

Abundance or Scarcity? Re-examining U.S. Oil and Gas Policy

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On December 3rd, 2014, *OurEnergyPolicy.org* hosted “Abundance or Scarcity? Re-examining U.S. Oil and Gas Policy,” a panel discussion at the Capitol Visitor Center in Washington, DC. The panel of thought-leaders discussed how recent growth in domestic oil and gas production is transforming the U.S. energy sector and challenging the paradigm of energy scarcity that has underpinned federal policy for the last 40 years. Specific topics included policy issues related to exports, infrastructure, natural gas as a transportation fuel and the climate.

Introduction: Bill Squadron, President, *OurEnergyPolicy.org*

Opening remarks:

- **Congressman Gene Green** (D-TX)
- **Congressman Pete Olson** (R-TX)

Speakers:

- **Karen Harbert**, President and CEO, Institute for 21st Century Energy, U.S. Chamber of Commerce
- **Elgie Holstein**, Senior Director for Strategic Planning, Environmental Defense Fund
- **Steven Rattner**, Chairman, Willett Advisors LLC; Former Head of the President’s Auto Task Force
- **Joe Cannon**, President and CEO, Fuel Freedom Foundation
- **Amy Harder** (Moderator), Energy Reporter, Wall Street Journal

Original Transcript

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BILL SQUADRON: So, welcome everyone for joining us this morning. I'm Bill Squadron, I'm President of Our Energy Policy Foundation and OurEnergyPolicy.org and we couldn't be more excited about having the discussion that will be going on today, with a tremendous group of panelists on a topic that I think is front and center for everyone who is involved in the energy sector. We will get to it in just a second. Let me give you a quick description of the agenda and timeline.

OurEnergyPolicy.org has worked very closely with the House Energy and Commerce Committee staff, members, and we are very grateful for their support and participation. We are fortunate enough that kicking off the discussion today will be some remarks from Congressman Gene Green and Pete Olson, so they will follow me in just a moment. Give some brief opening remarks and overview, we will then turn it over to Amy Harder and the panel, there will be a discussion after which we will have about 15 minutes of Q & A from the audience, so please, if you do have questions as you are listening to the discussion, make a note of them and there will be an opportunity to ask the panelists questions. And following that, a little bit after 1:00, we will break and there will be lunch served in the Atrium outside. Most importantly, which is really tied to the nature of OurEnergyPolicy.org, is that the discussion that you will hear today will then continue on online. So for those of you that are not familiar with OurEnergyPolicy.org, it is an organization that is devoted to using the internet to promote a more open, inclusive, efficient and creative government and to be a resource to policymakers in the Executive Branch, on the Hill, in state capitals and municipalities around the country, and does this by fostering dialogues on a weekly or biweekly basis online, which have the participation of more than a thousand and growing rapidly, expert participants from around the country and people from every sector because critical to our mission is that we are absolutely open, inclusive and nonpartisan. So you have participants in the discussion from corporate, from advocacy organizations, from institutional groups, from non-profits, from academia, from law, from finance, from every corner of the energy sector and from every corner of the country and what that does is provide to Washington a more diverse set of viewpoints, the ability to see true discussion on some of the topics that are of greatest concern to us and does it all in the sunshine. So while the discussion itself online is limited to people who are active participants in the energy sector, so that it's kept substantive, the fact is that it's open to everyone to look at, to read and all of these issues are debated in the sunshine. It's become a tool and a resource increasingly used by policy makers around the country and in fact, maybe members of Congress are now using the platform to elicit input from experts throughout the country. What you are seeing up here now from our website, is a dialogue that was begun recently by Senator Murkowski, where she wanted to reach out and get input from different views from experts throughout the country, from different parts of the energy landscape and also contribute really to a more democratic and open process. We actually think that this construct is something that applies not just to energy, but really is something that can address many of the stalemate and other kind of functional issues that we have seen here in Washington over the years and can help to make the process more creative, more open, more efficient.

So we will now turn it over to Congressman Green, I think will go first and then Congressman Olson and then we will have the panel. So, Congressman?

