Honda produces an assembly line CNG vehicle in Marysville, Ohio today, the Civic GX and GM and Ford produce CNG vehicles around the world and have produced CNG vehicles in the U.S. within the last 5 years. Clearly automakers in America have the technology to produce vehicles that run on natural gas – all they need is the assurance that their customers will be able to easily refuel them. In contrast, GM makes four different CNG vehicles in Europe and Asia and over 8 million natural gas vehicles are in use worldwide today, but only about 2% of those are in the U.S. However, natural gas is gaining market share in U.S. fleet vehicles. In 2006, 15% of U.S. transit buses were powered

by natural gas and in 2009, Kenworth plans to introduce the first commercial heavy truck that will run on natural gas. By [2010], the Ports of Los Angeles and Long Beach will have switched all of their truck traffic from diesel power to CNG power. The market is reacting to the value of CNG, but it needs a governmental boost to move more quickly.

The world has seen the promise of CNG faster than we have: In the European Community, for example, a directive exists that mandates the usage of natural gas for transportation fuel at levels of 2% by 2010, 5% by 2015 and 10% by 2020. Europeans are already making significant progress towards achieving these mandated levels – for example, Italy already has over 400,000 natural gas vehicles on the road. In South America, significant progress is also being made – 33% of Argentina's cars now run on CNG and other countries are moving towards CNG as well. The U.S. has greater natural gas resources than any other large country except Russia and we should quickly move to take advantage of the vast abundance – we have a significant energy advantage over all other industrialized nations and we should use this to our economic and environmental advantage.

However, the CNG refueling infrastructure needs to be built and that's where the Emanuel/Boren NAT GAS Act provides the boost:

The quickest, cheapest and most American solution to breaking foreign oil's stranglehold on the American economy is to convert at least 10% of our vehicles to natural gas in the next 10 years. However, today we have a chicken-and-egg problem. Until the CNG refueling infrastructure is in place, automakers won't make the cars and consumers won't demand the cars - the crucial problem to solve is refueling infrastructure. But with proper incentives, CNG refueling infrastructure can be put in place quickly since most existing gasoline stations and over 70% of homes have a natural gas pipeline running to them. CNG fueling units that are UL rated appliances (such as the PHILL unit brand) can be installed readily in the garages of most U.S. residences – many Americans may never have to visit a gasoline station again!

Bold action in favor of American CNG is critically needed. The **NAT GAS Act** (H.R. 6570) introduced by Congressmen Rahm Emanuel (D – IL) and Dan Boren (D – OK) last week would encourage such bold action. Emanuel and Boren's legislation would provide incentives to encourage automakers to make 10% of their fleet vehicles run on

natural gas by2018. The bill would also offer new incentives to make CNG more readily available for drivers and could enable the construction of natural gas pumps at 20,000 gas stations across the country. In summary, the legislation:

- Offers a $90,000 tax credit to encourage gas station owners to install natural gas fuel pumps.
- Provides $2.6 billion in bonding authority to states to provide no or low-interest loans to service stations to install natural gas pumps.
- Requires the gas stations owned by the major oil companies to install at least one natural gas pump in each station by 2018.
- Includes an increase from 50% to 100% on consumer tax credits ($5,000 for vehicles weighing 8500 lbs. or less) for the purchase of natural gas vehicles.
- Provides consumer tax credits of up to $2,000 for Americans to purchase a home CNG refueling unit, a simple device that can be installed in a garage that allows drivers to use their home natural gas line to refuel their car.
- Creates a production tax credit of up to $2,000 per car to encourage car companies to manufacture natural gas vehicles in the United States.
- Provides up to $5 billion in bonding authority to producers of NGV's to encourage the re-tooling of U.S. manufacturing facilities to produce natural gas vehicles.

This bill needs your support!

Finally, in making decisions about energy policy, please ensure that no new barriers are placed in the way of natural gas being an important part of a more sustainable U.S. energy future. That means in going after speculators, don't inadvertently harm producers that need liquid futures trading markets and abundant counterparties to reduce risk. That means be careful with carbon reduction initiatives to not inadvertently impose a regulatory burden on carbon-light natural gas while addressing carbon-heavy fuels such as oil and coal. And finally, when it comes to taxation policy, any additional money taken from independent natural gas producers will reduce the supply of natural again the U.S. and further complicate our energy challenges.

The CHAIRMAN. Thank you, Mr. McClendon, and thank you so much for dramatically increasing the likelihood of the reelection of Mr. Sullivan. We appreciate that. [Laughter.]

Let me now turn to recognize our second witness, Marc Smith, the executive director of the Independent Petroleum Association of Mountain States, a nonprofit trade association responsible for oil and natural gas development in the intermountain west. Mr. Smith has also worked in research for teacher planning and government affairs.

We welcome you, Mr. Smith.

STATEMENT OF MARC SMITH

Mr. SMITH. Mr. Chairman, members of the committee, thank you for the opportunity to appear before you today. This is a very important and timely hearing.

I am here today on behalf of the Independent Petroleum Association of Mountain States, a nonprofit, nonpartisan organization representing more than 400 independent oil and natural gas producers and related companies committed to environmentally responsible oil and natural gas development.

Armed with new technologies and a new generation of high-tech savvy employees, America's independents are producing energy from complex reservoirs that were thought to be uneconomic just 10 years ago. This Congress could help put America on a path to greater energy independence and a sustainable energy future by lifting restrictions on OCS drilling and addressing the barriers that are limiting development of new supplies of oil and natural gas in the intermountain west.

As the cleanest-burning fossil fuel, natural gas will also play an increasingly important role in a carbon-constrained world as an essential part of any plan to reduce greenhouse gas emissions. If we increase demand for natural gas, we need to have corresponding policies to plan for the development of new supplies. Natural gas producers don't need special subsidies. They need access to the places where energy resources are found and a predictable regulatory and tax structure in order to make long-term investment decisions that ensure uninterrupted supply.

Some of the most promising areas for future development of natural gas are the outer continental shelf and the on-shore federal lands in the intermountain west. In total, 279 million acres of federal land have oil and natural gas potential. Of these acres, 145 million are close to leasing and another 20 million are inaccessible because of surface occupancy or ground disturbance is prohibited.

The intermountain west is possibly best poised to help the U.S. meet its near-term energy needs. The region already supplies more than 25 percent of our nation's natural gas, while occupying less than 1 percent of federal lands in the region. Production from this region has grown by nearly one billion cubic feet a day this year, and has grown more than 50 percent in the last decade.

Recently, there have been misleading claims that U.S. energy companies are not actively developing federal lands they have already under lease. As a remedy, congressional leaders have proposed use-it-or-lose-it legislation in the Drill Act. The use-it-or-lose-it approach is the wrong approach and would not solve the real

problems that exist with developing federal leases, which are the extensive restrictions, expensive permitting requirements, bureaucratic delays, and frivolous lawsuits that hinder timely development of American energy supplies.

Drilling new wells is and will continue to be critical to maintaining supply. To highlight this point, consider the fact that 50 percent of the natural gas we use today comes from wells that were drilled in the last 3½ years. In fact, according to the Cambridge Energy Research Associates, natural gas drilling in the intermountain west will need to increase 75 percent over the next 10 years to sustain current production levels.

If Congress increases the demand for natural gas by moving forward with cap-and-trade legislation to reduce CO_2 emissions, it should carefully consider policies that ensure timely access to some of the most promising areas for future supply. Ignoring the current policies that contribute to bureaucratic delays and limit access to federal lands will only serve to deepen our nation's energy challenge.

Please consider the following list of policy recommendations as tangible, near-term steps that can be taken to ensure supply. Congress should increase the budget for the Bureau of Land Management oil and gas programs so that the agency has the necessary staff and resources to process applications for permits to drill and rights-of-way for gathering and pipeline infrastructure.

Congress should consider ways to shorten the timeframe for processing APDs and other environmental analysis. The bureaucratic delays and runaway costs associated with environmental studies provide no additional environmental protections. Instead, they artificially restrict the development of new supplies of oil and natural gas.

Congress should not delay the leasing of areas with significant natural gas resources. Legislation currently pending before Congress, such as the Roan Plateau Oil and Gas Leasing Improvement Act of 2008 would place significant restrictions on the development of new natural gas supplies on the former naval oil shale reserves.

Congress should carefully consider how the creation of new wilderness areas will limit America's ability to meet future energy needs. The Red Rocks Wilderness Act and the Colorado Wilderness Act of 2007 present specific threats to some of our nation's largest supplies of natural gas.

Congress should also consider limiting the ability of obstructionist groups to stop leasing, exploration and development on federal lands. And Congress should appropriate the statutorily mandated funds for research and development of new technologies, the section 999 program.

The CHAIRMAN. If you could summarize, Mr. Smith.

Mr. SMITH. As this committee examines the daunting task of ensuring America's energy independence and addressing the important issue of climate change, independent oil and gas producers stand ready to help. Thank you for allowing us to appear today.

[The statement of Mr. Smith follows:]

Testimony Before the House Select Committee on Energy Independence and Global Warming

Marc W. Smith
Executive Director
Independent Petroleum Association of Mountain States

July 29, 2008

Mr. Chairman and Members of the Committee—thank you for the opportunity to be here today to discuss the essential role that natural gas will continue to play in our nation's energy policy and the importance of continued access to our federal lands in order to meet America's growing energy needs.

I am here today on behalf of the Independent Petroleum Association of Mountain States (IPAMS). IPAMS is a non-profit organization with more than 400 independent oil and natural gas producers, pipeline and gathering companies, service and supply companies, financial institutions and industry consultants committed to environmentally responsible oil and natural gas development in the Intermountain West.

Although you are probably not familiar with the names of most independent oil and natural gas companies, they create the backbone of our nation's energy supply, drilling 90% of U.S. wells and producing 82% of our nation's natural gas. These companies are mostly small businesses that don't have refining and retail operations such as gasoline stations, but instead direct their efforts toward finding and producing oil and natural gas here in the U.S. In fact, most independents reinvest 100% or more of their cash-flow into new development projects.

America's independents are a true home-grown success story. They are energy farmers who have survived decades of turbulent cycles in the energy market and never gave up. Armed with new technologies and a new generation of high-tech savvy employees, they are producing energy from complex tight sand and shale reservoirs that were thought to be uneconomic just 10 years ago. Much of their success story revolves around natural gas and the hope it brings as we try to tackle the twin goals of energy independence and a creating a less carbon intensive economy.

Since natural gas is a clean, abundant and domestically produced fuel, it has long been viewed as an attractive fuel for peak-load electricity generation, space and water heating, transportation, and manufacturing uses. It is also critical to food production and industrial and petrochemical applications.

Fortunately, the technology needed to produce additional natural gas already exists. It has been tested and proven capable of providing a safe, reliable and

affordable domestic supply of energy. As proof of this fact, look to U.S. natural gas production which is up eight to ten percent this year, while demand is growing at a rate of less than one percent.

Natural gas doesn't compete with renewable energy; it helps make the vision a reality. Greater energy production from intermittent sources of power like wind and solar are possible because natural gas electric generation is available to fill-in during the large gaps of time when the wind isn't blowing and the sun isn't shining. Renewable sources of energy make up only a tiny fraction of electrical power today (wind produces 0.77 percent of the total electrical power supply and solar produces 0.01 percent of the total electrical power supply), however, as more energy comes from these sources, more natural gas will be needed to back it up.

As the cleanest burning fossil fuel, natural gas will also play an increasingly important role in a carbon-constrained world as an essential part of any plan to reduce greenhouse gas emissions. Recent studies predict that increased supplies of natural gas will be needed in order to implement the climate change polices under consideration today.

Policies that intentionally place limits on the development of new supplies of natural gas from onshore and offshore federal lands are counterproductive to the goals of both energy independence and reducing the carbon intensity of our economy. It is reckless to promote plans that are designed to fail. If we increase demand for natural gas, we need corresponding policies that plan for the development of new supplies.

Natural gas producers don't need special subsidies. They need access to the places where energy resources are found, and a predictable regulatory and tax structure in order to make long-term investment decisions that ensure uninterrupted supply.

Some of the most promising areas for future development of natural gas are the Outer Continental Shelf (OCS) and onshore federal lands in the Intermountain West. In total, 279 million acres of federal land have oil and natural gas potential. Of these acres, 145 million are closed to leasing, and another 20 million are inaccessible because surface occupancy or ground disturbance is prohibited. This Congress could help put America on a path to greater energy independence and sustainable energy future by lifting restrictions on OCS drilling and addressing the barriers that are limiting development of new supplies in the Intermountain West.

The Intermountain West is best poised to help the U.S. meet it near and mid-term energy needs. Natural gas production has grown more than 50 percent across the region during the last decade. This year alone, natural gas production in the Intermountain West has grown by nearly one billion cubic feet at day (Bcfd).

Most are surprised to learn that the region supplies more than 25% of our nation's natural gas while occupying less than one percent of federal lands in the region. This small and temporary disturbance not only creates wealth for federal and state governments through royalties and taxes, it also creates high paying jobs and important economic activity in rural Western economies.

The public lands of the Intermountain West hold vast amounts of natural gas that can supply America with the energy it needs for generations to come. New pipelines will be needed to bring additional supplies to market, but this challenge is small in comparison to the political uncertainty caused by those in Congress who continue to send mixed messages about their support for domestic oil and gas.

Vast natural gas resources lie beneath our public lands in the West, and access to these lands—which belong to all Americans—is vital if we are to continue supplying American consumers with the energy they need travel to work, heat and cool their homes, light their offices, and cook their food. According to the EPCA III study, of the 45,660,000 acres of federal lands in the Western region with oil and natural gas potential, leasing is prohibited on 21,943,000 acres (48.1%). Surface occupancy is prohibited on 3,213,000 acres (7%) and 10,295,000 acres (22.6%) have extra with stipulations beyond what is standard lease terms. Only 10,208,000 acres (22.4%) have standard lease terms, which are still very protective when compared to international standards.

Recently, there have been misleading claims that U.S. energy companies are not actively developing the federal lands they already have under lease. As a remedy, Congressional leaders have proposed "Use it or Lose It" legislation (HR 6515). The "use-it or lose it" approach would not solve any problems, and would instead create a new significant hurdle to entrepreneurs in this country willing to risk their capital, and navigate expensive permitting requirements and time consuming roadblocks such as environmental lawsuits, to explore and develop American energy for America.

In the major energy producing states of the Intermountain West (NM, UT, CO, WY, MT) plus North Dakota, there are more than 38,000 active leases, covering more than 31 million acres, slightly over 17 percent of the total mineral acreage administered by BLM in those states (please see accompanying table). Over 10 million acres of these leases – or more than one third the total leasehold acreage – are in "producing status" as determined by BLM. These facts contradict the common misconception that oil and natural gas companies are maintaining large inventories of non-producing leases.

While not every leased acre of land is currently producing energy, independent natural gas companies in the Intermountain West are doing everything in their power to find and produce energy from the lands they lease. With the regulatory hurdles currently in place and the lawsuits and protests that accompany

practically every lease sale, companies are in an all-out sprint to develop their leases within the current ten year lease term. For more information, please see that attachment *The Flaws of "Use It or Lose It" Legislation;* and the *Onshore Permitting Flowchart.*

Not only do we need continued access to federal lands that are currently open for leasing, but future energy demands mean we will need access to lands that are now inaccessible. Drilling new wells is critical to maintaining supply. To highlight this point, consider the fact that 50% of the natural gas we use today comes from wells that were drilled in the last 3 ½ years. In fact, according to Cambridge Energy Research Associates, natural gas drilling in the Intermountain West will need to increase by 75% over the next 10 years to sustain current production levels.

If Congress increases the demand for natural gas by moving forward with cap and trade legislation to reduce CO2 emissions, it should carefully consider policies that ensure timely access to some of the most promising areas for future supplies. Policies that create bureaucratic delays, further limit access to federal lands, and increase financial burdens on domestic energy producers will decrease our supplies of natural gas and deepen our nation's energy challenge.

As this committee examines the daunting task of ensuring America's energy independence and addressing the important issue of climate change, independent oil and gas producers stand ready to help.

Please consider the following list of policy recommendations as tangible near-term steps that can be taken by Congress to increase domestic oil and natural gas supply:

- Congress should increase the budget for the BLM oil and gas program so that the Agency has the necessary staff and resources to process Applications for Permit to Drill (APDs) and Rights of Way (ROW) for gathering and pipeline infrastructure. Congress is currently planning to significantly reduce the BLM budget for managing of oil and gas development on federal land. Budget reductions will limit the Agency's ability to process permits to drill and will limit the development of new supplies of oil and natural gas.

- Congress should consider ways to shorten the timeframe for processing APDs and associated environmental analysis. The bureaucratic delays and runaway costs associated with environmental studies provide no additional environmental protections, instead they artificially restrict the development new supplies of oil and natural gas

- Congress should not delay leasing areas with significant natural gas supplies. Legislation currently pending before Congress, such as the Roan

Plateau Oil and Gas Leasing Improvement Act of 2008 (HR 5851), would place significant restrictions on the development of natural gas on the former Naval Oil Shale Reserves 1 & 3 (located on a tiny portion of Colorado's Roan Plateau). The current BLM plan for developing these lands resulted from a nearly decade-long open and public process in which all stakeholders, including Colorado's Congressional delegation as well as private citizens and industry and environmental groups we're given a seat at the table. The current BLM plan is by far the most environmentally restrictive that industry has ever seen, requiring, among other things, that only 1% of the surface be disturbed at any given time.

- Congress should carefully consider how creation of new Wilderness areas will limit America's ability to meet its future energy needs. The Red Rocks Wilderness Act (H.R. 1919 / S.1170) and the Colorado Wilderness Act of 2007 (H.R. 3756) present specific threats to some of our nation's largest supplies of natural gas. Legislation that prohibits energy development on even more of our public land—land that belongs to all Americans—will do nothing to address the energy challenges that we now face.

- Congress should limit the ability of obstructionist groups to stop leasing, exploration and development of federal lands. When such groups file frivolous lawsuits that delay development, they should be required to reimburse the federal government for the opportunity cost of the energy that didn't get produced.

- Congress should fund the statutorily mandated funds for the Research and Development of New Technology (the Section 999 Program). It is critical that federal energy policy makers understand the opportunities and technological challenges that must be seized upon in order to fully develop our clean domestic natural gas and other petroleum resources.

On behalf of the America's independent domestic energy producers, thank you for the opportunity to appear before you today.

The CHAIRMAN. Thank you, Mr. Smith.

Next, we welcome Mr. Clay Harris, a geologist by training and the CEO and president of Suez LNG North America, an international energy company that is one of the main LNG importers in the U.S. market.

Please begin whenever you are ready.

STATEMENT OF CLAY HARRIS

Mr. HARRIS. Thank you, Chairman Markey and members of the committee, for inviting me to present testimony regarding LNG and for your leadership on the important issues of energy independence and global warming.

I will concentrate on three points. First, LNG can contribute substantially to a region's energy supply. As you know, Mr. Chairman, our terminal in Everett meets 20 percent of New England's natural gas demand. We supply the fuel for one of the region's largest power plants, which can generate enough electricity for 1.5 million homes. If LNG resources were not available in New England, supplies would be far tighter and consumers would suffer.