CONGRESSMAN GREEN: Good morning. Those of you who are not from Texas will probably have some trouble with Pete and I's accent today.

My name is Gene Green, I represent a very urban district in Houston that is east and north Houston, that is home to probably the -- we say it's the largest Petrochemical complex in the country, but now we have a Congressional District in Louisiana that goes from Baton Rouge down to New Orleans and includes more chemical plants and refineries than ours has. I appreciate speaking with you today. I am a member of the Energy and Commerce Committee, have been on the committee since 1997 and if you asked me ten years ago, you would have heard a completely different story than I'm talking today. A decade ago we were facing crisis. In fact, in our committee hearing and even seven years ago, we had hearings on Peak Oil, but we have discovered that we were asking the question then, how are we going to find the natural resources that we need, but today we face a different future. Unique opportunities, a number one of producer of oil and natural gas, the abundance of natural gas and oil in Texas alone revolutionized our industry and our economy. However, it's vital we move these commodities from the field to the market in the most economically and environmental and efficient way possible and that requires the infrastructure. The Keystone Pipeline has been a tragedy, but the issues are bigger than Keystone. We need cross border pipelines between Texas and Mexico, between the United States and Canada and we need a regulatory certainty that that can be done, because the current regiment is it's based on the President's Executive Orders for the last four or five presidents. To ensure we have that certainty that the House has passed and our committee did -- can have natural gas and oil for decades in the future, we passed HR3301, the North American Energy Infrastructure Act, which would permit the import and export of commodities across our national boundaries with Canada and Mexico. It would expedite the permitting for oil and natural gas pipelines as well as for electricity transmission across these national borders. Canada and Mexico, we have a free trade agreement with them. My frustration is that I can have 100 tank car train coming from Canada with heavy crude from Alberta, but I can't build a pipeline. And why would you not have a pipeline? That is the safest way to move that. Now, I want the railroads to be popular and profitable and they will be, but we need to make sure we have a regiment that we know with regulatory certainty that those pipelines will be considered. And that is the first step we need to do to really create a North American energy market between Mexico, the United States and Canada and that is what's important.

The U.S. is exporting natural gas now, but may need to import it in the future. In 2005, in a major energy bill we passed, we federalized permitting of natural gas export or imports. We thought we were going to be importing natural gas, but now those facilities are being turned around to export natural gas. Although, at least in Texas, we have a chemical industry that I represent, natural gas is probably, the cheap prices has been just a boom for what they are doing in our community. But you know, the Eagle Ford in Texas may not always be there, but I can tell you that south of the Rio Grande, they also have the Eagle Ford Shell, so we need to make sure today, we want to send natural gas to Mexico, Northern Mexico particularly, but years from now we may need that natural gas coming back that they are producing, for our chemical industry and our electricity generation. We expect the LNG facilities to come online. Cheniere in the Sabine River on the Louisiana side. We have a

facility in Freeport, Texas, Corpus Christi. We have a number of them, most of them will be on Louisiana and Texas ports because that is where the product is, although there is one here in Chesapeake that is moving along. There are two that have been permitted, I think in Oregon. I hope they can find natural gas to get there, but we know we will get the natural gas in Texas. In fact, my joke is, if somebody has a five foot ditch that goes into the Gulf of Mexico, they have contacted Peter and I about wanting an export permit for LNG, but we are not going to have all that many, but we will have enough to make sure we can export the product.

In Congress, we have worked in a bipartisan way to expedite permitting process to make sure we protect our environment but also capitalize on this once in a lifetime opportunity. HR6 passed our House committee and has been in the Senate, its domestic prosperity, global freedom act, passed by the House with both support for Democrats and Republicans. HR6 reflects changes offered by the Department of Energy, but required a deadline for approval. Those export permits typically its Federal Energy Regulatory Commission, they do most of the work. The Department of Energy does -- whether its in our natural interest to make the decision. I don't mind that, I just want to give them some timelines because we have some permits that have been sitting there for two years in the Department of Energy. Now, the Department of Energy has helped us with their regulatory system, but I still think it's probably not going to pass between now and the end of the year. But I still think Congress needs to set by statute in what we expect out of the Department of Energy. That Bill, we passed the House and actually with 47 Democratic votes. Business is supported with certainty on this legislation and there is a lot of other things we could talk about, but I want to make sure that my colleague and neighbor Pete Olson, he and I both serve on Energy and Commerce giving the opportunity, but I appreciate the invitation today. Thank you.