We are also starting construction of our new offshore re-gasification system near Gloucester, which is designed to provide an additional 400 million cubic feet a day to the New England market. In Florida, we are working to complete the permitting process for a similar offshore re-gasification facility near Fort Lauderdale. This project could ultimately bring as much as one billion cubic feet a day of natural gas to the Florida market. We believe that wherever there is a re-gasification facility, LNG keeps downward pressure on prices by helping to diversify and increase a region's energy supply.

Second, LNG alone cannot meet all of our growing needs for natural gas. We view LNG as an important energy source in addition to other North American natural gas supplies, not as a substitute for them. As a nation, we need to do a better job of developing our natural resource base, in part because traditional fuel sources are going to be the backbone of the energy system for some time.

We at Suez are fully committed to renewable energy, with about 430 megawatts of renewable capacity either installed or under construction, and another 2,000 megawatts in development, but the data is clear. Last year, renewables account for 4.4 quadrillion BTUs of the more than 101 quads that we consumed. By comparison, fossil fuels accounted for 86 quads of energy last year. Consequently, we believe that we will need more supplies of natural gas, including LNG, in the future.

In the last few years, expansions and new construction have raised LNG re-gasification capacity in North America to around 14 billion cubic feet a day. By 2015, that number will be more than 22 billion cubic feet a day.

With respect to actual imports, even though 2008 imports of LNG will likely be only half of 2007 imports, they are projected to return to 2007 levels next year and continue to increase. EIA has projected that by 2030, we could bring as much as 2.8 tcf of LNG into the United States, which could be as much as 10 percent of the total gas demand.

On a related note, it is important for policymakers who are concerned with our energy security and carbon emissions to look at op-

portunities to further improve the use of natural gas in electric power generation. Right now, natural gas accounts for about 20 percent of electricity generation, and it is clear that it is being looked to as a bridge fuel for power generation for the foreseeable future.

Unfortunately, in some regions, particularly those that have not adopted competitive and fully transparent tocell power markets, older, less efficient natural gas power plants continue to operate, while newer, more efficient and cleaner natural gas power plants remain idle or underutilized. Such inefficient use of natural gas not only increases emissions and wastes natural gas, but increases the electricity cost to the consumer.

Third, I would like to address the international aspects of LNG. While LNG is a global commodity, it is premature to talk about a world gas price. In reality, there are several regional markets for natural gas and the prices in each one vary according to local circumstances. Additionally, on a global scale, there is more re-gasification capacity than there is liquefaction capacity. That is the nature of the LNG business model. More re-gasification capacity provides flexibility in supply and price responsiveness to markets, but also means a growing proportion of the LNG marketplace, perhaps as much as 20 percent, consists of divertible cargoes.

Finally, the presence of LNG means that there are some interrelationships between the regional gas markets. For instance, when Japan's gas demand spiked last autumn due to a shutdown of nuclear units, divertible LNG went to Japan. Similarly, when the price of natural gas in Great Britain dropped last spring and summer, divertible LNG wound up being shipped to the United States. Those transfers simply reflect market dynamics.

Thank you again for inviting me. We think LNG can be and is an important part of the energy supply equation for the United States. I look forward to answering any questions you might have and working with the committee on these important issues.

Thank you.

[The statement of Mr. Harris follows:]

Testimony of

CLAY HARRIS

PRESIDENT AND CEO
SUEZ LNG, NA

Before the

Select Committee on Energy Independence and Global Warming
United States House of Representatives

July 30, 2008

Testimony of
Clay Harris
President and CEO
SUEZ LNG, NA

Before the

Select Committee on Energy Independence and Global Warming
United States House of Representatives

July 30, 2008

Thank you, Mr. Chairman and members of the Committee for inviting me to present testimony regarding the natural gas market and, more specifically, the role of liquefied natural gas (LNG) in the larger marketplace.

My testimony today will concentrate on three important points related to LNG.

First, I think it is important to recognize that LNG can contribute substantially to a region's energy supply. For instance, our terminal in Everett, Massachusetts has operated safely and reliably for 37 years and meets 20% of New England's natural gas demand. LNG supplied to the region from the terminal meets 35-40% of region's demand on peak days. In addition we are supplying the fuel for one of New England's largest electric generating stations, a 1,550 megawatt powerplant, which can generate enough electricity for approximately 1.5 million homes each year. If LNG resources were not available in New England, supplies would be far tighter and consumers would suffer.

That circumstance also pertains in other places, especially in those places at or near the end of the pipeline system or where pipeline capacity is not as robust as it could be. In New England, we are in the process of initiating construction of our new offshore regasification system designed to supplement our cargoes into Everett. The Neptune Project will consist of specially designed vessels that will both transport and regasify LNG, which will then be able to be delivered into the HubLine sub-sea pipeline. Neptune has been designed to provide on average an additional 400 Mcf per day to the New England market, providing the energy the region needs to keep growing.

In Florida, we recently received the final Environmental Impact Statement and are working to complete the permitting process for a similar offshore regasification facility near Ft. Lauderdale which will bring much-needed gas to another area that is at the end of the pipeline system. That project could ultimately bring as much as 1 Bcf of natural gas per day into a Florida market whose need for the additional supply grows every day.

In short, wherever there is a regasification facility, LNG keeps downward pressure on prices by helping to diversify and increase a region's energy supply. By competing openly and fairly with gas delivered via pipeline, LNG helps ensure that consumers get the best deal possible.

There are two other important advantages of LNG. First, LNG helps us access the ample supplies of natural gas around the world. Estimates of the total world supply of traditional natural gas hover just north of 6 quadrillion cubic feet, and more reserves of natural gas continue to be discovered. Much of this natural gas is stranded a long way from market, or in countries that do not need large quantities of additional energy. Second, liquefying natural gas and shipping it is more economical than transporting it in pipelines for distances of more than about 700 miles offshore or more than 2200 miles onshore.

Second, even with our obvious enthusiasm for LNG, we recognize that LNG alone cannot meet all of our growing needs for natural gas. We view LNG as an important energy source in addition to other North American natural gas supplies, not as a substitute for them.

LNG needs to be thought of as complementary to our current resource base. This is a very important point. We think that all stakeholders should recognize the fundamental reality that we need to better access and develop our Nation's natural resource base.

We believe that the U.S. must increase its domestic production of natural gas. Recent legislative, regulatory and market trends have placed greater demands on our gas supply without taking commensurate steps to increase production. It seems likely that the regulatory drive to increase reliance on natural gas for a host of purposes, including electric power generation and transportation will not abate any time soon. Such policies strike me as unwise in the absence of any plans to develop more natural gas resources through domestic production and increased LNG imports to the U.S. market.

According to the Energy Information Administration (EIA), natural gas production in the U.S. is predicted to decrease from 20.0 Tcf in 2007 to about 19.4 Tcf in 2030. At the same time, total natural gas consumption is expected to increase from 23 Tcf in 2007 to about 25 Tcf in 2025. It is not complicated math to see that demand is outstripping supply. We can talk for a long time about the reasons for higher prices, but the underlying fundamentals are pretty clear. When demand is increasing and supply is steady or dropping, it makes no difference whether you are buying and selling toast or helicopters or natural gas – prices are going to increase.

And it seems unlikely that the market for traditional fuel sources will go away anytime soon. We at SUEZ currently have 251 megawatts of renewable capacity installed, another 179 megawatts under construction, and yet another 2000 megawatts in development. At the same time, it is important to recognize that in 2007 renewables accounted for 4.4 quadrillion Btus of the more than 101 quads of energy that we consumed. By comparison, fossil fuels accounted for 86 quads of energy last year. The story the data tell seems pretty straightforward. Traditional fuels – including natural gas – are going to be the backbone of the energy system for at least a little while longer.

Consequently, many are concluding that LNG represents an important part of the long-term natural gas supply solution. I think we can be an important part. In the last few years, expansions of current facilities and new LNG regasification facilities have raised capacity in North America to around 10 Bcf per day now, with another 3.8 Bcf per day capacity currently under construction in North America. We expect that by 2015 the total regasification capacity in North American will be about 20 Bcf per day.

Precisely because it provides unique flexibility, LNG will continue to grow as a resource for the United States. In our ongoing effort to diversify our supply of energy, LNG's exceptional and exclusive ability to transport what was once stranded natural gas from various sources can only help. In short, increased access to global reserves of energy helps us reduce our dependence on any one source.

Additionally, as response to demand becomes more important, our ability to move natural gas to where it is needed, freed in part from the constraints of pipelines, will ensure that LNG is an increasingly important element in our Nation's energy supply portfolio. Simply put, LNG offers greater trade flexibility than pipeline transport, allowing cargoes of natural gas to be delivered where the need is greatest and the commercial terms are most competitive.

In the near term, even though 2008 imports of LNG are projected to be about half of 2007 imports, they are projected to return to 2007 levels in 2009 and increase thereafter. This quick recovery is because additional liquefaction capacity in West Africa and the Middle East, which will serve the Atlantic basin, will be coming on line shortly.

As EIA has noted, while bouncing a bit over the last few years, the general trajectory of LNG imports into the United States has been increasing, from nearly 240 Bcf in 2001 to 771 Bcf last year (which represents a little less than 3% of total demand). Factors ranging from additional sources of supply to lowered costs for liquefaction and shipping have contributed to the increase. EIA has projected that by 2030 we could bring as much 2.8 Tcf of LNG into the United States, which could be as much as 10% of total demand.

On a final and related note, it is also important for policymakers who are concerned with our energy security and carbon emissions to look at opportunities to further improve the use of natural gas in electric power generation. Right now, natural gas accounts for about 20% of electricity generation, and it is clear that it is being looked to as the bridge fuel for power generation for the foreseeable future. It is important for policymakers to ensure that incentives are in place to use the most efficient and cost effective power plants in the natural gas generation fleet.

Unfortunately, in some regions -- particularly those that have not adopted competitive and fully transparent wholesale power markets -- older, less efficient natural gas power plants continue to operate while newer, more efficient and cleaner natural gas plants remain idle or underutilized. Such inefficient use of natural gas not only increases emissions and wastes natural gas, but increases the electricity costs for the consumer. More transparent wholesale power markets and increased investment in the electric transmission grid can significantly improve the efficient use of natural gas while lowering cost to consumers.

Third, I would like to address for a moment the international aspects of LNG.

It is important to recognize that while LNG is a global commodity, it is premature to talk about a "world gas price". In reality, there are several regional markets for natural gas, and the prices in each one vary according to local circumstances, needs, and even legal and regulatory traditions and precedents.

At the same time, with respect to LNG, it is important to note a few features. First, globally, there is more regasification capacity than there is liquefaction capacity. That is the nature of the LNG business model – more regasification capacity provides flexibility in supply and price responsiveness to markets. While this imbalance may moderate as more liquefaction comes on line in the next few years, for right now at least that means that regasification facilities compete for supply. Some companies hedge some of this by engaging in long-term contracts. We have committed supply to the region, but the reality is that some growing portion of the LNG marketplace – perhaps as much as 20% -- consists of divertible cargoes. That means that the divertible LNG will go where the prices are highest. It does not necessarily mean that world prices will converge.

Second, the presence of LNG means that there are some interrelationships between the regional natural gas markets. For instance, when Japan's gas demand spiked last Autumn due to a shutdown of some of their nuclear units, divertible LNG went to Japan. Similarly, when the price of natural gas in Great Britain dropped last Spring and Summer, divertible LNG wound up being shipped to the States. That is neither good nor bad; it reflects market dynamics.

As we think about these things, it is important to note that we are talking about amounts on the margins of global natural gas demand and consumption.

Third, I know that there is some concern about the potential for those nations who control much of the LNG supply and liquefaction to join together in a way that will ultimately serve to damage the United States. Experience with international cartels is that they have limited ability to set the price of a resource over the long-run. Additionally, the fact is that that possibility will exist whether we utilize extant global LNG resources or not. We think it makes no sense not to engage in international energy trade when and where the costs are competitive with the costs to produce energy in North America.

That said, we are taking steps to minimize our customers' exposure to any possible market pathology. We are working with the companies and Nations which supply LNG to ensure that we have access to long-term supplies at reasonable prices. Most of our gas right now comes from Trinidad, and we are confident both that they have sufficient resources for our needs and that our relationships with them are sturdy and enduring.

Thank you again, Mr. Chairman and Members of the Committee for inviting me to present our thoughts on possible approaches to help moderate natural gas prices and, more specifically, the role of liquefied natural gas in the larger marketplace. I look forward to answering any questions you might have and working with the Committee on these very important issues.

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

Now turning now from natural gas production to its use, we welcome Mr. David Manning, the executive vice president of U.S. external affairs at National Grid, an international electricity and gas supplier. He has previously served as the executive vice president and chief environmental officer of KeySpan, one of the nation's largest gas distributors. Early in his career, he served as deputy minister for energy of the province of Alberta in Canada.

So we welcome you, Mr. Manning. Whenever you are ready, please begin.

Move in closer to the microphone, please.

STATEMENT OF DAVID MANNING

Mr. MANNING. Thank you very much. That is better. I apologize.

If I could speak with the mic from the consumer's end of the pipeline. Just a quick word about National Grid. We are one of the largest distributors of natural gas and electricity. We have about 9,000 miles of transmission. We serve about 15 million people. We move 718 billion cubic feet of gas per year to generators and to home and to businesses which accounts for about 3 percent of the U.S. supply.

So obviously, these issues are very critical to us. We spend about $1.5 billion in energy efficiency programs in New England alone. Energy efficiency is obviously one of our primary missions as a company, both on the gas and electric side. So we do believe that while natural gas is critically important and offers a great advantage in terms of its CO_2 emissions, it is also the fuel which facilitates the greatest opportunity for energy efficiency technology.

So if I could just go a little bit further. The generation side of natural gas is critically important to the Northeast. Forty percent of the generation in New England is now running on natural gas, slightly more than that. In New York, it is probably about 12 percent pure natural gas, but about 24 percent of the plants in New York state run on some combination of gas and oil.

We are the largest—today, we are the largest independent power generator in New York state and all of our plants, of course, are running on natural gas currently, which is better for the environment and also has a price advantage, so it is critically important.

But more important than that, of course, if I could just repeat, and I know that the chairman brought this up, pounds per billion BTUs of energy, 117,000 for natural gas, 164,000 for oil, 208,000 for coal. This is not to say that we shouldn't try and drive our clean-coal technologies and shouldn't find ways to improve the use of all these energy fuels, because as every member has pointed out, your constituents are being afflicted by high energy costs.

So I think National Grid's agenda is we need to first and foremost drive energy efficiency of all fuels, and the fuels that we do use not only must be available, but they must be used in the best way possible, both for the environment and also in terms of energy efficiency to reduce our dependence on imported fuels.

So turning to electricity just again, not only do you have the opportunity for combined cycle cogeneration—there is a wonderful plant in Oregon I had the opportunity to cut the ribbon in a former life, as the chairman pointed out—where natural gas comes in and

runs the generator. The waste heat from that generator runs a second turbine. Two sources of power go to Spokane. That, of course, is cogeneration, so you have two sources of power.

The waste heat from that second—now, it is still waste heat from the generator—goes out the back end, so for those of you who haven't been, Idaho and Oregon have a lot of potato farms, all run by satellite. It is wonderful to see. The waste heat from that steam blows the skin off the potato, slices, fries, freezes, and cycles back into the plant.

Now you have taken a power generator into a much higher efficiency level, and of course that same kind of technology is available at homes, businesses, with the technologies like combined heat and power, which of course are driven primarily and best by natural gas.

Honda has the best example we have seen, which is freewatt, which is a unit for the home which we can discuss in a moment. Also, natural gas vehicles, we have tremendous expertise I believe as a company. This has been an issue for us for many years. Mass Bay Transit, we have converted over one-third of their fleet, 100 percent of the vehicles in the Long Island bus fleet are operating now on natural gas. We have a fleet of Honda natural gas vehicles for our customer service. We have our own corporate fleet of natural gas vehicles.

Our benefits, however, have been primarily in fleets, and our current emphasis is on school buses. We have converted the entire school division because those school buses not only are running more efficiently, but they are also improving the air quality of the passengers, which we think is a critically important opportunity.

Not to leave aside, however, electric vehicles, because again our point is these are prime fuels. They are premiums fuels and we must use them efficiently. We have a combined cycle plant, the most efficient plant in New York. It has not stopped since the day it started in 2004. But between the hours of 2 a.m. and 6 a.m., it drops from 250 watts to 160. So the idea of plugging in your hybrid to a windmill is a great idea, but in the near term plugging into Ravenswood dramatically improves the air quality from that point alone.

I look forward to your questions. Thank you, Mr. Chairman.

[The statement of Mr. Manning follows:]

U.S. House of Representatives
"What's Cooking with Gas: the Role of Natural Gas in Energy Independence and Global Warming Solutions"

July 30, 2008

Testimony of David J. Manning,
Executive Vice President, U.S. External Affairs, National Grid

Good morning. My name is David J. Manning and I am the Executive Vice President, U.S. External Affairs, at National Grid.

I wish to thank Chairman Markey and ranking member Sensenbrenner for conducting this timely and important inquiry into the importance of natural gas in today's U.S. energy mix.

In particular, I appreciate Chairman Markey's longtime leadership role in the energy sphere, both nationally and regionally. Chairman Markey deserves particular credit for the building, lighting and appliance efficiency improvements and the vehicle fuel economy (CAFE) standards included in the Energy Independence and Security Act of 2007.

I also wish to acknowledge the Chairman's assistance with the development of the Iroquois Natural Gas Pipeline which introduced western Canadian natural gas to the Northeast. That project significantly lowered the cost of gas by bridging the environmentally sensitive Northeast to a vast supply of the preferred carbon fuel.

National Grid

National Grid is one of the largest investor-owned utilities in the world—with a market capitalization of $38 billion. It is known for its expertise in transmission and distribution of electricity and natural gas, particularly in complex urban environments.

In the U.S., National Grid is the second largest natural gas and electric utility, serving approximately 15 million people in Massachusetts, New York, Rhode Island and New Hampshire. Grid's U.S. employment is 17,000 and its new U.S. headquarters—a cutting edge, green-certified building—is under construction in Waltham, Massachusetts.

National Grid's core business includes:

- National Grid has an extensive electric transmission business—with 9,000 miles of transmission stretching from the suburbs of Boston west to Lake Erie and from the Canadian border south to Rhode Island Sound.
- National Grid has large ownership interests in three natural gas pipelines serving the Northeast—the Iroquois, Millennium, and proposed Islander East projects.
- National Grid is the largest U.S. importer of liquefied natural gas (LNG). LNG imports are vital during times of peak demand, such as cold winter days. Most of the liquefied natural gas coming into the Northeast is from Trinidad, provided through the Suez terminal in the Boston Harbor.
- National Grid delivers to firm customers and the generation market over half a trillion cubic feet of natural gas per year, over 3% of U.S. gas supply.
- National Grid has spent in excess of $1.5 billion on energy efficiency programs in New England going back thirty years. Those programs have now been introduced to the state of New York in the residential and commercial sectors.

National Grid is committed to environmental excellence. We are 37% of the way to our company-wide target of an 80% reduction of our greenhouse gas emissions by 2050 under our "Power of Action" program. In the U.S., we have worked closely with governments, industry, environmental groups, and other stakeholders in Massachusetts, New York, Rhode Island, and New Hampshire on the development of the Northeast Regional Greenhouse Gas Initiative (RGGI), state renewable portfolio standards, and state efficiency and conservation programs to meet the economic and environmental challenges facing our region.

We emphasize that National Grid is a natural gas distributor. The commodity cost makes up the majority of the bill that a Grid customer receives. It also represents the largest component of the electricity cost borne by the consumer from gas generated power. The price of natural gas is a North American price, but is impacted by the current world price of oil, as many large gas consumers have been able to switch to natural gas to avoid high oil prices. Therefore, while the price of natural gas is not linked to the world oil price, fuel switching does put pressure on natural gas as the oil price increases.

While National Grid appears with expertise in electric generation, transmission and distribution, as well as natural gas transmission and distribution, my own background may be of interest. Early in my career, I served as Deputy Minister for Energy for the Province of Alberta, Canada, a major source of natural gas for the U.S. I was President of the Canadian Association of Petroleum Producers, a trade group representing most natural gas producers exporting to the U.S. I was also a delegate to the Kyoto conference on climate change in 1997, having worked continuously on climate change abatement strategies for the past 15 years.

Later, I co-chaired the working committee on natural gas demand for the National Petroleum Council's 2003 study: "Balancing Natural Gas Policy – Fueling the Demands of a Growing Economy" (www.npc.org).

Natural Gas

The efficiency, cleanliness and reliability of natural gas make it increasingly popular:

- According to the U.S. Department of Energy (DOE), natural gas consumption will increase by 11% by 2020—even though businesses and consumers are making great strides in efficiency. Indeed, per capita residential and commercial natural gas consumption is declining because of efficiency gains. At current market pricing, efficiency gains have reached 5% according to the American Gas Association, even as the industry grows due to the efficiency, environmental benefits and relative cost of natural gas as a fuel.
- Natural gas supplies almost one fourth of U.S. energy needs, with 20 trillion cubic feet (Tcf) consumed in 2006.
- U.S. natural gas consumption is split four ways—33% industrial, 31% electric power generation, 22% residential and 14% commercial. Compared with the U.S. as a whole, Massachusetts and New York—Grid's two biggest markets—have lower shares for industrial, slightly higher shares for electric power, and substantially higher shares for residential and commercial.
- U.S. natural gas supply is split three ways—81% U.S., 16% Canadian, and 3% LNG (2006). The U.S. has an estimated 80 years of reserves at current consumption levels, though access to this supply is a challenge. Promising new areas in the U.S. include the Barnett shale formation in Texas and, closer to home, the Marcellus shale field stretching from New York to West Virginia. Canadian exports are declining long-term due primarily to increased demand at home and a maturing of the basin. New sources of natural gas are harder to find and the industrial sector continues to grow. Therefore, many expect LNG's market share to increase, although current world demand is driving a higher price than the U.S. domestic price.

- Natural gas delivery is through 300,000 miles of transmission lines which in turn feed 1.9 million miles of local utility distribution pipes. Most experts agree that additional pipeline infrastructure is necessary to ensure reliability and meet growing demand. In the Northeast context, a combination of pipelines serving the U.S. oil patch, western Canada and eastern Canada provide the bulk of our supply. New pipeline projects giving us access to Rocky Mountain and nearby Marcellus Shale production will be helpful.
- Natural gas is the cleanest fossil fuel. To compare, carbon dioxide emissions for a billion Btu of energy are 117,000 pounds for natural gas—compared with 164,000 pounds for oil and 208,000 pounds for coal (EIA).

We caution that we do not see the U.S. achieving "energy independence"—if that means complete independence from any foreign source of energy—but we do consider it possible—and imperative—for the U.S. to move towards energy security.

Natural Gas and Electrical Generation

In 1980, natural gas fueled less than 1% of the power generation fleet in New England. By 2006, natural gas use for power generation represented over 40% of New England supply. The availability of natural gas following completion of the Iroquois pipeline, the environmental benefits of natural gas, the relative efficiency of combined cycle power generation and the relatively low capital cost of gas-fired plants drove a new build of New England generators. Between 1998 and 2003, 10,000 megawatts were added.

In New York, in 2006, natural gas represented 12% of the power generation fleet, while 24% run on either gas or oil, or a combination thereof. 23% of the New Jersey generation uses natural gas.

As we all recognize, natural gas has increasingly become the "fuel of choice" for new power plants, with this trend accelerating with existing state and regional and potential nationwide carbon caps. The carbon footprint of a combined cycle natural gas-fired plant is significantly lower than one powered by coal or oil. It also is easier to site, emits no mercury, and has much lower emission numbers in NO_X and SO_X.

The good news is that these new state-of-the-art gas-fired plants are clean and efficient and they can be located in urban and suburban areas adjacent to the electric "load." Combined cycle or co-generation plans have dramatically improved the heat efficiency and reduced emissions per unit of power purchased.

In the near-term, the U.S. will need more of these facilities if we are to meet our environmental goals and provide a stable supply of electricity to meet growing demand. In our region as well as in many other parts of the country, new coal-fired plants are almost impossible to site.

New nuclear plants, while contemplated, have a high capital cost and are complicated by unresolved issues concerning nuclear waste. However, we do expect a new merchant nuclear plant will be built in Canada in the near future. National Grid has entered into a joint venture to build transmission connecting that plant, as well as renewable power, to bring carbon-free energy to Boston.

New renewable power enjoys great public support generally, but continues to face opposition in siting. National Grid believes transmission will be more critical to ensure renewable power gets developed where practical and is linked to major power loads. Expertise in "intermittent power" and the ability to site transmission will be key drivers in the development of renewable energy, particularly in complex urban environments.

Notwithstanding the advantage of natural gas for power generation, many in the industrial sector argue that the heavy use of natural gas for power plants imposes price pressure on natural gas—potentially harming all "direct users" of natural gas, especially the industrial sector which faces vigorous foreign competition.

We, of course, are aware of the contentious debate in Congress over energy in general and the concern over natural gas prices in particular.

Our position is that the U.S. needs a balanced approach to energy overall—all options must be on the table. Clearly, advanced energy efficiency poses the most available and cost-effective solution to current energy pressures. The cheapest power plant is the one that never gets built. We must work together to reduce consumption and increase production in a cost-effective manner that moves us towards energy security and addresses global warming.

Natural gas is the preferred fuel for our current technology electric supply for a number of reasons:

- It provides multiple high efficiency technology options in baseload plant generation.
- Natural gas can fuel modern "combined heat and power" generation "inside the fence", dramatically improving energy efficiency and lowering costs for commercial operators.

- Natural gas can power high efficiency appliances in the residential market (high efficiency furnaces achieve 92% efficiency) and new state-of-the art micro combined heat and power technologies for the home such as the Honda Free Watt.

Therefore, the U.S. should focus its attention on improved energy efficiency, including the power sector. Older, inefficient power stations utilizing 1950's technology must be repowered or replaced over time to conserve this non-renewable resource.

Natural Gas and Renewable Energy Generation

The massive development of renewable generation, including wind, solar, geothermal, traditional hydropower and tidal power, and the associated transmission and related infrastructure is imperative from a national security, economic and environmental perspective.

Because some forms of renewable generation are intermittent—i.e., the wind does not always blow—a combination of gas-fired and renewable generation is necessary for reliability.

To illustrate, National Grid has begun working with Bangor Hydro Electric Company on an electric transmission project facilitating the development of Maine and eastern Canadian renewable and low-carbon generation to serve the greater Boston and Connecticut markets and help meet New England renewable portfolio standards and the Regional Greenhouse Gas Initiative (RGGI). Importantly, the new generation and transmission from the project will increase reliability because much of New England's electric generation is dependent on Sable Island natural gas. In short, New England consumers benefit from the combination of gas-fired and renewable generation.

As I have emphasized throughout, there is no single solution for our nation's energy challenges, and we need a variety of strategies to meet our economic, environmental and security needs.

Natural Gas Vehicles

National Grid has a long commitment to the development of natural gas vehicles (NGVs). Vehicles fueled with natural gas can reduce carbon dioxide emissions by 85% to 90% and particulate and toxic emissions by 99%.

NGVs are most practical in fleets, such as busses, delivery and utility trucks, and corporate and government fleets, because fleets are centrally fueled and maintained and often have a given route or range of travel.

In Massachusetts, National Grid has led the way. We have helped convert about one-third of the Massachusetts Bay Transportation Authority (MBTA) bus fleet to natural gas.

In New York, National Grid has worked with transit agencies such as Long Island Bus and the MTA. Long Island Bus has converted its entire fleet of nearly 400 busses to natural gas.

We have also been working with school districts to improve student health and lower emissions from the school bus fleet. National Grid partnered with the Long Beach City School District, which serves 3,800 students, and with federal and state agencies to help the school district replace its 38 aging and less efficient diesel bus fleet with a combination of 20 new clean-fueled (CNG) busses and 18 diesel-fueled busses retrofitted with emission-reducing technology. Over their life span, these vehicles will displace 4.8 million pounds of pollutants and save 505,000 gallons of petroleum.

Energy Efficiency

National Grid, in partnership with other leading energy companies, asked McKinsey & Co. to look at energy efficiency. This landmark study, "Reducing U.S. Greenhouse Gases: How Much at What Cost?", found that the U.S. can make substantial emissions reductions by 2030 without damaging the economy with the help of energy efficiency. A good chart summarizing the study is attached, and the report itself is available via: www.mckinsey.com/mgi/publications/Curbing_Global_Energy/executive_summary.asp.

Studies show that efficiency programs average approximately 3 cents per kilowatt-hour (kWh)—as opposed to 12 cents per kWh for new generation. In short, the most cost-effective power plant is the one that isn't built.

Utilities like National Grid are uniquely positioned to continue to create and administer customized energy efficiency plans to meet the individual needs of their customers and service territories. This is, in large part, because we enjoy an ongoing relationship and regular communications with our customers.

Our efficiency programs are saving customers in New England over $250 million annually, after an expenditure of $1.5 billion on efficiency technologies.

- We have budgeted $130 million per year in electric and gas energy efficiency programs—an investment expected to double in 3-5 years.
- More than 4 million National Grid customer projects have been completed in New England to date, saving more than $3.6 billion in energy costs. This effort includes converting almost all of the public schools in the City of Boston from oil to natural gas.
- For small businesses, electric and gas efficiency programs include rebates; incentives and financial assistance for installing or purchasing high-efficiency equipment; onsite and online energy audits; and efficiency training and education.
- On the residential side, we're targeting a significant number of Northeast oil heating customers to convert to natural gas with rebates and incentives. When a residential customer replaces a dated oil heat appliance with a modern high efficiency gas furnace or boiler, carbon dioxide and other emissions can be reduced up to 40%, with savings of up to 40% in annual fuel bills.
- In 2007, we delivered energy efficiency to (1) 41,000 gas participants, saving 4.6 million thermal units and avoiding 27,000 tons of carbon dioxide; and (2) 1.8 million electric participants, saving 387,000 megawatts and avoiding 218,000 tons of carbon dioxide. Total carbon reductions equate to 48,068 cars not driven for one year.

The challenge for our industry is to connect a more informed consuming public through "smart meters" to a "smart grid", fed by a variety of energy sources including renewables and high efficiency carbon generation. As we invest heavily to improve our aging infrastructure, we must facilitate best available technologies and all forms of energy efficiency.

We are also pursuing "decoupling" which removes disincentives to energy efficiency in our sector and opens the door to incentives for reduced energy consumption.

Optimal Role for Natural Gas in Increasing Energy Security and Addressing Global Warming

Natural gas is essential to moving our nation towards energy security and addressing global warming. At the same time, natural gas is not the "silver bullet." The U.S. needs a balanced approach that includes a combination of energy efficiency and generation from renewable, clean coal, nuclear and natural gas-fired generation to meet its economic, environmental and national security needs.

This approach includes a commitment to (first) carbon reduction through changed behaviors and new technology; and (second) enhanced energy infrastructure. We must work with policy makers to break down the barriers to these important initiatives.

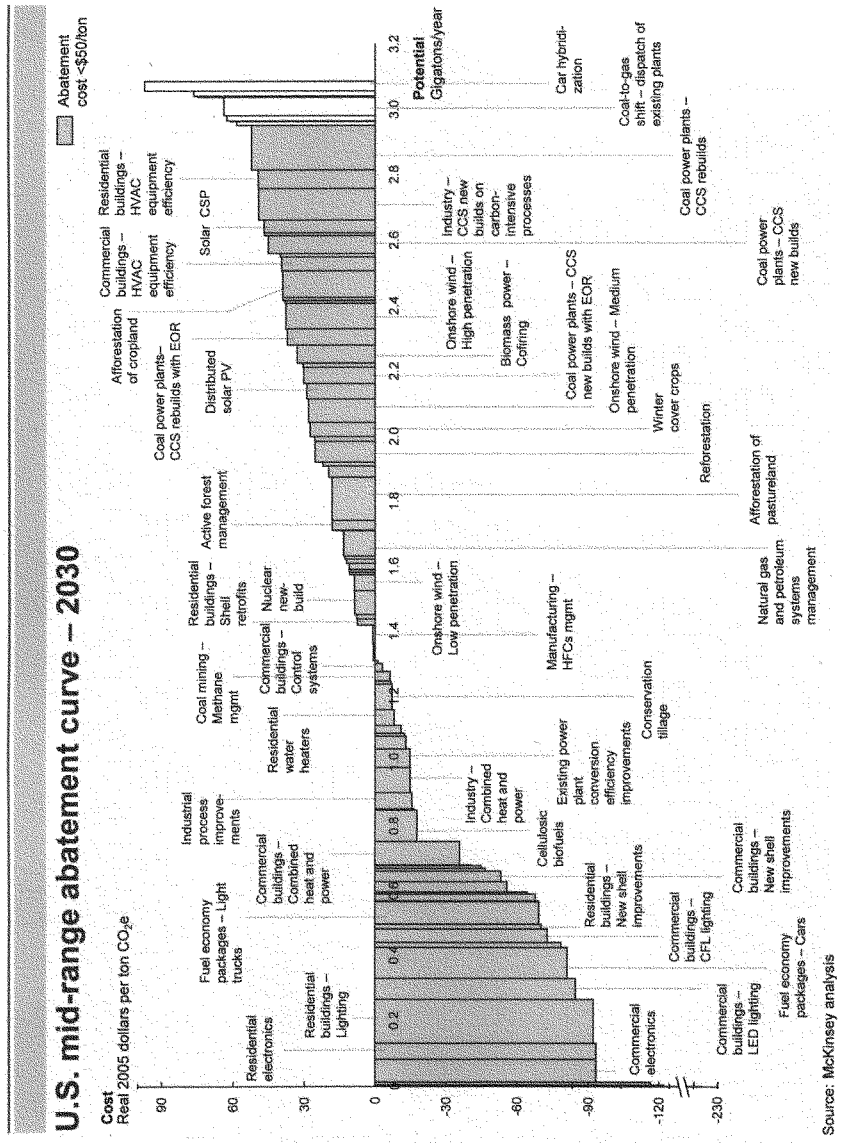
Continued uncertainty over nationwide carbon cap-and-trade legislation freezes investment in clean energy technologies. That's one reason National Grid supported the Boxer-Lieberman-Warner bill that the Senate considered earlier this year.

Similarly, continued uncertainty over infrastructure siting discourages investment needed to ensure economic growth, enhance system reliability, and address global warming. For example, because renewable generation typically is far from the load, new electric transmission is necessary. Unfortunately, even an environmentally sensitive transmission project can get bogged down in lengthy legal disputes. The same holds true with interstate natural gas pipelines that provide clean energy to industrial, commercial and residential consumers and to clean gas-fired power plants.

Conclusion

We should all keep in mind that energy is a challenge, but also an opportunity, for the innovators in our economy. Many of these innovators are based in the National Grid service territory, which includes numerous leading research institutions and start-up companies focused on energy and environmental solutions.

National Grid looks forward to working with Congress on energy and environmental issues. Once again, I appreciate the opportunity to appear before your Committee, and look forward to answering your questions. Thank you.


U.S. mid-range abatement curve – 2030
Abatement cost <$50/ton
Cost
Real 2005 dollars per ton CO_2e
90
60
30
0
-30
-60
-90
-120
-230
Potential
Gigatons/year
0.2
0.4
0.6
0.5
0.8
1.2
1.4
1.6
1.8
2.0
2.2
2.4
2.6
2.8
3.0
3.2
Residential electronics
Residential buildings – Lighting
Fuel economy packages – Light trucks
Industrial process improve-ments
Commercial buildings – Combined heat and power
Residential water heaters
Coal mining – Methane mgmt
Commercial buildings – Control systems
Residential buildings – Shell retrofits
Nuclear new-build
Active forest management
Coal power plants– CCS rebuilds with EOR
Distributed solar PV
Afforestation of cropland
Commercial buildings – HVAC equipment efficiency
Solar CSP
Residential buildings – HVAC equipment efficiency
Commercial electronics
Commercial buildings – LED lighting
Fuel economy packages – Cars
Residential buildings – New shell improvements
Commercial buildings – CFL lighting
Commercial buildings – New shell improvements
Cellulosic biofuels
Industry – Combined heat and power
Existing power plant conversion efficiency improvements
Conservation tillage
Onshore wind – Low penetration
Manufacturing – HFCs mgmt
Natural gas and petroleum systems management
Afforestation of pastureland
Reforestation
Winter cover crops
Onshore wind – Medium penetration
Coal power plants – CCS new builds with EOR
Biomass power – Cofiring
Onshore wind – High penetration
Coal power plants – CCS new builds
Industry – CCS new builds on carbon-intensive processes
Coal power plants – CCS rebuilds
Coal-to-gas shift – dispatch of existing plants
Car hybridi-zation
Source: McKinsey analysis

David J. Manning, Q.C.

Current Title:
Executive Vice President, U.S. External Affairs

Date Joined: April 1999 (KeySpan)

Responsible for:
David leads National Grid's U.S. External Team, with responsibility for federal relations and issues. He is also central to the company's U.S. and U.K. teams, handling all issues and functions external to the company from climate change to communications.

Experience:
After several years in private law practice in Canada (awarded a Queen's Council designation), from 1988 to 1993 David was resident in New York, as Senior International Trade Counsel for the government of Alberta focusing on International trade and energy issues. Following an intense effort to achieve the passage of the Canada - U.S. trade agreement, David focused on efforts to significantly increase the flow of natural gas from resource rich Alberta to the underserved U.S. Northeast.

Mr. Manning returned to Canada to be Deputy Minister of Energy for the Province of Alberta, Canada, the largest energy producing region in North America. He held this post from 1993 to 1995, a critical period in the development of Alberta's Oil Sands these deposits are the largest and most strategic resource available to the U.S. and now the focus of significant environmental issues and initiatives.

Mr. Manning then was selected to lead the Canadian Association of Petroleum Producers, a national trade association representing all significant oil and gas producers nationally and internationally. CAPP moved early in climate change response, initiating the first voluntary action recognition program in Canada in the early 90's. Mr. Manning was a delegate to the Kyoto conference on climate change in that capacity, in 1997.