[applause]

CONGRESSMAN OLSON: Well, good morning. As Gene and I say back home, howdy y'all! For the record, Gene and I are not related. Yes, we fly the same flight to DC every week, the one that leaves at 10:24 in the morning, arrives about 2:30 in the afternoon. Yes, Monday and yesterday we were together almost all day with legislatures from Mexico and Canada in our Parliamentary discussions. Yes, we were both on a national TV show, *The Little Couple*, on Lifetime yesterday. And yes, we both know that J.J.Watt should be the NFL MVP this year from the Houston Texans. But, Gene is a Houston Cougar and I am a Rice Al, there is no way we can be related.

But seriously, it's great to be with my good friend and talk about American energy. What an amazing time this is in American energy space. The Energy Information Agency thinks they have breaking news, that America is becoming the leader in oil and gas production. Sorry guys, yes sir, *Wall Street Journal* and CNN months ago had said this was happening. Iraq has lost huge areas of production through the uprising of the insurgency there. Libya was forced to evacuate their capital when taken over by insurgents. Nigeria, a major supplier of oil for our east coast, is struggling to get over a crisis with the Ebola virus. And according to reports, Russia is trying to stop hydraulic fracturing in Europe. Ten years ago, that would send oil prices skyrocketing. But now, prices are falling dramatically. What is different?

Domestic American oil and gas production. Our refined products are filling gas tanks all over the world. The light and crude that we have sent overseas years ago is now staying here. I'm sorry, let me correct that. It's going over there. We would have imported that years ago. It is staying overseas in the global market. They are keeping their own oil. Right now, we have a powerhouse of energy production. And for Texas, this boom, as we say in Texas, is a "dang good thang." And it's great for my own town of Houston, Texas, as Gene mentioned, the energy capital of the world. But these benefits don't stop in Texas. They don't stop in America, don't stop at our borders. American energy helps our economy and the economy of our friends all over the world. In many parts of our world, as you all know, energy is being used as a weapon. American petroleum exports are the best weapon defense against that weapon. With natural gas, America should be like Texas Blue Bell ice cream, the best ice cream in the whole world and in Texas, we eat all the ice cream we can, the Blue Bell we can, and sell the rest. And that is what should be happening with American energy.

Of course that brings us to a very important debate, the debate on exporting crude oil from America. I join this debate with one rule I call, the energy Hippocratic oath. First do no harm. The decision around exports can't be taken lightly. I don't expect sweeping changes overnight, but we should and will have a healthy debate in our committee and in Congress going forward.

Studies are coming out about the impacts on prices for the families if we export oil. The next major step is here on Capitol Hill. Experts tell us what is going to happen if we go forward with the new policy. But this is not new. We went through the same process with exporting natural gas less than a decade ago. Reports came out from all sorts of groups, government, public sector, private sector, both sides of the issue, for it, against it, and it started an important debate. We came through now exporting American natural gas. We will generate a consensus sometime, I hope, in the next year, about exporting American crude. But during this debate, there are things we can still do. As Gene mentioned, I supported Bills and will continue to do so to make our power lines and pipelines more efficient. Make the construction much, much easier. All of this American energy means nothing if we can't get it to market, to refineries and where it goes to do the good it's gonna do. The Keystone Pipeline is part of that debate, but there is a broader problem as Gene mentioned. Countless pipelines across America are waiting to be built because of bureaucratic delays. One agency says yes, like Keystone State Department, go -- one agency says, no. Like, Keystone, the White House. And so nothing happens. Environmental issues are important for sure, but when they stifle production and jobs, that is where this Texan draws the line. This energy renaissance is a great opportunity for America, for our economy, our national security, our diplomacy. And as the Vice Chair in the Energy and Power Subcommittee and the Energy Commerce full committee in the 114th Congress, I look forward to working with all of you to make sure this reality becomes a true reality. Thank you.

[applause]

BILL SQUADRON: Thank you very much Congressman Green and Congressman Olson, I would like the panel to now come up. As they are coming up, I just want to make sure

everybody knows that by early next week, hopefully Monday, we will have a transcript available of the remarks today as well as a discussion for people throughout the country, all of you here who are already registered as participants on OurEnergyPolicy.org to continue the discussion. So the discussion we have today will then continue throughout the digital world and it will then at the end of that, at some point in time, create a summary and distribute it on the Hill. So with that, I'm going to turn it over to Amy Harder, who I'm sure all of you followed in her great work at the *National Journal* and now as the Energy Lead at *The Wall Street Journal's* Washington bureau, Amy?

AMY HARDER: Well, good afternoon, there were some great remarks by the Congressmen. I would like to throw a little bit of cold water on to that. Not even 50% of the country is even aware that we are in an energy boom, according to a recent Pew Poll. So I think events like this help to shed light on that, although I would guess that everybody in this room, 100% of us, are aware of that. So we have a great panel today to talk about this. To my immediate left is Steve Rattner, he's chairman of Willett Advisors, which is the investment arm, former New York City Mayor Michael Bloomberg and he's also the former head of President Obama's Auto Task Force. And next to him is Karen Harbert, she is the President and CEO of the Institution for 21st Century Energy at the U.S. Chamber of Commerce and she has held senior positions at the Energy Department over the years. Next to her is Elgie Holstein, Senior Director for Strategic Planning at the Environmental Defense Fund. And next to him is Joe Cannon, President and CEO of the Fuel Freedom Foundation.

And so I'm going to dive right into questions. We all agree that opening remarks could be forgone since we heard from the Congressman. So Karen, ladies first, question for you. How do you think the U.S. can leverage the oil and natural gas boom more than it is right now?

KAREN HARBERT: Well, I think that is a great question Amy and I think that there are some things that we can do in the short term, medium term and long term, so let me start with the short term and I will be really brief.

You know, I think it would send a very powerful signal if the administration would allow more exportive condensate. We are already doing it, we've got export license where the President has the authority, because guess who is exporting a lot of condensate? Iran. We exempted that from our sanctions on Iran, so we can tighten sanctions on Iran, cut off their access to the market and we could take up that spare space. That would send a powerful signal that we are in the energy business abroad. Secondly, I would like to see the President actually say, I'm going to come to an LNG export facility ribbon cutting and show up and cut it and say, you know what, we are in this business and we mean it. And I think for the longer term, I agree with what both members of Congress said, we are going to have a debate on oil exports for sure, it is an emotional issue, we are still importing oil, people need to be on board, the 50% that don't know that we are in an energy boom need to understand this. But that doesn't mean we shouldn't start and we should have that debate. Senator Murkowski is going to have a hearing on this, we should really begin it in earnest. In the meantime, we can prove that it is not going to increase the price of gasoline by doing some test sales. So there are opportunities right now on condensate, on a ribbon cutting, on some test sales, that would really show the international community that we are in this and we are

in it for the long term and we are going to use it very strategically for our partners, for Europe, for Japan, and begin those discussions right now.

AMY HARDER: Do you think the oil export ban needs to be lifted entirely? And just to confirm, that is something the Chamber supports, correct?

KAREN HARBERT: That is something the Chamber supports. But we also recognize that it's politically difficult, so we want that debate to happen. I do believe just because of the fundamentals of the market, we will do it. But we do need to bring the debate along a little bit. We do have that capacity problem, we are manufacturing the type of oil that we will eventually run into a wall and no longer be able to refine and we are not going to build a lot of new refining capacity. Maybe a little bit, but not big in the refineries in this country. So it's going to have to find its way to market or we are going to shut it in and if we shut it in, then we raise the price here for the American consumer and that would be terrible for an economy that is still trying to recover.

AMY HARDER: Steve, let me turn to you. Of course Mr. Bloomberg has been quite active in the energy and climate space, but I would love to hear from you about what benefits and also risks that the oil and natural gas boom and its climate implications present to the investment community broadly speaking.