More recently, Mr. Manning has served as Executive Vice President and Chief Environmental Officer of KeySpan, New York State's largest power generator and one of the largest gas distributors in the U.S. In that capacity, he was central to a "system repowering" of the Ravenswood power station (New York's largest) with the addition of combined-cycle capacity. Following KeySpan's acquisition by National Grid, Mr. Manning joins as EVP a company which has already achieved a 37% reduction towards its Kyoto targets and has mandated an 80% reduction in CO_2 emissions by 2050.

Mr. Manning remains active in the communities served by National Grid, including: Past Chair, Brooklyn Chamber of Commerce, and sits on the Boards of the New York City Police Foundation, Audubon New York, Long Island Housing Partnership, Citizen Budget Commission, and the New York League of Conservation Voters.

Education:
David was educated in law and has Bachelor of Arts and Bachelor of Laws degrees from the University of Alberta. He did post-graduate study in international law at Australian National University as a Rotary Foundation Fellow. He is a member of the Law Society of Alberta, the Canadian Bar Association, and is eligible for admission to the New York Bar.

Personal:
Mr. Manning is married to Jacqueline Siben, a lawyer in New York, and they have four daughters.

Telephone: 718-403-3323 Email: david.manning@us.ngrid.com

Grant Certification June 30, 2008

National Grid and I have not received any federal grant or contract during Fiscal Years 2006, 2007 or 2008.

David J. Manning
National Grid

The CHAIRMAN. Thank you, Mr. Manning.

Our next witness is Rich Wells, the vice president of energy at the Dow Chemical Company, one of the world's leading manufacturers of chemicals and plastics. Dow is committed to corporate sustainability and since 1990 has reduced its emissions of greenhouse gas emissions by 20 percent.

We welcome you, Mr. Wells. Whenever you are ready, please begin, if you can turn on the microphone and move it up close to you.

STATEMENT OF RICH WELLS

Mr. WELLS. It is on, thank you.

Thank you, Chairman Markey, Representative Sensenbrenner——

The CHAIRMAN. Pull in the microphone a little bit more close.

Mr. WELLS. Certainly.

Thank you, Chairman Markey, Representative Sensenbrenner, and other members of the committee. Thank you for the opportunity to provide our views on natural gas and its role in the future and energy climate change policy of our country.

First, I would like to address the role natural gas plays for Dow. As the nation's largest chemical and plastics producer, Dow uses natural gas and natural gas liquids as both a fuel and a raw material. For its global operations, Dow uses the energy equivalent of 850,000 barrels of oil each and every day. Of this total, approximately half is in the United States.

Dow converts natural gas and natural gas liquids into more than 3,000 products essential to our economy and our citizens' quality of life. These products serve as building blocks for everything from pharmaceuticals, insulation, electronic materials, fertilizers and much more.

The rising price of natural gas has had a dramatic impact on Dow's operating costs. In 2002, our total annual energy and feedstock bill was $8 billion. For this year, it is projected to be $32 billion. As a result, we have taken a number of actions necessary to sustain our operations and retain the ability to invest in our future.

Let me give you some examples of what we have done. Our relentless focus on energy efficiency has saved over 1,400 trillion BTUs of energy since 1994. That is enough to power every home in California for 16 months. We have shut down over 90 facilities since 2003. In the last 2 months, we have announced price increases totaling 45 percent. These increases will be reflected in the prices consumers pay for items such as trash bags, diapers, detergents, food and many other daily household items.

We are pursuing alternative and renewable energy end-feed stock projects. As an example, we are building a world-scale plastics plant in Brazil where polyethylene will be made from sugar cane. And finally, we are preferentially investing in other parts of the world where energy costs are considerably lower. In fact, Dow has announced projects in Brazil, China, Kuwait, Libya, and Saudi Arabia. These investments will create 10,000 direct and 60,000 indirect jobs. Many of these jobs would have been created here in the U.S. but for the high and volatile cost of natural gas.

We believe natural gas is of greatest value as a raw material for value-added products. At Dow, we turn $10 billion worth of natural gas and natural gas liquids into $45 billion of value-added products each year. Chemistry creates wealth by converting precious resources like natural gas into value-added products essential to our way of life.

With additional proposed uses of natural gas, the industrial sector will become the shock absorber in the form of demand destruction. Demand destruction is a sterile economic term for job loss. In fact, with natural gas prices increasing more than 460 percent over the last 8 years, our country's manufacturing sector has lost 3.7 million jobs.

As our country becomes more concerned with energy security and reducing global warming, we run the risk of dramatically increasing demand for natural gas. As an example, natural gas in the power sector could ramp up dramatically under a climate change policy that does not rapidly deploy nuclear technology and carbon capture sequestration.

To prevent this, we recommend that Congress enact a comprehensive energy policy that addresses high prices, dependency on foreign sources of energy, and climate change. We believe this can best be accomplished by focusing on aggressive energy efficiency measures, increasing and diversifying domestic energy supplies, including more natural gas production, further developing alternative and renewable sources of energy, and passing environmentally effective and economically sustainable climate change legislation.

Recent proposals, such as the Pickens plan, have some positive elements, like increased wind and solar power generation. However, we are concerned that adding new uses for natural gas such as in transportation will create new and relatively inelastic demand that we may not be able to meet without high prices and further demand destruction in the industrial sector.

In conclusion, the U.S. needs a comprehensive, sustainable energy policy. Simply increasing demand for natural gas without addressing the supply issue is not a sustainable policy. It seems that members of Congress are talking past each other on energy policy. We need serious action on both supply and demand. It is a need that cries out for bipartisan solutions.

I thank you for the opportunity to participate in today's discussion.

[The statement of Mr. Wells follows:]

The Dow Chemical Company

STATEMENT FOR THE RECORD

SELECT COMMITTEE ON ENERGY INDEPENDENCE AND GLOBAL WARMING

HEARING ON

What's Cooking with Gas: The Role of Natural Gas in Energy Independence and Global Warming Solutions
July 30, 2008

Submitted By:
Rich Wells
Vice President, Energy

The Dow Chemical Company appreciates the opportunity to submit these written comments to the Select Committee on Energy Independence and Global Warming.

Dow was founded in Michigan in 1897 and is one of the world's leading manufacturers of chemicals and plastics. We supply more than 3,300 products to customers in 175 countries around the world, including hundreds of specialty chemicals, plastics, agricultural and pharmaceutical raw materials for products essential to life. About 21,000 of Dow's 46,000 employees are in the US, and Dow helps provide health benefits to more than 34,000 retirees in the US.

Dow is committed to sustainability. We have improved our performance on greenhouse gas (GHG) emissions, and we are committed to do even better in the future. Our ambitious 2015 sustainability goals underscore this commitment. (See the Appendix for more details.)

Dow is an energy-intensive company. Dow uses energy, primarily natural gas and natural gas liquids, as a feedstock material to make a wide array of products essential to our economy and quality of life. We also use energy to drive the chemical reactions necessary to turn our feedstocks into useful products, many of which lead to net energy savings.

This testimony describes the current US energy crisis and recommends specific policies to ensure a sustainable energy policy for the United States. Particular attention is focused on natural gas prices, which have and continue to adversely affect the US manufacturing sector.

Natural Gas and the US Chemical Sector

Before turning to policy issues, it is important to first understand the role that natural gas plays in the chemical sector.

Natural gas from the wellhead is processed to produce methane and natural gas liquids (NGLs). NGLs, also called liquefied petroleum gases, include ethane, propane, and butane and can be produced via natural gas processing or through petroleum refining. Petroleum refining yields a number of products, including NGLs and naphtha. Naphtha and NGLs are processed in large vessels, or crackers, in which the materials are heated and pressurized to crack the hydrocarbon chains into smaller chains. The smaller chain hydrocarbons include olefins (ethylene, propylene, and butylene) and aromatics (benzene, toluene, and xylenes). These petrochemical feedstocks serve as the building block materials for plastics, pharmaceuticals, electronic materials, fertilizers, and thousands of other products.

Total energy consumption by the chemical industry in 2007 was 6.17 quads (quadrillion BTUs), which represented about 6.2% of total US energy consumption. Of this amount, 55% is from natural gas (NG or NGLs).

The industry uses 1.93 trillion cubic feet (TCF) of natural gas annually, representing 8% of US natural gas consumption. The majority of steam boilers and cogeneration units in the manufacturing sector are powered by natural gas. The remainder is for feedstock purposes. Due to the historic abundance and low cost of natural gas in the USA, natural gas has been vital to domestic chemical production.

As a major chemical producer, Dow purchases natural gas and NGLs for use as (1) feedstock material, and (2) fuel and power. Approximately 80% of our hydrocarbon and energy purchases are for feedstock material. Dow is one of the largest industrial users of hydrocarbons, consuming the equivalent of 850,000 barrels of oil every day in energy and hydrocarbon feedstocks.

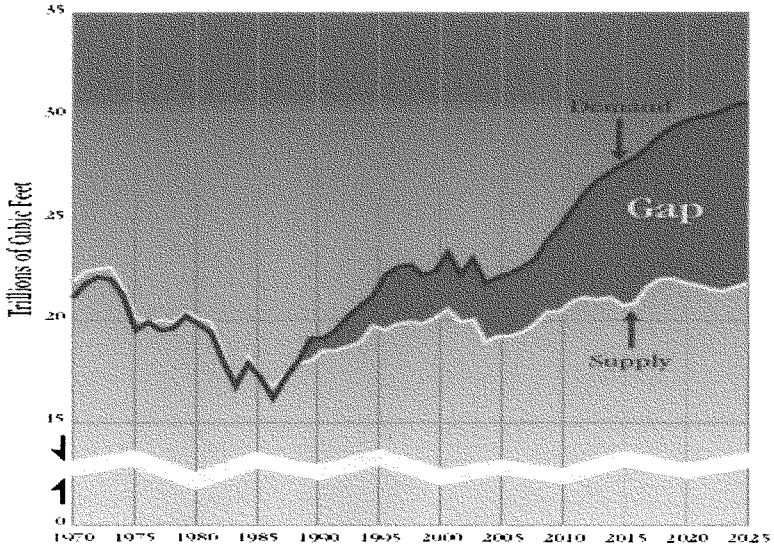
In the chemical sector, energy represents a significant share of production costs. For some chemicals, it can be as high as 85%. For Dow, energy costs in 2008 are expected to equate with about half of our total revenues. Energy represents, by far, the fastest growing segment of our production costs.

Impact of High US Natural Gas Prices

To understand the reason for high natural gas prices, it is important to understand supply and demand trends. Natural gas currently represents about 23% of US energy consumption. In 2005, US natural gas demand was 22 trillion cubic feet (TCF) per year, which was higher than US supply. By 2030, US natural gas demand is expected to grow over 30 TCF. The deficit between domestic supply and demand has been growing, and is expected to grow in the future. This demand/supply gap is driving higher prices.

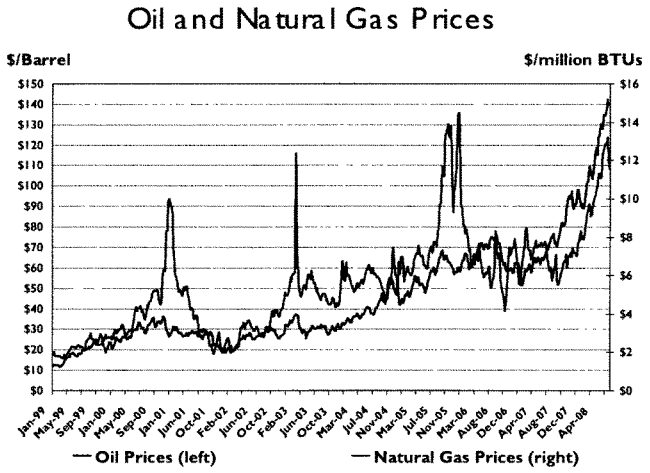
Today, the demand/supply gap is filled through a combination of imports of LNG and pipeline supplies from Canada. But Canadian natural gas is being used in ever-increasing amounts in the recovery of oil from oil sands. This decreases the amount of natural gas available for export to the United States. This will increase US dependence on liquefied natural gas (LNG) and will increase our dependence on foreign sources of energy.

Worsening Gap Between Domestic Natural Gas Supply and Demand



Although much attention is focused on the increase in the price of oil, natural gas has also seen significant price increases. Natural gas prices skyrocketed over 460% over the last eight years (Figure 1), and this price increase has significantly contributed to the US manufacturing sector losing over 3.7 million jobs, the chemical industry losing nearly 120,000 jobs, and the permanent loss of nearly half our fertilizer production capacity. The manufacturing sector, which has limited fuel switching ability, has become the shock absorber for high natural gas costs. America's farm sector is also being weakened by constraints on domestic natural gas development, even as global demand for food is growing. For the forest products industry, energy is the third largest manufacturing cost—up fifty percent in the last couple of years for pulp and paper mills. For some mills, the cost has eclipsed employee compensation.

Since 2001, high US natural gas prices have hurt the competitive position of U.S. manufacturers, who now operate in a predominantly domestic market. Exports of US manufactured goods are no longer competitive (i.e., imports greater than exports), even with the currently low value of the US dollar. For companies with global market share ambitions, overseas manufacturing bases are the only option. Meanwhile, consumers are paying more for electricity, home heating, gasoline, diesel fuel, and food. Today, many of the nation's homeowners are having difficulty paying their natural gas heating bills.



Source: EIA

Dow first expressed alarm about high natural gas prices in 2002. At that time, our total annual energy and feedstock bill was $8 billion. Today we are projecting our 2008 costs to be about $8 billion per quarter. At this level, our energy expenditures are by far the largest component of our production costs, and equate to about half of our total revenues.

Due to the unprecedented run-up in oil and natural gas costs, we recently increased prices by up to 45 percent in order to maintain margins and continue to invest in our future. These increases will be reflected in the prices consumers pay for everything from trash bags and diapers to shampoos and detergents, food, building materials, and other products.

Our recent price increases were needed just to keep pace with spiraling costs. We are aware of the impact this ultimately has on the consumer. But in the first three months of this year, our feedstock and energy costs climbed 42%, while our total costs increased by 22%.

The rising costs incurred by the manufacturing sector, whether the result of higher-priced feedstocks and energy, government imposed tariffs or tougher regulations, will ultimately be borne by the consumer.

Most petrochemical production can occur in areas of the world where natural gas prices are low—such as the Middle East—and landed in the US at the natural gas equivalent price of $4 to $4.50/MMBtu. The current US price of natural gas is over $10. This is the basic indicator of competitive disadvantage our industry faces.

The U.S. domestic market continues to provide significant domestic business opportunity. We may be building a tremendous business overseas, but we also have a very good business here – albeit domestically focused – that we want to keep and grow. We want to invest in the U.S., but there must be an appropriate value proposition. Dow sales inside the United States remain by far the largest for any country – almost 3.5 times its nearest rival, Germany. But consider this: five years ago (2002) U.S. sales outstripped those of second place Germany by a factor of almost 6.5 to 1. Today, more than two-thirds of Dow's sales are generated outside North America.

Coping with High Energy Prices

Because of high energy costs, Dow has had to take a number of actions to remain viable as a company. We have focused relentlessly on improving our energy efficiency, shut down dozens of uncompetitive plants, pursued alternative energy and feedstocks, and invested preferentially in parts of the world where energy costs are lower.

Our strategy is two-fold. In the short term, we are controlling the things that we can control, including a sharp focus on energy efficiency. In the long term, we're building a portfolio of joint ventures with access to low-cost feedstocks and are dedicated to innovation breakthroughs in the areas of renewable and alternative energy and feedstocks.

Energy Efficiency

The Dow Chemical Company is a recognized industry leader in energy management. Energy efficiency has been part of our heritage since the very early years of our company, when Dow helped pioneer the use of industrial combined heat and power, also known as cogeneration. In conventional power plants, a significant portion of the energy is lost (usually through cooling towers or flue gas) in the process of electricity generation. In contrast, cogeneration captures more of the heat, utilizing less fuel, which has a significant impact on greenhouse gas emissions and improved air quality relative to conventional utility power. Cogeneration typically uses 20% to 40% less fuel than separate steam and power generation because energy is captured and used that would otherwise be wasted.

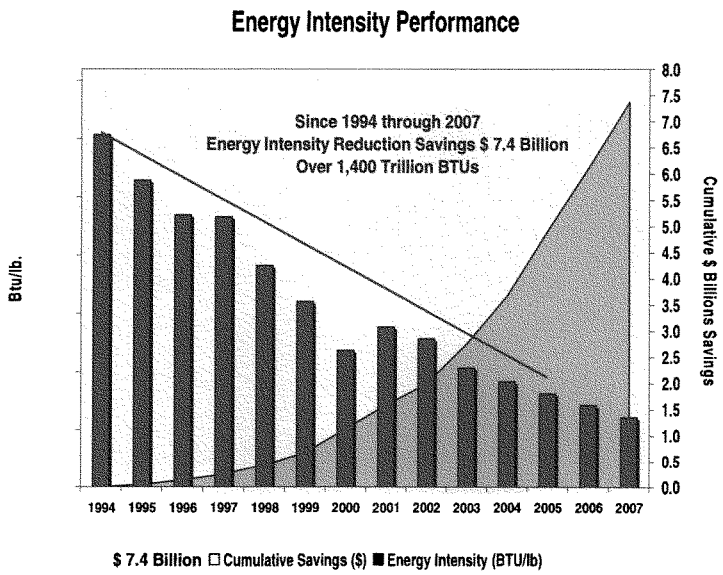
In recent years, through a companywide focus on energy efficiency, we have dramatically increased our energy efficiency -- and exceeded an aggressive, long-term corporate energy efficiency goal. Since 1994, we have reduced our energy intensity 24% worldwide. Our cumulative energy savings have reached approximately 1,400 trillion BTUs, and we have avoided about 74 million tons of carbon dioxide emissions. Figure 1 shows how our $1 billion investment in energy efficiency has returned more than $7 billion in energy savings. We are very proud of the fact that EPA has recognized Dow as their 2008 Energy Star "Partner of the Year".

Dow's experience in energy efficiency has convinced us that we can help others realize these benefits, too. Indeed, energy efficiency is a universal tool. It should be the tool of

choice, irrespective of whether one's motivation is to save money, reduce GHG emissions, or reduce dependence on foreign energy. It is the cheapest and most renewable "fuel" of all.

To illustrate the benefit of energy efficiency, if the entire US economy was to adopt Dow's goal of increasing its energy efficiency by 25% from 2005 to 2015, then we would reduce the oil equivalent of 100% of our imports from the Persian Gulf.

Dow is also working with the UN Foundation and The Alliance to Save Energy to promote energy efficiency worldwide. A recent report from the UN Foundation concluded that doubling the annual rate of energy efficiency improvement to 2.5 percent in the G8 +5 countries would contribute to holding CO_2 levels in our atmosphere to a manageable level for the rest of the century.



Dow is working with Lawrence Berkeley National Labs and China's Energy Research Institute to improve the energy efficiency of small- and medium-sized companies in China.

Dow supports government and other organizations in their efforts to promote energy efficiency among all consumers. Dow was a major sponsor of The Alliance to Save Energy's "The Power is in Your Hands" energy efficiency campaign, designed to help

U.S. energy consumers save money and energy. Dow is also an active participant in the U.S. Department of Energy's "Save Energy Now" industrial energy efficiency campaign.

Dow is also working with the national Association of Manufacturers (NAM) to promote energy efficiency best practices to thousands of US companies.

Innovation

Dow has been a leading advocate of solutions that ensure fuel and feedstock diversity. Dow is devoting a significant R&D effort to the discovery of less energy- and carbon-intensive routes to our key high-volume chemical feedstocks, ethylene and propylene. Accelerating the utilization of innovative technologies — those that advance more efficient hydrocarbon production and reduce the environmental impact of its production and use — is a priority.

We are making significant financial investments in R&D to achieve breakthrough solutions that will help slow, stop and reverse emissions of greenhouse gases.

We are developing greener, more diverse fuels and feedstocks based on renewable and alternative sources of energy. For example, Dow and the U.S. Department of Energy's National Renewable Energy Laboratory (NREL) recently announced an agreement to jointly develop and evaluate a process that will convert biomass to ethanol and other chemical building blocks. A mixed alcohol catalyst from Dow is seen as the key to unlocking the potential for this promising renewable energy resource. The process will use non-food ingredients, such as the leaves from a corn plant or wood wastes, and convert the bio-based material through a gasification process to synthesis gas. Dow's technology helps convert the synthesis gas into a mixture of alcohols including ethanol that can be used as transportation fuels or chemical building blocks.

Dow is investing more than $100 million in research and development for solar photovoltaics integrated in building materials such as roofing shingles and siding. Dow is committing to using its knowledge of materials science, processing, and component design to develop integrated solar photovoltaic systems at a cost of less than $0.06 per watt that is at grid parity from a cost perspective with a manufacturing capability of 100 megawatts. This represents a three-fold reduction from the cost in 2005.

Alternative Feedstocks

Because of the expense and environmental footprint associated with fossil energy, Dow is actively investigating and moving forward on alternate feedstock materials such as:

- Sugar cane to polyethylene for use in boat hulls, bathroom fixtures, and antifreeze.
- Glycerin to propylene glycol for use in pipes, films, and food packaging.
- Soy to polyols used in foam cushions and carpet backing.
- Coal to chemicals/polygeneration with effective carbon management.
- Coal/petcoke gasification to natural gas with effective carbon management.

For example, we recently announced a joint venture in Brazil to produce polyethylene from sugar cane ethanol. The new process will produce far less CO_2 than the traditional process.

Energy Saving Products

Dow, like many other U.S. manufacturers, already provides energy-saving products that will help consumers reduce their energy bills and reduce GHG emissions. Examples include the following:

- For the home or business, our products include STYROFOAM brand insulation and GREAT STUFF polyurethane foam sealants. Such solutions can reduce home and business energy costs by 20%-30%.

- For saving energy on the road, we've developed a new diesel particulate filter technology within Dow Automotive, enabling improved environmental performance and fuel efficiency.

- We also offer plastics, composites, and adhesives to help make cars stronger and lighter, while improving overall gas mileage. According to the U.S. Department of Energy, for every 10% reduction in weight, fuel economy improves by 7%. Plastics-enabled solutions include BETAFOAM™ structural foams that enhance vehicle structural integrity while allowing for down-gauging of steel and BETAMATE™ structural adhesives that decrease vehicle weight by reducing or eliminating welds and mechanical fasteners. Another Dow offering that helps car manufacturers reduce vehicle weight is MAGNUM™ ABS resins for light-weight exterior and interior components.

- For the industrial sector, Dow has been down-gauging industrial stretch film (PE), which will save 37 trillion BTUs per year (industry-wide), equivalent to 293 million gallons of gasoline. Down-gauging is the process of making a plastic film thinner but stronger, so that less plastic can be used while getting the same benefits in use.

Need for a Sustainable Energy Policy

No company in the world is more intensely aware of the need to reinvent our dependence on oil and natural gas than Dow. We will lead the way on energy transformation because we have to. And we have taken important steps already.

But private sector actions alone cannot solve the problems posed by high natural gas prices. Government leadership is also necessary. Congress can do its part to develop a sustainable energy policy for the United States, one that addresses the triple threat of high energy prices, rising energy dependence, and global warming. A sustainable energy policy is one that relies on aggressive energy efficiency, diversification and expansion of

domestic energy supplies, cost-effective controls on greenhouse gas emissions, and long-term incentives for development of breakthrough technologies.

We have developed a list of specific policies that, if implemented, would form the basis of a sustainable energy policy.

First, aggressively promote the cleanest, most reliable, and most affordable "fuel"—energy efficiency. Energy efficiency is the consensus, first-step solution to each of the three problems identified previously. It is often underappreciated for its value. Of particular importance is improving the energy efficiency of buildings. Buildings are responsible for 38% of CO2 emissions, 40% of energy use, and 70% of electricity use. A combination of federal incentives and local energy efficiency building codes is needed.

Second, increase and diversify domestic energy supplies, including natural gas. The United States is the only country with abundant domestic supplies that restricts deep water natural gas exploration. Nuclear energy and clean coal with carbon capture and sequestration (CCS) should also be part of the solution, as should solar, wind, biomass, and other renewable energy sources.

An estimated 86 billion barrels of oil and 420 trillion cubic feet of natural gas are not being tapped. (History suggests that the more we explore, the more we know, and the more our estimates of resources grow. EIA has said that "the estimate of ultimate recovery increases over time for most reservoirs, the vast majority of fields, all regions, all countries, and the world.") And we have the technology that allows us to produce both oil and natural gas in an entirely safe and environmentally sound manner. Any new fossil energy resources must be used as efficiently as possible.

One way to maximize the transformational value of increased oil and gas production is to share the royalty revenue with coastal states and use the federal share to help fund research, development and deployment in such areas as energy efficiency and renewable energy. Production of oil and gas on federal lands has brought billions of dollars of revenue into state and federal treasuries. Expanding access could put billions of additional dollars into state and federal budgets.

Third, act boldly on technology policy through long-term tax credits, and increased investment in R&D and deployment. These are costly but necessary to provide the certainty that the business community needs to spur investment. We didn't respond to Sputnik with half-measures. We can't afford to respond to our energy challenges with half-measures, either.

Fourth, employ market mechanisms to address climate change in the most cost-effective way. There is a need for sharp, firm, and direct action now to dramatically slow, stop, and then reverse the growth of greenhouse gas levels in the atmosphere. We concur with the principles and recommendations of the US Climate Action Partnership (USCAP), of which Dow is a proud member. And we recognize that concerted action is needed by the rest of the world to adequately address this global problem.

Recent Proposals

Our current crisis has spurred evaluation of potential solutions. Most recently, The Pickens Plan proposes to reduce US dependence on foreign oil by harnessing domestic energy alternatives such as wind, solar, and natural gas. Specifically, the plan involves building new wind electric generation facilities and greatly increasing the use of natural gas as a transportation fuel. The goal is to reduce US reliance on foreign sources of oil.

We appreciate the fact that Congress is considering energy proposals that are large-scale and that would begin soon. We also support Mr. Pickens' five principles for US energy policy: (1) We must slash US dependence on foreign oil by at least 30% in 10 years. (2) We must rely 100% on domestic resources. (3) We must use existing, proven, and workable alternatives to foreign oil. (4) We must call on private enterprise to execute the plan quickly. (5) The federal government should clear a path for implementation. In our opinion, these principles are sound.

However, we have concerns about the specifics of the Pickens Plan. First, we would like to clarify some important facts. Currently, natural gas is cheaper than oil. This, however, is not always true. In fact, on average, from January 2003 through December 2005, natural gas was almost exactly at parity with oil (natural gas was 1% cheaper over this time period). Just as importantly, the volatility of natural gas is much higher than that for oil. During one three-month period, natural gas went from being 25% more valuable than oil to 50% less valuable.

Mr. Pickens has stated that natural gas is priced favorably when compared to oil. We would point out that both coal and nuclear are much cheaper than either natural gas or oil.

Our biggest concerns with the Pickens Plan are that it would (1) increase the volatility of energy prices and (2) harm the US manufacturing sector.

To see why it would increase volatility, consider that you can't use solar power if it's cloudy, or wind power if it's calm. So, the country would have to build more "peaking-only" electric power plants. To pay for these units (which would sit idle most of the time), the price of peak power would have to rise dramatically. If these prices were passed directly to consumers, we might save a lot of gas over time as people would cut back demand. The likely result, however, is that we have to pay traders and utilities to manage increased volatility; consumers would see the increased cost only slowly.

In recent testimony before Congress, Mr. Pickens said, "It's not our job to provide cheap gas to the chemical industry. They're going to have to compete globally." Fundamentally, this statement is correct. The only issue is that many other countries offer the chemical industry energy at below LNG prices precisely because they realize that the jobs provided are valuable, and the diversification of the economy provides a more steady revenue stream than relying on energy alone.

For the business of chemistry, our next best alternative is not LNG, as Mr. Pickens suggests, but rather long-term fixed-price natural gas at attractive prices in other regions of the world. We can then move the plastic or chemicals produced to local markets (helping the country grow) or create export currency for these countries by serving the world's growing markets. These products are much cheaper to move than LNG, so the world creates value by turning ethane into chemicals.

We do not wish to be overly critical of the Pickens Plan. As stated previously, we support the five principles that Mr. Pickens used as the basis for his plan. There are, however, other plans that follow Mr. Pickens' principles but without increased volatility and without harming the US manufacturing sector. For example, a combination of more efficient use of gasoline engines (higher fuel economy), and more clean coal, nuclear, and renewables would be a better plan. If we built a smart electric grid which could optimize charging plug-in electric vehicles when power was available from base-load power (i.e. new clean coal or nuke) or could take advantage of the wind/solar power if available, then plug-in vehicles could greatly reduce the reliance on oil while simultaneously reducing the volatility of power prices. We would in effect, build an interruptible source of energy which could store solar/wind power in a usable form while not creating a huge need for additional peaking power. The key is the smart grid and the increased base-load power from coal and nuclear. In this scenario, we should also increase home energy efficiency, and by so doing would free up base-load power for plug-in hybrids.

Recently, Rep. Emanuel and Senator Inhofe separately announced legislative initiatives to increase the use of natural gas as a transportation fuel. The Emanuel proposal would compel automakers to make sure 10% of their fleet vehicles run on natural gas by the year 2018. The bill would also include incentives and tax credits to add natural gas pumps at 20,000 fueling stations. Senator Inhofe's bill, S.3281, would promote natural gas as transportation fuel without any mandatory targets through tax credits, changes to the renewable fuels standard, and a new R&D program.

Aside from these proposals, there are campaigns underway to promote natural gas-fired power plants and oppose traditional, coal-based power plants because of the global warming implications. Like the Pickens plan and the proposals from Rep. Emanuel and Senator Inhofe, these campaigns would have the effect of increasing demand for natural gas.

Dow is pleased to see Members of Congress develop and consider proposals that could improve our nation's energy security and help reduce greenhouse gas emissions. These proposals represent a serious contribution to the debate. These proposals could, however, increase net demand for natural gas, which will raise US prices to ever higher levels, forcing manufacturers to compete with yet another sector of the economy, and add to the burden of residential homeowners.

Manufacturers have seen their competitive position weaken as US natural gas prices increased over the past few years. Policies that increase natural gas demand will make this already bad situation even worse. For example, policies that mandate corn-based ethanol will increase demand for natural gas. One billion gallons of ethanol require the

use of 28 billion cubic feet of natural gas. Another example is climate change legislation. Natural Gas Council models predict that pending climate change legislation will increase natural gas demand by as much as 10 TCF per year.

Congress has been enticed into over-reliance on natural gas before. The Clean Air Act Amendments of 1990 were enacted with the belief that natural gas would be the clean fuel of the future and would be cheap and plentiful for as far as the eye could see. Unfortunately, Congress did not anticipate the run-up in natural gas prices and the resulting demand destruction in the industrial sector.

Before we repeat this mistake and consider creating new demand for natural gas, we need to (1) address the need for more domestic supply and (2) reduce the growth of natural gas in power generation.

Conclusions

Since 2001, high US natural gas prices have hurt the competitive position of U.S. manufacturers, who now operate in a predominantly domestic market. Exports are no longer competitive. For companies with global market share ambitions, overseas manufacturing bases are the only option.

Meanwhile, consumers are paying more for electricity, home heating, gasoline, diesel fuel, and food. Today, many of the nation's homeowners are having difficulty paying their natural gas heating bills.

No company in the world is more intensely aware of the need, ultimately, to reinvent our dependence on oil and natural gas than Dow. We will lead the way on energy transformation because we have to. And we have taken important steps already.

Dow supports a sustainable energy policy. Such a policy would promote energy efficiency; increase domestic supplies of energy, including natural gas; act boldly on technology policy through long-term tax credits, and increased investment in R&D and deployment; and employ market mechanisms to address climate change in the most cost-effective way.

Before we consider creating new demand for natural gas in the transportation sector, we need to (1) address the need for more domestic supply and (2) reduce the growth of natural gas in the power sector. Increasing net demand for natural gas is not a sustainable policy.

Appendix—Dow's Progress and Commitment To Reduce Its Climate "Footprint"

Dow accepts the Intergovernmental Panel on Climate Change (IPCC) conclusion that it is very likely that human activities are causing global warming. We recognize the serious nature of the threat and that it warrants bold action with clear, long-term performance objectives.

We understand that it is not enough to agree with consensus scientific opinion. Our commitment to sustainability requires that we act upon such information responsibly and swiftly. To that end, Dow has made considerable progress in reducing its climate "footprint":

- From 1995 to 2005, in keeping with its publicly announced sustainability goals, Dow reduced its energy intensity (BTU per pound of product) by 22%, resulting in energy saving of 900 trillion BTUs, which is enough to power all the homes in the entire state of California for a year.
- Since 1990, Dow reduced its absolute greenhouse gas (GHG) emissions since to a level that exceeds Kyoto targets. Overall, emissions of Kyoto GHGs were reduced by more than 20% during this time period.
- GHG emission reductions achieved through the use of Dow products more than offset the GHGs produced during the manufacture of those products.

Although this record is positive, we are committed to continued improvement and reduction of our environmental footprint. In order for Dow to contribute even more to climate change solutions, we have developed a clear vision and key milestones for the years 2015 and 2025. Our vision will guide our decisions today and into the future, and based on this vision, we pledge to reach a number of far-reaching objectives:

- Our vision is to have contributed to the achievement of a world in carbon equilibrium, a target described by Princeton University professors Robert Socolow and Stephen Pacala in the September 2006 edition of *Scientific American*. We will have set the industry benchmark through our own performance. We will apply our innovation and expertise to help solve the world's GHG and energy challenges.

- Our key milestones:

  - By 2015, Dow will reduce its energy intensity by another 25% compared to base year 2005.
  - By 2015, Dow will reduce its GHG emissions intensity (tons of CO_2 per pounds of production) 2.5% per year.
  - By 2025, Dow will stop the growth of absolute emissions of GHG within the company. Our absolute emissions will remain below the 1990 baseline, and we will begin on a journey of year-over-year reduction in GHG emissions.
  - By 2025, Dow aims to have non greenhouse gas emissive energy provide at least 400 MW equivalents, or 10% of Dow's global electrical demand

- By 2050, at least 50% of the energy consumed by Dow globally will be non-carbon emitting.

The CHAIRMAN. Thank you, Mr. Wells.

Our final witness is Mr. John German, the manager of environmental and energy analysis for the American Honda Motor Company. Honda is the only company currently offering a compressed natural gas passenger vehicle, the Civic GX, in the United States. Since its introduction in 1998, both EPA and the American Council for Energy Efficient Economy have ranked it as one of the greenest cars in America.

We welcome you, Mr. German, and we look forward to your presentation. We will just wait a second here so you can get your props set up.

Mr. GERMAN. I am taking a page out of your book, Mr. Chairman. [Laughter.]

The CHAIRMAN. I think it has already got my attention. I like props. We have a little bit of an obstructed view there. If you can pull that out a little bit further. All right. Beautiful. Thank you.

So Mr. German, please begin.

STATEMENT OF JOHN GERMAN

Mr. GERMAN. Okay, thank you.

Mr. Chairman and members of the committee, good afternoon. I appreciate the opportunity to appear today to discuss Honda's work with natural gas. I request that my full statement be submitted for the record.

Honda believes there is no single solution to America's dependence on petroleum and global warming. As a result, we are dedicated to advancing and implementing a variety of fuels and technologies. Our objective is to introduce technologies that lower emissions, improve energy conservation, and increase fuel economy, while meeting the needs of our customers and of society.

One such technology is our dedicated natural gas vehicle, the Civic GX. It is the only natural gas vehicle produced or sold in America. Natural gas offers significant benefits when used as a transportation fuel, as it operates cleanly and efficiently in internal combustion engines and works in a variety of vehicle applications. Natural gas also has low upstream emissions and a lower ratio of carbon-to-energy output than petroleum, which reduces greenhouse gas emissions.

First introduced in 1997, the GX is produced at Honda's Liberty manufacturing plant in Ohio. It has been called the cleanest vehicle ever tested by the USEPA. Historically, our sales have been between 500 and 1,000 vehicles per year, but Civic GX demand is now at an all-time high and the market is growing due to the combination of high gasoline prices, concerns about energy security, and the introduction of a home refueling station.

The price of the Civic GX is approximately $25,000, which is about $7,000 more than a comparable gasoline engine Civic. Part of this price differential is offset by a federal tax credit of up to $4,000. The price premium, due primarily to the increased expense of key components such as the special tank and fuel system, could be lowered somewhat by increased volume. The GX has a range of up to 220 miles and an eight-gallon gas equivalent fuel capacity.

Compared to plug-in hybrids, fuel cell and battery electric vehicles, the cost increment for gasoline—I am sorry—the cost incre-

ment for natural gas vehicles is much less. Due to infrastructure constraints, Honda's initial market for the Civic GX was fleets. However, with the development of a home refueling device known as PHILL, Honda has begun to market the vehicle to retail customers. PHILL, which is illustrated up here, that is a full-size photo, taps into the consumer's residential natural gas line, connects to the vehicle and fills the tank overnight.

We have found that the convenience of home refueling is a major attraction to many customers. Mile for mile, natural gas is much less expensive than gasoline, particularly at residential rates. Every gallon-equivalent of natural gas displaces one gallon of gasoline and cuts CO_2 emissions by about 25 percent.

Honda's experience with natural gas vehicles also serves as a pathway to hydrogen fuel cell vehicles. The physical properties of hydrogen and natural gas are similar and so are many of the components. Natural gas being the base fuel in many cases for producing hydrogen, Honda is testing an innovative home energy station that generates hydrogen from natural gas. Honda's home energy station, developed in cooperation with Plug Power of New York, makes efficient use of a home's existing natural gas supply for production of hydrogen, while providing heat and electricity to the home.

Our fourth generation station is currently deployed at our Torrance campus and is used to fuel the Clarity, our new fuel cell vehicle. Incidentally, last week Honda leased its first Clarity to a retail customer in California. We will be releasing 200 additional Clarity vehicles to individuals over the next several years at the rate of $600 per month for 36 months.

Honda also makes a micro combined heat and power system for the home. This is the freewatt system illustrated on the other one. It is a home natural gas cogeneration unit that produces about one-third less carbon dioxide emissions than a conventional heating system, with electricity provided from the grid. The product is marketed in New England and sold through a joint venture known as Climate Energy. The system combined two technologies: an advanced furnace provided by ECR of Utica, New York, and a natural gas-fired generator produced by Honda. Economic viability of the system would be further increased if the electric grid could accept excess electricity generated by freewatt.

Our energy and global climate challenges are so immense we are going to need rapid deployment and implementation of as many feasible technologies as possible. Although supplies of natural gas are not unlimited, natural gas vehicles are one of a number of important near-term technologies.

Natural gas may also be a core fuel for what may be our best long-term technology, fuel cell vehicles with hydrogen extracted from natural gas.

This concludes my statement. I would be happy to answer any questions.

[The statement of Mr. German follows:]

Statement of John German
Manager, Environment and Energy Analysis
American Honda Motor Co., Inc.

Before the

Select Committee on Energy Independence and Global Warming

U.S. House of Representatives

July 30, 2008

Mr. Chairman, good morning. My name is John German, Manager, Environmental and Energy Analyses, American Honda Motor Co., Inc. Thank you for the opportunity to appear before the House Select Committee on Energy Independence and Global Warming to present our views on the benefits of natural gas vehicles (NGV), the state of the NGV market and the role that natural gas vehicles should play in developing a comprehensive plan for solving our energy and climate change challenges.

Background

Development of a variety of technologies is accelerating in response to serious concerns about dependence on petroleum, energy security and global warming. Global demand for transportation energy is extensive and, as a result, no single technology can possibly be the solution. There are no simple obvious solutions – we are going to need rapid development and implementation of as many feasible technologies as possible. Honda is developing technologies that meet both the needs of our customers and those of society. We, at Honda, are constantly exploring a variety of technologies to achieve energy sustainability.

Honda has a long-standing track record of introducing technologies to lower emissions, improve energy conservation, and increase fuel economy. When Honda engineers sought to develop a near zero emissions internal combustion vehicle in the early 1990's, natural gas was recognized as the logical clean burning fuel for a variety of reasons:

- Hydrocarbon emissions from the engine are very low relative to gasoline powered vehicles. Natural gas is already a gas, so it mixes better with air and helps to eliminate byproducts and unburned hydrocarbons in the combustion process. Also, enrichment of the fuel is not needed during cold starts.
- The hydrocarbons that are emitted are mostly CH4, which has extremely low photochemical reactivity and therefore has little impact on air quality.
- Natural gas requires a sealed fuel storage and delivery system, so it has no evaporative emissions.
- Compressed natural gas has extremely low upstream emissions and little impact on air quality throughout the fuel manufacturing and distribution cycle.

- Natural gas has less carbon content than petroleum, and thus lower CO2 emissions.
- Dedicated natural gas vehicles can operate at higher compression ratios for better efficiency and lower CO2 emissions.

Honda developed a dedicated natural gas vehicle, our Civic GX, that addressed some of the limitations of earlier alternative fuel vehicles (e.g. performance and range), and aimed to contribute to U.S. energy policy goals with an alternative fuel vehicle that displaced petroleum and diversified the energy mix used for transportation. Natural gas offers significant benefits, as it operates cleanly and efficiently in internal combustion engines and works in a variety of vehicle applications (from buses and trucks to small cars). It also has a lower ratio of carbon to energy output, reducing greenhouse gas emissions. In other parts of the world, compressed natural gas vehicles are a mature industry where the technology is widely adopted and well understood. Thus, there is a worldwide supply of compressed natural gas components, although Honda is sourcing some key components for the Civic GX in the U.S., including the storage tank.

Civic GX

Honda is the only OEM vehicle manufacturer that currently offers a dedicated compressed natural gas passenger vehicle, the Civic GX, for the U.S. market. First introduced in 1997, the GX is produced at Honda's East Liberty motor vehicle manufacturing plant in Ohio. The Civic GX has a 4-cylinder, 16 valve i-VTEC engine with an eight gasoline gallon equivalent (gge) fuel capacity. The GX has a range of up to 220 miles. Federal tax incentives up to $4,000 currently exist for the Civic GX. Non-financial incentives such as HOV lane access under federal law and in some cases, special parking privileges under state or local laws are also available. Historically, sales have stayed between 500 – 1000 vehicles on an annual basis. However, Civic GX demand is now at an all-time high and the market is growing due to the combination of high gasoline prices, concerns about energy security and the introduction of a home refueling station.

Recognized for its very low emissions, the Civic GX achieves near zero smog emissions. It was the first internal combustion vehicle to meet the requirements for the stringent California Air Resources Board's (CARB) light-duty super ultra-low emissions vehicle (SULEV) and for the advanced technology partial zero emission vehicle (AT-PZEV). The GX achieves the EPA's inherently low emissions vehicle (ILEV) status, and at its launch in 1998 was lauded by the Environmental Protection Agency as the "Cleanest Internal Combustion Engine on Earth." Today, the Civic GX remains at the top of the American Council for Energy-Efficient Economy (ACEEE) Greenest Car listings, as it has for every year since the ACEEE began rating vehicles in 1998.

The price of the Civic GX is approximately $25,000, which can be more than a comparable gasoline engine car. The Civic GX comes with all of the attributes consumers expect and desire in today's vehicles (6 air bags, anti-lock brakes, air conditioning, etc.). The price premium, due primarily to the increased expense of key components such as specialty tanks and fuel systems, could be lowered with increased

volume. However, when compared to plug-in hybrid electric vehicles, fuel cell vehicles and battery EVs, the cost increment for natural gas vehicles is much less. Electricity from the U.S. grid on a well-to-wheel basis has significant greenhouse gas and air quality emission consequences. Several well-to-wheel analyses show natural gas vehicles with superior benefits compared to plug-in hybrid electric vehicles. (See Appendix A).

Home Refueling – Phill™

Despite challenges in marketing the Civic GX to fleets, Honda has stayed the course and recently began a more aggressive effort to market the vehicle to retail customers with a home-refueling option. The natural gas home-refueling station, called Phill™, was developed by fuel makers with Honda's assistance. It taps into the customer's residential natural gas line, connects to the vehicle and fills the tank overnight. It automatically shuts off when the tank is full. All that is needed for installation is a utility supplied natural gas line and a dedicated electrical outlet. The Phill™ expands the refueling opportunity for natural gas beyond what is possible with petroleum fuels, taking advantage of widespread natural gas supply network to homes. Our customers typically refuel at night, so that the small electric use for operating the home refueling device occurs in the off-peak, overnight period, which is another plus. The superior convenience of home-refueling is a major attraction to many customers. Customer feedback that Honda received during its electric vehicle efforts consistently lauded the benefits of the home-refueling option. The cost of Phill™ generally falls in the $4,000 to $5,000 range, plus installation. We expect this cost to drop with higher sales. There are also Federal tax incentives, up to $1,000 for the installation of a Phill™ device. Certain states offer additional incentives.

Nearly every alternative fuel has a major challenge with infrastructure – the so-called "chicken and egg" problem: no infrastructure until there are vehicles, no vehicles until there can be a robust infrastructure. The promise of home refueling tunnels through that problem and enables the infrastructure to grow with the vehicle on a one-to-one basis. Additionally, home refueling allows the public infrastructure to develop with less stress.

Natural gas use in medium and heavy-duty fleets has proven extremely successful in reducing greenhouse gas emissions and petroleum consumption. Light duty natural gas vehicles have the prospect of furthering those investments as well.

Mile for mile, natural gas is less expensive than gasoline, particularly at residential rates. The fuel cost gap between compressed natural gas and gasoline is now sufficient to refocus consumers on the need for alternatives. The cost of compressed natural gas can be as much as $3.00 less (home refueling at $1.00 to $1.50 compared with gasoline at $4.00 to $4.50). Every gasoline gallon equivalent of natural gas used displaces one gallon of gasoline and cuts CO2 emissions by 25%.

Biogas

Non-fossil and renewable methane gas (biogas) are being extensively studied and are promising alternative fuels. Producing fuels from cellulosic biomass would be much more efficient and environmentally friendly than producing ethanol from corn. However, fermentation of cellulosic feedstocks is much more difficult than fermenting corn and other food starches. Other methods of breaking down cellulose are also being developed and evaluated, such as pyrolysis and gasification. Gasification may well prove to be the best method of extracting hydrocarbons from cellulose.

Another method of producing biomass is already in use. As sewage and other organic material degrade in an oxygen-free environment, biogas consisting mostly of methane and carbon dioxide is produced. Its use as a vehicle fuel is currently limited, due to the extra cost and complexity involved to turn the biogas into a liquid fuel for use in conventional vehicles.

Biogas has the potential for major reductions in fossil fuel use and CO2 emissions. Using biogas directly in natural gas vehicles would save considerable expense and could help establish a viable market for gasification of cellulosic materials.

Pathway to Hydrogen

Natural gas and natural gas vehicles are also a pathway to hydrogen-fueled transportation. Many of the components in natural gas vehicles are similar, such as storage tanks, dispensers, and plumbing, as well as the physical properties of natural gas and hydrogen. Individuals who drive natural gas vehicles today will serve as the innovators of hydrogen tomorrow. Likewise, natural gas dealership service technicians and fueling station builders are the apprentices today for hydrogen tomorrow. In terms of emissions, fuel cell vehicle well-to-wheel CO2 emissions are reduced 60% when hydrogen is produced from natural gas. Greenhouse gas emissions are near zero when hydrogen is produced from renewables.

For Honda, our work with natural gas vehicles has been a great learning experience that can be applied to our efforts with hydrogen and our fuel cell vehicles. With natural gas being the base fuel in many cases for producing hydrogen, Honda is developing an innovative Home Energy Station (HES) that generates hydrogen from natural gas. The station produces heat and electricity for the home through fuel cell cogeneration as well as creating a supply of hydrogen for a fuel cell vehicle. Honda began work in 2003 on the Home Energy Station concept. Through research conducted in cooperation with technology partner Plug Power, Inc. of New York, refinements have been incorporated that made HES II and III more compact and convenient. The fourth generation HES design in operation at Honda's Torrance, California R&D center incorporates a stationary fuel cell stack innovation that can switch from hydrogen refining to power generation, helping to reduce size and improve efficiency. Such a system has the potential to allow

households to go off the electric grid during the (peak) day, or even provide energy to the grid.

Conclusion

Natural gas vehicles can and should be part of any comprehensive plan to reduce our nation's dependence on foreign oil while working to reduce harmful greenhouse gas and local air emissions. Dedicated natural gas vehicles offer the opportunity for a one-to-one reduction in petroleum use. Expanding the use of natural gas vehicles will be dependent on the product being cost competitive and expansion of infrastructure.

Although supplies of natural gas are not unlimited and it will never be the predominate fuel for vehicles, the energy and global warming challenges are so immense that we need to do everything we can. Recognizing the need to utilize all of the technologies available to us to achieve reductions in greenhouse gas emissions from the transportation sector, natural gas vehicles are one of those important near term technologies, especially if gasification of cellulosic feedstocks becomes available. Natural gas may also be a core fuel for what may be our best long term technology-fuel cell vehicles with hydrogen extracted from natural gas.

This concludes my statement and I would be happy to address any questions.

The CHAIRMAN. Great. That completes the time for the opening statements from the witnesses. I think we will have time for Mr. Sensenbrenner and for myself to ask questions, so I will begin, and then we will come back right after the roll call to recognize other members.

So the chair will recognize himself, and I am going to ask Mr. McClendon and Mr. Smith, you both mention in your testimony that U.S. natural gas production is up, while demand has remained relatively flat, but prices are still high, and many American families are already worried about paying for their heating bills this winter.

Will prices come down substantially as more and more of this natural gas goes into the system? And will expanded use of natural gas, as we have heard from Mr. Wells in the vehicles sector, have an impact on pricing for home heating purposes if there is that expanded demand part? Mr. McClendon.

Mr. MCCLENDON. Thank you, Mr. Chairman.

The first thing I would say is that gas production has actually been increasing for the last 3 years at a compounded rate of 6 percent.

The CHAIRMAN. Over the last 3 years?

Mr. MCCLENDON. Over the last 3 years on a compounded rate. Before then, for the last 5 or 6 years before, then gas production was flat to slightly declining. This year looks like we will have the industry's best year in modern history. We will be up probably 9 percent, and that is the equivalent of four or five tcf a day of new production in the U.S.

So do we have enough natural gas to meet all these new needs for natural gas? We see demand going up for natural gas for electricity. Certainly, it has become harder and harder to build a coal plant these days. It is difficult to build a nuclear power plant. Our view on that is simply that gas is there. It is clean. It is affordable and we think it ought to be used.

With regard to whether or not there is enough to fuel the automobile industry, right now if you were to move two million cars to natural gas, it would be about 1 percent of the U.S. car fleet. We think that would increase natural gas demand by about .75 percent. So the Emanuel-Boren bill seeks to increase the amount of cars in the U.S. that run on natural gas 10 percent. We think that that would require only about a 7.5 percent to 8 percent increase in demand for natural gas. Again, that is over 10 years, and in the context this year, our industry will increase production by 9 percent.

The CHAIRMAN. Can I talk for a second about using natural gas to generate electricity? We will have in some manner, shape or form legislation that passes here over the next couple of years that is a cap-and-trade system that puts some price on carbon. How much of these new discoveries can be used in order to make it possible to retire dirty old coal-generating plants, and as a result help us to meet whatever commitments the United States makes in the Copenhagen round?

Mr. MCCLENDON. Well, the American Clean Skies Foundation today released a study that had been performed by Navigant Consulting, which the authors of that report have concluded that over

the next 20 years, you could begin to retire the dirtiest of the coal-fired plants and not affect the price of natural gas, again because of the amount of production increase that we have.

The CHAIRMAN. Do you know how many megawatts they are talking about in terms of retired coal-fired plants?

Mr. MCCLENDON. I don't, but you have about 500,000 megawatts of installed power and use about 400,000 of it in——

The CHAIRMAN. On a daily basis.

Mr. MCCLENDON. Right. Most incremental megawatt——

The CHAIRMAN. So is it possible that 50,000 new megawatts of natural gas electrical generation, or 100,000 new megawatts of electrical generation is possible?

Mr. MCCLENDON. Right now, 20 percent of all electricity is made from natural gas, and that only consumes about 25 percent of natural gas in the U.S. So if you are increasing natural gas by 5 percent to 10 percent per year, you can add tens of thousands of megawatts a year and not impact.

The CHAIRMAN. So is it possible, in other words, to reduce from 50 percent the electrical generating capacity for coal in the United States, down to let's say 35 percent, and to increase the natural gas electrical generation from 20 percent up to 35 percent of our total needs, and as a result meet a big climate change goal that we would have?

Mr. MCCLENDON. Three years ago, I would have said no. Today, I say yes because of the technological breakthrough that has occurred in drilling for natural gas into these shale deposits.

The CHAIRMAN. So with the supply available, how long do you think it would take to make a transition like that?

Mr. MCCLENDON. I am not an expert in that. What I am an expert in doing is telling you that I believe that we can increase the supply of natural gas——

The CHAIRMAN. You are saying the supply will be there——

Mr. MCCLENDON [continuing]. By at least 5 percent per year. How the market decides to use that, whether it be for cars, whether it be for electricity, whether it be for more plastics and chemicals, I can't really comment on, but I think the surprise that I have for people today is that the technological breakthrough that we have developed in finding gas from shales changes everything about what you think about natural gas scarcity in America.

The CHAIRMAN. Thank you, Mr. McClendon.

Mr. Sensenbrenner is recognized.

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

As the chairman knows, I am a sharp critic of what I refer to as cap-and-tax, because it is an indirect tax that people will pay through their utility bills and at the pump and practically everyplace else. We have heard today from many of the witnesses that if there is a cap-and-tax proposal passed by the Congress, there will be a huge incentive for utilities that generate electricity from coal to convert to natural gas because they won't have to buy many carbon credits by using natural gas. That is going to increase the demand in natural gas and put pressure on increased prices.

With that in mind, I do not share my chairman's feeling that cap-and-tax is inevitable, but if it does pass, does that increase the urgency of lifting the moratorium on offshore drilling? And even if

it didn't, I would like to ask all of the witnesses simply to give me a yes or no answer of whether they support lifting the moratorium on offshore drilling right away.

Starting with you, Mr. McClendon.

Mr. MCCLENDON. We don't drill offshore. We don't drill in the Rocky Mountains, but I am for all things American, so I think we should develop all of our American assets. I will tell you that this new surge of shale production comes from private lands and I think it is something we all need to recognize, that there is a lot of gas coming out of some traditional——

Mr. SENSENBRENNER. The clock is ticking both across the way and here.

Mr. Smith.

Mr. SMITH. Policies that call for increased demand without corresponding plans to increase supply are a recipe for disaster. We absolutely believe that we should be developing all of our energy resources in the U.S., especially in the intermountain west and the outer continental shelf.

Mr. SENSENBRENNER. Okay, thank you.

Mr. Harris.

Mr. HARRIS. Sir, just a simple yes.

Mr. SENSENBRENNER. Okay.

Mr. Manning.

Mr. MANNING. [OFF MIKE]

Mr. SENSENBRENNER. Okay. Thank you.

Mr. Wells.

Mr. WELLS. The answer is yes.

Mr. SENSENBRENNER. Okay.

Mr. German.

Mr. GERMAN. It is a little different. We produce vehicles. We are not on the fuel-generation side, but Honda is certainly on record as saying that we need to reduce consumption and all ways to help do that should be on the table.

Mr. SENSENBRENNER. Okay.

The CHAIRMAN. Can the record just at this point note that the chairman could have had six people who took the opposite point of view, so it just showed the open mindedness of the chairman of this panel. [Laughter.]

Mr. SENSENBRENNER. Well, we will excuse the mistake the chairman may feel that he made on this, and I yield back the balance of my time.

The CHAIRMAN. I thank the gentleman.

We are going to take a—how much time is left? Does anyone know, on the roll call right now? What I am going to do is recognize the gentleman from Oregon, Mr. Blumenauer, and pass the gavel to him, and he can make a decision as to how long he wants his question period to go.

Mr. BLUMENAUER [presiding]. Thank you for your courtesy, Mr. Chairman.

I do appreciate the gist of the presentations here and particularly, Mr. McClendon, starting with what you were talking about in terms of increased supply. As you see, there is a modest difference of opinion around here in terms of point of emphasis. The evidence we have received from the administration is that the ma-

jority of the outer continental shelf is already available. There is only about 2 percent of the 7 percent of the gas that is off limits, and that basically nothing is going to happen for 20 to 30 years that is going to profoundly affect supply here.

So there are a couple of choices. We can spend all our time in energy battling over something that may happen 15 or 20 or 30 years from now, burn a lot of political energy. Or we can focus on what you have been talking about here—maximize supply. What I mentioned in my opening statement about providing incentives for people to actually conserve and reward people for stretching it more, and be able to talk about the amazing flexibility that the product that you are talking about here today offers for the next 10 or 15 years, while we are still increasing domestic supply, while we can deal with things that don't have people at each other's throats, and be able to actually make some progress.

I am curious, starting with you, sir, if you have some thought that maybe we might be able to have an energy policy for this century that talks about substitution. For example, why in the world would we have anybody heating hot water with electricity today from coal-fired plants, until we deal with it.

I am trying to get a sense of if you have some thoughts about how we might be able to get past the knife fight and the dueling statistics that won't make any difference for 20 years, and maybe get at what you are talking about here, to change the system, provide the incentives, and make that transition.

Mr. MCCLENDON. I believe my role in this hearing and in this world is to do one thing, and that is to increase the supply of affordable, clean-burning, American natural gas. I am not an expert on access. I am not an expert on offshore drilling. What I can offer is that our company is going to spend $10 billion this year to increase our number one position in the industry by 25 percent. Our production this year is going to increase by 25 percent. We produce 4 percent of our nation's natural gas.

I am here to testify that from existing sources, areas of production—Texas, Oklahoma, Louisiana, Arkansas—that there are enormous new resources of natural gas that in my view will increase the supply of natural gas in this country for at least the next decade by a minimum of 5 percent per year. What the market wants to do with that in terms of making cleaner cars, making cleaner electricity, I will leave that to the market, but I will tell you that it will take a while for people to adjust to this news——

Mr. BLUMENAUER. I am sorry. I want to move to Mr. Manning.

I appreciate what you are saying, but I think it is very important if we are going to be able to roll the—nothing that we are hearing indicates that some of the peripheral things are going to make any difference for 10 or 15 years, but you are looking for policy changes that will make a difference almost immediately. You have confidence that we can do this within the range of supply?

Mr. MANNING. I am sorry, I missed it again.

The tankless water heater which we now have to source from Europe gives you a 70 percent reduction in heat energy to heat water, and it only heats water when you need it. So there is a tremendous amount of low-hanging fruit out there. I think you are right. Decoupling and those sorts of policy initiatives, like the OCS debate,

that starts to bring in the states and the opportunity for the federal government to work with the states and to create some sort of a set of rules with a transparent, clear understanding of how to get this stuff done. The cheapest power plant is the one that you never build.

Mr. BLUMENAUER. I appreciate your courtesy. I apologize that I am running off to vote and leave you to your own devices. But I would like to follow up with each of you about the policy framework that we should be doing here in the next 10 years. One of the things we are advocating is with Senator Obama, with the House Democratic leadership and trying to make it part of a discussion, is an infrastructure plan for this century that is realistic about what we do with energy and making these pieces, particularly as it relates to natural gas, be able to coax as much out of that as possible.

I would be very interested in being able to explore with you the sorts of—your comfort level for being able to go ahead for the next dozen years or so, and the specific policies that we might be able to do to encourage transition, encourage appropriate conservation. I mean, I feel good that my hot water heater in Portland is not working when I am here in Washington, D.C., but there are other things I think large and small that we would really like the benefit of your counsel so that when we finish the partisan knife fighting and we do all this stuff, we are able to move forward with things that will make a difference this next decade.

I appreciate your courtesy and how informative your testimony was. It was very useful.

[RECESS]

The CHAIRMAN [presiding]. So ladies and gentlemen, we welcome you back to this Select Committee on Energy Independence and Global Warming, and our discussion of the role which new discoveries of natural gas can play in our energy and climate change legislative deliberations in our country.

I am looking around, and not seeing any member, I will recognize myself, which is the prerogative of the chair.

Mr. German, Honda has some of the best engineers in the world. I find it interesting that after building a compressed natural gas passenger vehicle, Honda's engineers have pursued a fuel cell passenger vehicle based initially on producing hydrogen from natural gas. Explain to the select committee Honda's reasoning here. Was this driven by a desire to find a more efficient way to use natural gas in the transportation sector?

Mr. GERMAN. No. The fuel cell——

The CHAIRMAN. Would you turn on the microphone, please?

Mr. GERMAN. It should be on.

Our fuel cell vehicle uses compressed hydrogen simply because right now that is the best option for powering a fuel cell vehicle. We looked at all the other ways of doing it, at least the current states of technology, and that was the best. If you are using compressed hydrogen, then there are a lot of things you can learn from compressed natural gas, both from the customer side, how they respond to refueling, especially refueling at home.

We see the home refueling stations as a way to help break the chicken-and-egg problem that you have with new technologies and

new fuels. It is very interesting in that this home refueling is very similar for both natural gas and for hydrogen, so there are just a lot of similarities there. So we have been continuing our natural gas program. One of the advantages of that is that we get experience that we think will translate into fuel cells.

The CHAIRMAN. Now, can you talk a little bit about this heat electricity product that you have that people can purchase in their homes? How many have you sold in the United States?

Mr. GERMAN. So far in the U.S. it is probably double digits, but this is something that we have been selling in Japan——

The CHAIRMAN. So more than nine.

Mr. GERMAN. More than nine, yes. [Laughter.]

But we have been selling this similar product in Japan since 2003 or 2004, and we have sold 70,000 of them.

The CHAIRMAN. Seventy-thousand of them in Japan?

Mr. GERMAN. In Japan.

The CHAIRMAN. And they are in residences?

Mr. GERMAN. Yes, primarily.

The CHAIRMAN. And is there a tax break for that in Japan?

Mr. GERMAN. I don't know. Sorry.

The CHAIRMAN. Would it be advisable for us to have a tax break here in the United States to encourage people to move in that direction?

Mr. GERMAN. In general, Honda thinks that temporary near-term incentives can be really helpful in getting a new technology started. So yes, that could be something that could help jumpstart it here in the U.S.

The CHAIRMAN. Okay. Is there a difference between the receptivity in the Japanese market and the U.S. market? Or is it just that you focused on Japan first and you are just breaking into double digits here because of a later start?

Mr. GERMAN. Yes. We have just started in the U.S. and we are starting in the Northeast. There is probably one major difference between Japan and the U.S., and that is the complexity of the regulatory structure. Where in Japan basically you work it out with one place and you have the whole country covered, and here you have every utility and every state has different rules.

The CHAIRMAN. So you can sell the electricity back into the grid in Japan?

Mr. GERMAN. Yes.

The CHAIRMAN. And you can't really do that in the United States.

Mr. GERMAN. No.

The CHAIRMAN. Is that a law we have to change here to move to net metering?

Mr. GERMAN. It doesn't necessarily require a law. Certainly, a law would help streamline things, but the utilities and the PUCs certainly have the ability to allow it and to set it up without that.

The CHAIRMAN. Right, but——

Mr. GERMAN. Yes, they are not.

The CHAIRMAN. Except for the fact that they are not.

Mr. GERMAN. Right.

The CHAIRMAN. If you leave aside the fact that they are not, do you think a law would help?

Mr. GERMAN. Yes, it would certainly help. There is a major market——

The CHAIRMAN. If there was a law that actually allowed for net metering across the whole country and you sold 70,000 units in Japan right now, how many units do you think you could sell in the United States?

Mr. GERMAN. I can't answer that. One of the problems you have is that——

The CHAIRMAN. You are not in—this is the development sector. [Laughter.]

Mr. McClendon would have answered that section. Okay?

Mr. GERMAN. Honda made the mistake of sending an engineer here. [Laughter.]

The CHAIRMAN. My time is—okay.

Mr. GERMAN. It is a unique product. Anytime you have a unique product, you have a consumer education process that you have to go through to get them comfortable with it.

The CHAIRMAN. Okay. I won't be throwing bigger watermelons across the plate for the rest of the day.

Let me turn and recognize the gentleman from Oklahoma, Mr. Sullivan.

Mr. SULLIVAN. Thank you, Mr. Chairman.

I have some questions for Mr. McClendon. Can you speak about the outlook for Barnett shale and Marcellus shale? Is there adequate pipeline capacity to market the Barnett shale production?

Mr. MCCLENDON. Sir, let me give you some context here. The Barnett produces about four bcf a day out of about 53 bcf produced in the U.S. right now, so about 7 percent or 8 percent of the nation's gas—the largest gas field in the country. The Marcellus you referred to is the formation that underlies Pennsylvania, New York and parts of West Virginia.

There is sufficient pipeline capacity now, but as production increases both in those two areas and also in the Woodford in Oklahoma and in the Haynesville in Louisiana, we are going to have to build more pipelines. But the industry has the financial ability to do that. We have the responsibility to do that, and we will.

Mr. SULLIVAN. What is the break-even point for gas shale?

Mr. MCCLENDON. Today, I believe the break-even point using Henry Hub pricing is somewhere around $8 per MMBTU for the natural gas industry. That includes some return on investment. That is why I think that the range of prices for natural gas will over the next call it 3 to 5 years average between $9 to $11 per MMBTU.

Mr. SULLIVAN. Are you currently considering exploring in areas of Pennsylvania that were under drilling moratorium that were lifted by Governor Rendell?

Mr. MCCLENDON. We have operations or leaseholds, rather, all across Pennsylvania. We are drilling there today. We were not affected by the previous moratorium, but we are now affected by one in New York, which has been passed by the governor in the past couple of weeks that has shut down Marcellus drilling in New York until further environmental impact work has been completed.

Mr. SULLIVAN. Thank you very much.

Mr. German, how many cars are you guys making right now—the ones that are dedicated NGVs a year?

Mr. GERMAN. Yes. Since we introduced it in 1997, we have sold about 7,500. Currently, the demand has spiked with the spike in gas prices. We can't currently keep up with it, so it is something we have to evaluate increasing the sales in the future. But it has been averaging less than 1,000 a year so far.

Mr. SULLIVAN. How much do they cost?

Mr. GERMAN. It is $25,000, which is about a $7,000 incremental over a comparable Civic.

Mr. SULLIVAN. Thank you very much.

Thank you, Mr. Chairman.

The CHAIRMAN. Do you rest your case? Natural gas speaks for itself.

The gentlelady from California, Ms. Solis, is recognized.

Ms. SOLIS. Thank you, Mr. Chairman.

I just wanted to mention that on Monday I had the privilege of attending a special hearing that was held between Republicans and Democrats in New Orleans. The subject matter was energy independence and security, and a lot of the issues were talked about here.

But I am still kind of concerned about comments that Mr. Smith made regarding our inability to open up more opportunities to drill, when the facts are that we do have about 68 million acres that are available in the national petroleum reserve that is available that we are not really taking advantage of. Those are already available. There are leases. There are permits.

I haven't heard of any major environmental problems that have come up to restrict any further opportunities there. In fact, several years ago one of the refinery companies in Arizona, in Yuma to be more exact, asked for permits and they were issued, and the company there decided not to go forward as a result of costs—not environmental costs, but costs that they thought wouldn't be profitable, so they didn't go ahead and build their refinery.

With respect to the outer continental shelf, we have passed legislation in the past 2 years to allow for drilling. In fact, that was something that was done by this Congress. I don't understand why there is this insistence that we continue to have this dependence on fossil fuel when we know that it is detrimental, it is limited. There should be other ways of looking at alternative fuels and technology.

My question at that debate, and would be for you, is what are the petroleum companies doing to invest in renewable technologies? I mean, obviously you are up against many financial factors as well, in terms of having adequate equipment and the workforce and what have you. But what are we looking at down the line so that we can really kind of cut our dependency on what happens in the Middle East and geopolitical matters that we are never going to be able to control?

So I would like to have a response.

Mr. SMITH. I think that is a very appropriate and good question. Natural gas, as you know, is really the silent partner to renewable energy. It is the thing that takes renewable energy from a vision to a reality. Today, wind power provides .77 percent of our elec-

tricity demand and it has the potential to grow quite a bit more. Solar is about .01 percent of our electrical demand today, or electrical production.

When utilities build new production or new capacity for natural gas or for wind and solar, they want to be able to ensure their customers that when the sun isn't shining and the wind isn't blowing that they can still produce electricity for homes and for businesses. So natural gas is that source of power that gets billed as the intermittent source that backs up those renewable supplies of energy.

So it is not an either-or. Natural gas is the partner to renewable energy as we move towards a more renewable future.

Ms. SOLIS. But you didn't answer my question, though. What kinds of investments can your industry make to help? Or is there any talk about that? I mean, that is what is disturbing to me. We are in a recession. We have high unemployment. We have people paying outrageous amounts for their energy, their electricity, and it is going to get worse. In places like mine in California, it is unstoppable. We are seeing a little relief—20 cents—but that doesn't make it. People need to step up to the plate and take responsibility.

I am glad to hear there are other sources of energy that we can look at, and I agree that liquefied natural gas is something that we should be looking at. But it needs to be done also in a very safe manner because the placement of facilities in communities, there was a project that was going to be placed in East Los Angeles and many in the community were very alarmed because they were not notified appropriately about what elements were being taken into consideration—safety, first responders, who is responsible if there is something, an accident; who is going to be liable for much of that?

So those are some of the questions I have also. I am not turning it off, but I am saying that I think there is an important factor there because there aren't a lot of regulations on the books also that talk about protecting where sitings are. And I don't even know if that is where we need to go on this, because we import a lot of our natural gas, but I think that it is something that we are going to have to talk about as well.

The CHAIRMAN. The gentlelady's time has expired.

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

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

I again thank the witnesses.

I support increased domestic production of natural gas on the outer continental shelf as well as on public lands. I think technology has brought us a long way to look at some unconventional ways of extracting this resource in an environmentally sound way. You know, it is all about how the mix of incentives that we set forth for the different energy sources that I think all should be on the table as we move forward to meet the nation's energy needs.

One of the areas I wanted to explore, Mr. German, was an area you didn't get a chance to talk about in your opening remarks, but it is in your written testimony, and that is biogas. So with non-fossil renewable methane gas, whether it is coming from cellulosic biomass, whether it is coming from sewage and other organic mate-

rial, if you could just explain for the committee, describe for us the current state of the technology for turning biogas into liquid fuel for use in conventional vehicles, and what more Congress can do to help advance renewable biogas.

Mr. GERMAN. The current source that is already being utilized to some extent is natural gas that is produced as landfills deteriorate. It is just a matter of capturing it. A lot more could be done with that, but that supply is inherently limited. We should try to take advantage of as much as we can, but it is never going to be a large percentage of the fuel that is produced.

The more interesting case is from cellulosic feedstocks, where a lot of work has been going into that. It is recognized that cellulose should have much lower greenhouse gas emissions and much lower energy needs than trying to produce ethanol from starches, for example.

But there is a lot of work that still needs to be done on the development of that process, and it is by no means certain that fermentation of cellulosic is going to work better than some other processes. If gasification proves to be a better solution in the long run, now you could have a very large supply of renewable biogas.

So now the question comes, what do you do with this biogas? You can either take it through another step and liquefy it, or you can use it directly, perhaps in natural gas vehicles. So looking down the road, if gasification of cellulosic feedstocks becomes feasible, then that could be a major boost to compressed natural gas vehicles.

Ms. HERSETH SANDLIN. We certainly do hope it becomes feasible, and Mr. Manning, I want to hear from you as well. As you may know, in the farm bill, a different committee on which I sit, the Agriculture Committee, we took important steps to facilitate research and development of cellulosic biofuels, and we do hope that working with USDA and the Department of Energy that we will see the types of advancements made to make it commercially available to consumers across the country. I think there are some additional steps that Congress can take in that regard.

Mr. Manning, did you have a comment?

Mr. MANNING. Very quickly. Our company was the first to capture methane off a landfill in Staten Island, probably 30 years ago. You are exactly where you need to be, and of course there is the opportunity with agricultural waste, animal waste, but there is also the opportunity to use the whole chicken, for lack of a better word. I recently met last week with Tysons and partaking of what they are doing.

So I think it is still very early days. I think it is also very interesting, coming from an urban environment like we do, the tipping fees, the refuse fees from our cities in this country, are enormous. So there should be a tremendous opportunity for Congress, I would think, to look at that as a very real option.

As you know, the components, the methane components are quite practical. So there is a whole array of options. Part of the issue that we face, if I could just finish, is transmission—in other words, getting it from the farm to the load; getting it from the solar desert to the load; getting natural gas moved around. Transmission is a critical issue for Congress. We have been trying to build a pipeline

that will re-power a number of power plants in the New York area for 6 years without success. All federal approval is in place, and we were defeated. And that would just immediately back-out use of oil for natural gas. So that is a very important issue as well.

Ms. HERSETH SANDLIN. I appreciate your comments. My time is almost expired, but you know, where I am from, we don't say use the whole chicken. We say we use the whole plant. You know, corn ethanol gets a bad rap, but there is a lot of agricultural waste when you are talking about corn harvests, whether it is corn stover, whether it is the corn cob. There is a whole host of opportunities here for us technologically.

And I couldn't agree with you more on transmission, whether it is the siting of pipelines and the construction of those pipelines, or the siting of energy corridors to get the vast amounts of wind and solar that we have in certain parts of the country transmitted to more populated areas.

So I thank you all for your testimony, and I yield back.

The CHAIRMAN. Great.

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

Mr. CLEAVER. Thank you, Mr. Chairman.

Mr. McClendon, based on your testimony, I think you would agree that while natural gas is much cleaner, it is finite, and I think you mentioned we may have supplies for 100 years.

Mr. MCCLENDON. It is 118 today, and that is at least in way of thinking——

Mr. CLEAVER. We will all be gone when it runs out, most of us.

Mr. MCCLENDON. It is 118 years on what we know today, with the technology that we have today, on the resources that we have found. So it is a pretty ingenious human species that we are, and I would think 50 years from now we will find more gas and we will find more ways to get a higher percentage, a higher recovery factor out of these shales that we are drilling into right now.

Mr. CLEAVER. The point I want to make along those lines is while I agree with your testimony, and I also think that we are probably not moving fast enough toward using natural gas in any number of ways, but my concern is that it is invasive when we extract it. How do you compare the process of getting natural gas with fossil fuel—well, both are fossil fuels—but oil in terms of their impact on the environment?

Mr. MCCLENDON. Well, when you talk about invasive, I think about a weed that takes over the country. I think the good news today is that the natural gas that we are finding in the shales is being found, frankly, underneath gas fields that have already been in production for decades—Oklahoma, Louisiana, Arkansas, Texas. And so these are places where people are comfortable with additional drilling. Pennsylvania is the cradle of the American oil industry, 1859.

So I wouldn't agree that we are an invasive species. We are certainly drilling in more areas today, but I think the good news is 33 of the 50 American states do produce. I would say that if you are looking at the total environmental impact—natural gas versus oil versus coal—that natural gas ends up being very low on the environmental impact scale. So it is produced today in areas where people want it to be produced, and it is the key to rolling back oil

prices, gasoline prices to where they were 5 years ago. I know of no other way to do that, but natural gas can do that.

Mr. CLEAVER. I represent Kansas City, Missouri, but I was born and raised in Texas, and went to college, my first year, in Oklahoma. There were gas and oil fields less than a mile from the house, from the public housing project where I grew up. But the environmental issue is something that I am concerned about.

Many Texans probably are as confused as me. You drive down the highway and you will see flames coming out of the ground, just flames with no apparent danger. My assumption is that that is natural gas.

Mr. MCCLENDON. My assumption would be it would be illegal. Our company operates 38,000 wells, the largest number in the country, and we are not allowed to flare gas anywhere in the United States. So I really need you to think about, on the environmental balance sheet, natural gas is the fuel that can back out dirtier oil, back out dirtier coal, and on a net-net basis we are much ahead by using natural gas.

Mr. CLEAVER. So you have never seen the flames?

Mr. MCCLENDON. I have seen them in pictures and I know that in the Middle East today and in Nigeria today they flare a lot of natural gas, but in the states where we operate, we are not allowed to flare natural gas, and we are the biggest producer of gas in Texas, so that is news to me that you can flare gas in Texas. Again, maybe a long time ago I think you probably could, but——

Mr. CLEAVER. Well, are you suggesting that I am old?

Mr. MCCLENDON. Pardon me? [Laughter.]

You know, you are not any older than I am I don't think, and things have changed a lot in our lifetimes, for sure.

Mr. CLEAVER. Yes, I haven't seen it in the last few years because I don't live there, and maybe it is a practice that has been discontinued.

Mr. MCCLENDON. It really has. I mean, for a lot of reasons, not the least of which is for environmental reasons, but also why would you flare something that is as valuable as natural gas today? You capture it and sell it.

Mr. CLEAVER. Well, yes, that was the point I was going to make. That was the question I was going to ask, about environmental damage and also wasting.

All right. I yield back the balance of my time.

The CHAIRMAN. Great. The gentleman yields back.

The chair recognizes the gentleman from Washington state, Mr. Inslee.

Mr. INSLEE. Thank you.

There is I think a discrepancy in a couple of the testimonies that I want to see if we can clear up. I think Mr. German in his testimony provided a graph showing CO_2 emissions reductions associated with natural gas. It was well-to-wheel emission reductions and it showed CO_2 reductions, as I read it, about 42 percent or something in there. Is that about right, Mr. German? Am I reading that?

Mr. GERMAN. That is for the Civic GX compared to an average vehicle.

Mr. INSLEE. Okay. And I was reading this, I think Mr. Manning's testimony that quoted a figure of 90 to 95 percent reduction, as I understand it.

Mr. MANNING. [OFF MIKE]

Mr. INSLEE. I am sorry?

Mr. MANNING. Yes, I am sorry. I apologize. That number relates to if you take old technology and convert to natural gas. In other words, the least efficient, we are making reference there to displacing ancient technology.

Mr. INSLEE. I see. Okay.

Mr. MANNING. Mr. German is comparing new to new, which is probably the better number.

Mr. INSLEE. Got it.

Mr. MANNING. We are talking about getting old vehicles off the road with brand new technology running on natural gas.

Mr. INSLEE. So if we replaced—comparing new gasoline-run internal combustion sleet, a new internal combustion gasoline-powered fleet, with a new internal combustion natural gas-powered fleet, the best evidence is we would reduce CO_2 emissions about 40 to 42 percent. At least that is Honda's experience, then, is that right?

Mr. GERMAN. If you convert a larger car to natural gas, the savings won't be as large. If you converted the entire fleet, the CO_2 reductions would probably be 25 to 30 percent.

Mr. INSLEE. I will take your word for it. I know there is a good rationale, and I won't get into it. So if we were, as opposed to replacing our fleet with gasoline-powered internal combustion engines, if we replaced the whole fleet with natural gas internal combustion engines with the same model-type and size, the CO_2 reductions would be about what number?

Mr. GERMAN. About 25 to 30 percent.

Mr. INSLEE. About 25 to 30 percent. Okay. Thank you.

Mr. GERMAN. Of course, this would be on top of any technology improvements you make to the baseline vehicle.

Mr. INSLEE. Right. Right, which can be very significant, by the way. We are very excited about that. I just drove a plug-in hybrid that Toyota has made just as kind of a prototype yesterday, and of course Honda's got a lot of fuel cell progress, and GM has I think made a commercial decision to do a plug-in hybrid vehicle, the Volt. I believe this is really in the near-term future, the electrification of the car. So I am very excited about that, but we have to have the electricity obviously to run the cars. So I want to ask you about that.

We are having this debate, this discussion of offshore drilling in part for natural gas. I want to try to ask you all about the parameters of the possible of natural gas exploration domestically, compared to the potential parameters for other fuel sources. For instance, I am advised that the National Renewable Energy Lab found that if you look at the land domestically that could be available just for solar technology—let's just take solar-thermal technology, to use thermal energy with mirrors that bounce the heat onto a pipe, you heat up salt, and you drive a steam turbine engine.

They found that if you exclude mountain ranges, if you exclude cities, if you exclude environmentally protected areas, if you exclude areas that the grade would not allow—if you just look at the areas that are really suited for solar energy in the American Southwest, we could produce seven times more than the entire energy usage of the United States, just using solar-thermal power.

Now, today that would be considerably more expensive than natural gas with today's situation, before we enjoy scales of economy. But nonetheless, it is significant. I just met with a company that has plans to produce in America—it is the MON Company. It is now a German company, but they tell me that in a 90-mile area of the Southwest, you could produce all of the electricity the United States used and run, according to the Pacific Northwest Lab, and run the entire transportation system of the United States once cars are electrified, which I think is relatively soon.

So I guess looking at those enormous potential growth, how does natural gas stack up as far as potential growth in domestic production? Is it the same? Is it more? Is it less? Just give me some ideas in that regard.

Mr. Manning.

Mr. MANNING. If I could just take the first shot at that. The critical role of natural gas—and this has been discussed a little bit—is that technology when the sun goes down and the load is still maintained for a couple of hours, the best way obviously as you say you have salt storage. There are other ways to do that, but a lot of the benefit of natural gas is to accommodate intermittent power, be it wind or solar. The opportunity to balance the grid, which is a critical need, is best with natural gas generation because it can come up very quickly.

Large baseload plants can't respond quickly. Natural gas plants can. So you could use a combination of peaking plants. This leaves aside the whole conversation about high-efficiency technologies and distributing your generation. There are lots of things that you can do, but what my friend referred to here was the silent partner of renewable power is natural gas because it can facilitate.

What you are talking about is large desert solar, massive installation, the cover story in Scientific American last year—absolutely, that opportunity is there, but natural gas I do believe still plays a major role. But we have also been speaking about the opportunity to use natural gas for things like the freewatt unit by Honda, where you can actually—natural gas is very efficient in its final use. It can be very efficient at the burner tip.

So then, of course, one of the biggest issues and the challenges that you referred to in terms of major central plant solar is transmission. How do you get that power from those large opportunities into the load? And so transmission is very difficult to do, and if you only want to build transmission that is just intermittent power, that is just solar or wind, which of course, you know, I recognize that is important in your bill.

The challenge that we have, of course, then is how you balance that load. And that is an area of real challenge for our industry.

Mr. INSLEE. There is an answer to that, which is pass my bill on establishing a high-capacity corridor. Thank you.

Thank you, Mr. Chairman.

The CHAIRMAN. The gentleman's time has expired.

What we will do is we will go to a round of 2-minute questioning from the members.

Mr. McClendon, I would like to talk to you about water, the role that water plays in the hydraulic fracturing. New York state has just passed a law which requires there to be a consideration of the environmental impact that this new natural gas drilling will have on the water supply. Can you talk about it?

Mr. MCCLENDON. I can. Water cannot be separated from the discovery of natural gas any more than water can be separated from any industrial process. It is part and parcel of agriculture. It is part and parcel of industry, and we have to have a lot of water to drill our wells.

Now, how do we go about getting that water? We operate in some of the most arid parts of the United States—west Texas, western Oklahoma—places with less than 10 inches of rain. We do a good job of building collection dams for water in those areas. We use municipal water. In New York state and Pennsylvania, there is a fair amount of stream water that we think we can access.

We have to work with the Susquehanna Water District, the Delaware Water District, and other water districts, but we are just like any other industry that comes to an area and wants to set up shop to create jobs. We are going to have to have water and we will be responsible users of that water.

The CHAIRMAN. Okay, great. I think it is going to be a big issue for us to have to deal with. This water issue is not unlike the corn, ethanol, food issue. You know? You wind up with a tension, and I think we are going to have a tension here on water and we are going to have to get down to the bottom of it and create a policy.

One final question, yes and no. You were good to do the outer continental shelf drilling issue, and each of you expressed a lack of expertise in it. That is subject material. So I am going to give you another issue. Pending before the Senate right now is the extension of the renewable tax credit. We have passed it through the House four times. Should the Senate pass the renewable tax credit before we adjourn this year, and put it on the president's desk?

Mr. McClendon.

Mr. MCCLENDON. I don't know really anything about it.

The CHAIRMAN. You said earlier you wanted all assets on it—so this is how to get the asset out there.

Mr. MCCLENDON. I am just there to provide the firm foundation underneath renewables, and if the market wants renewables——

The CHAIRMAN. Okay.

How about you, Mr. Smith?

Mr. SMITH. Who pays for it?

The CHAIRMAN. The American taxpayer, the same people who give the tax breaks to your industry. [Laughter.]

Who else?

Mr. SMITH. I would ask, with the prices we have today for energy, why aren't those sources of energy competitive on their own?

The CHAIRMAN. That is what we are saying about the natural gas tax breaks, the oil tax breaks, so thank you for raising that issue.

Mr. Harris.

Mr. HARRIS. Yes, an unqualified yes.

The CHAIRMAN. Okay, thank you.

Mr. Manning.

Mr. MANNING. Unqualified yes, and it should be a top priority.

The CHAIRMAN. Thank you.

Mr. Wells.

Mr. WELLS. Yes.

The CHAIRMAN. Thank you.

Mr. GERMAN. Yes.

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

That completes my time. I will recognize the gentleman from Oregon, Mr. Blumenauer.

Mr. BLUMENAUER. Thank you.

I am curious if any of you have some thoughts or observations about, as we are dealing with the primary role that coal is playing now and is going to probably continue to play for the foreseeable future, even with natural gas as a transition, if there is some potential in your judgment for some of the technologies to create gas in the coal seams, some of the processing that is underway sort of dealing with a combination of carbon sequestration and conversion in a way that appears to have some promise.

Mr. Wells.

Mr. WELLS. Yes, excellent question. As part of our effort to diversify our sources of energy today for pure energy, we are 99 percent dependent on natural gas, and are looking into the gasification of coal into natural gas. We have several projects that we are working with partners around the United States looking at deploying that.

Mr. BLUMENAUER. Great.

Mr. WELLS. As part of that gasification process, you do produce a purer stream of CO_2, which makes the potential for carbon sequestration much easier.

Mr. BLUMENAUER. Mr. McClendon.

Mr. MCCLENDON. My opinion is it is completely unnecessary. You have an inferior molecular product in the form of coal. You are trying to turn it into a superior molecular product in the form of natural gas. Nobody is trying to coalify gas and there is a reason for that. Gas is a superior environmental product to coal. People want to gasify coal for a reason. Once you are done, you still have a lump of carbon over there that you have to get rid of.

So I would ask Congress to spend more time thinking about how to enhance the production of the superior molecular product, natural gas, as opposed to spending billions of dollars on coal gasification.

Mr. BLUMENAUER. There are people who are using the technology, as I understand it, developed by Hitler and Stalin, that looks promising in terms of actually being able to sequester that carbon. But you think not?

Mr. MCCLENDON. I sure haven't seen it, and I notice that Congress killed most of the funding for that research earlier this year.

Mr. BLUMENAUER. It was the president that pulled the plug on it. It was not the Congress.

Mr. MCCLENDON. Okay.

Mr. BLUMENAUER. We put money behind it because we were trying to have a balance, and the administration killed it.

The CHAIRMAN. The gentleman's time has expired.

Mr. BLUMENAUER. Can I just see if anybody else had some thoughts on gasification?

Mr. SMITH. Yes, just a quick comment on that. Basically in countries where the coal gasification is utilized is in countries where there is no domestic source of natural gas, basically.

Mr. BLUMENAUER. Thank you.

The CHAIRMAN. The chair recognizes the gentleman from Missouri, Mr. Cleaver.

Mr. CLEAVER. Thank you, Mr. Chairman.

I mentioned the D.C. buses with the signs on natural gas. What—any of you—how much do you think we can do to create a higher level of natural gas usage in vehicles? What amount of natural gas that is available could we inject into the market right now to power vehicles?

Mr. MANNING. If I could just start, I can't quantify that immediately, but what I can tell you is that Long Island Bus has 400 buses 100 percent committed. They did it when it was non-economic to do so. They did it in large measure with incentives from the company and from the state and from the federal government a number of years ago. Now, it probably makes good economic sense, now they are ahead of the game.

As I indicated, there is a lot of interest right now. We are probably over one-third of the buses in the Massachusetts area are now converted to natural gas. It is a money issue. There is competing technology in diesel hybrids. One of the numbers that we did have in our testimony is that you have a 99 percent reduction in particulate when you have a natural gas vehicle bus.

The beauty of buses, of course, is they are centrally fueled, so that we are big fans of natural gas vehicles, but our success has been where they are centrally fueled, such as buses. But what we had to do, we built 17 gas depots in New York City. We built 15 in Boston, and we built the Jackie Gleason bus garage for $3 million 2 decades ago to force the MTA's hand to get them to do this. They had a bit of a love affair with diesel hybrid. Now, they are coming back to natural gas. It may be a price issue, but it is a money issue, but it is there.

The CHAIRMAN. The gentleman's time has expired.

Mr. McClendon has to leave. We usually ask the witnesses to give us a 1-minute summation. So before I recognize Mr. Inslee, could you give us your 1-minute before you run out the door?

Mr. MCCLENDON. Certainly. My 1 minute would be, as you all go home for recess, I hope that you take back the message to your constituents that you have a plan that can lower their gasoline costs in half; that you can allow them to drive environmentally more friendly cars; and that you can allow them to use a product that creates American jobs as it is consumed; and use a product that enhances national security.

Natural gas does all that, and this industry can increase natural gas production by at least 5 percent per year for at least the next decade. Please think about your policies with regard to natural gas, with a mind-frame of abundance, rather than scarcity.

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

Mr. MCCLENDON. Thank you for the opportunity to be here.

The CHAIRMAN. Thank you, sir. Thank you for being here.

The chair recognizes the gentleman from Washington state, Mr. Inslee.

Mr. INSLEE. Yes, a question for the whole panel. Are any of you opposed to the adoption of a cap-and-trade system to limit the amount of global warming gases emitted and have a permit system for those who are emitting them? Are any of you opposed to the adoption of such a system?

No one is opposed?

Mr. SMITH. I think the devil is in the details. I think everyone would want to see the details of that plan before they blindly said yes.

Mr. INSLEE. Well, do you think, Mr. Smith, do you think we ought to have a national limitation on our emissions of global warming? And do you think we ought to have a permit system that polluters pay for to pollute?

Mr. SMITH. I think one in five Americans today currently qualify for energy assistance, and they are struggling to pay their heating and electricity bills. They are struggling to get to work. They are struggling to pay for their food. I think you need to ask the American public if that is their highest priority is to make energy more expensive or if there are more creative market-based approaches to help lower the price of energy, while also reducing carbon emissions and other greenhouse gases.

Mr. INSLEE. So do you think polluters should pay to pollute in this country? And let me tell you, I ask you, when you go to the garbage dump and you unload your pickup load of stuff, I bet they charge you $10 to $20 to do that where you live. You are shaking your head yes.

So do you think that industries that use our one atmosphere as a refuge dumping spot should have to pay for the right to use that as a garbage dump?

Mr. SMITH. I am not sure if I understand. I think generally what you are saying, or what you are asking me is should there be a cost to pollute, and I would agree with that. That is probably fair.

Mr. INSLEE. I appreciate that. I will remind you of that next year when we are working on this cap-and-trade system. [Laughter.]

Thanks.

The CHAIRMAN. That completes the time for questions, so we will go to the summation of each of our witnesses, 1 minute apiece, what the big thought is that you want us to remember as we move forward legislatively.

Mr. Smith.

Mr. SMITH. Thank you.

Well, it is clear from the testimony today that energy drives our economy, and we have heard compelling reasons why we need more natural gas for transportation, for food, for feedstocks, and for electricity. Natural gas, especially off of federal lands, is a critical supply today and it looks like it will be for quite some time. It is proven. It is a near-term solution, and we can't kick the can down the road anymore on the deciding whether or not these areas should be open for development. It will just be delaying those problems for future generations, and I hope this Congress will look at opening

the OCS and providing better, more timely access for development in the intermountain west.

The CHAIRMAN. Okay.

Mr. Harris.

Mr. HARRIS. Yes, I think I would like to close by saying global warming and energy security are issues we should address, and I believe the way to address those issues are access to resources and the ability to build the infrastructure necessary to bring those resources to the marketplace, and also import LNG and other products that will diversify our energy supply.

The CHAIRMAN. Mr. Manning.

Mr. MANNING. We have made an 80 percent commitment to reduce climate change emissions by 2050. We are 37 percent of the way there. I was a delegate to Kyoto in 1997 for 13 days. We have been working on this file now since about 1994, by my recollection, in terms of strategies. We think that this could be a critical component, the work that you are doing today.

We think that gas is a critical facilitator of the technologies that we will need to do that. We would encourage you to give us a set of rules so that we can invest in a set of rules, probably involving cap-and-trade, and that kind of certainty will drive that kind of investment which we believe will allow us to use less fuel.

Natural gas is a precious commodity. It facilitates a great deal of technological change. We should use it wisely.

The CHAIRMAN. Okay. Thank you.

Mr. Wells.

Mr. WELLS. Thank you.

I sit here representing a solutions provider to a lot of the issues that we talked about today. My company alone develops products like styrofoam insulation, which that product alone saves over 200 million metric tons of CO_2 each year. You mention in your opening the lightweight plastics that get to be used in automobiles, that allow them to be more efficient. We talked about landfill gas. We have been a pioneer in the use of landfill gas. Just last week, we signed an agreement with EnRel to use plant waste towards ethanol and towards auto fuels.

But we sit on the natural gas margin. As natural gas prices will rise as demand increases, we will be the industry that leaves. We want to invest in the U.S. We want to provide these solutions to the U.S. by being in the U.S. We ask for policy that allows us to do so. Thank you.

The CHAIRMAN. Thank you, Mr. Wells.

Mr. German.

Mr. GERMAN. Yes, hi. Certainly, needs are great and we need to pursue multiple avenues to meet our transportation needs. Natural gas has a lot of potential to be a significant part of the near-term solution, but there are a lot of other potential solutions and a long-term need to avoid mandates. Set performance standards. Let the best technologies win in the long term.

Of course, this assumes equal playing fields for different technologies, and along those lines we would like to work with the committee on how to address selling electricity from our freewatt system back to the grid.

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

We thank each of you. Obviously, if the predictions come to pass, this is an incredible development. Some of our witnesses are maintaining that there could be a doubling of natural gas production in the United States over the next 10 years. If that is true, it is incredible news.

Right now, we produce about eight million barrels of oil per day in the United States; about 11 million barrels of oil equivalent in natural gas; and about 10 million barrels of oil equivalent in coal. If natural gas could be used to substitute for coal in the eventuality that a carbon capture and sequestration plan is not in place over the next 10 years; if natural gas could be used to displace oil in the vehicles which we drive—obviously in both global warming and in energy independence, there is something quite big as an ingredient, which is being added to the formula.

We thank you for being witnesses at our first hearing on this subject. I think it is going to rise in prominence as each month passes as we try to put in place the policies to solve these problems.

With that, this hearing is adjourned with the thanks of the committee.

[Whereupon, at 3:51 p.m., the committee was adjourned.]