STEVE RATTNER: Well, first, I'm not here to articulate Mayor Bloomberg's views on climate change or energy, he is more than capable of articulating those himself and he has done that, but I will speak from an investment point of view, because we do certainly look at it that way. Obviously there has been an enormous boom in not just production, but an exploration in spending and in raising of capital for energy projects in the U.S. and the need for capital here in order to actually achieve the kinds of projects that are on the drawing board is almost infinite, it is vast, the amount of capital and it has been flowing there. The challenge for the industry at the moment is going to be to manage much more volatile oil prices in particular than anybody expected. The companies that explore well in the sense of being good managers and stewards of capital and careful with their [unintelligible] tend to engage in fairly robust hedging programs, as probably many of you know that protect them against some of these swings, but you really can't fully hedge these kinds of activities. So there is an enormous amount of risk inherent in the business and what has happened in the last month simply accelerates that risk. I think you are already seeing a curtailing of drilling programs in this country as a result in the change in prices. Not necessarily so much because lower prices means that a well isn't profitable, but because many of these companies depend on cash flow from existing production in order to finance the next round of drilling. Some of them have leverage on top of that and therefore it's simply not within their means. There is a high level of risk for oil services companies that depend on drilling for their livelihood and you have seen already massive changes in their revenue streams that are going to have profound impacts, so it is a -- it is not a business that goes straight up and subject to a lot of volatility and we are seeing it now.

AMY HARDER: Great. Elgie, let me turn to you, realizing that you do only speak for EDF and not any other environmental groups. Can you characterize how the environmental

community has been responding to this abundance of oil and natural gas? I'm seeing it in a host of different ways -- opposition to Keystone, opposition to LNG Exports, I haven't seen as much opposition to crude oil exports, but I think that will come. How do you think that the environmentalists are responding to it and do you think it makes addressing climate change much more difficult in an era of fossil fuel abundance, as opposed to scarcity, which we thought we were in, up until seven years ago?

ELGIE HOLSTEIN: Well, it's true that all of the environmental organizations are not the same and I would have to say that from the standpoint of Environmental Defense Fund, we are not reflexively opposed to exports, but we do think that it is critically important to keep our eyes on the prize and the prize is the movement -- accelerated movement, if possible, toward a cleaner energy future and that doesn't necessarily mean no exports or no international trade in America's new found bounty. But what it does mean is, approaching that bounty with seriousness of purpose with respect to ensuring that we maximize efficiency that we address the demand side of the equation as we, I think, have been doing aggressively in recent years in this country. And of key importance that we are continually looking at the impact of new and expanded sources of energy, of conventional fossil fuel energy, on the climate and in that regard, for example, and maybe we will talk about this a little bit more later, but looking for example LNG Exports, we would propose and feel very strongly that expanding international trade in natural gas can have, under certain circumstances, a positive impact on climate emissions, but only if we pay close attention to the entire natural gas supply chain and the leaks of methane from that supply chain. We think that is a problem that its possible to get our arms around scientifically. We think it is possible to measure and we have been sponsoring studies to do that. The next step is to address the technology needed to do it. Finally, on that point, I will say that the work that we have sponsored, which has been peer reviewed and conducted independently, shows that just looking at the supply chain, for example, in the United States, of our natural gas system, that we can get above 40% o more reduction in methane emissions from that supply chain at less than one penny per MCF of natural gas produced. So we think that this is an example where addressing the externalities of the rapidly expanding gas sector is achievable and is cost effective and not, if I may anticipate some objections, and it does not need to be set aside simply because there are of the fluctuations that is in the energy markets that Steve has referred to.

AMY HARDER: So would it be accurate to say that you think natural gas is in that benefit to addressing climate change as opposed to --

ELGIE HOLSTEIN: No, it would be more accurate, I think, to say that we think it can be in that benefit to the climate, but only if we address and are very careful about methane leakage. So to put a finer point on that, if we were talking for example about LNG Export facilities, we would feel very strongly that in designing and building those facilities that they should have state of the art leak detection and repair equipment and protocols so that those facilities aren't needlessly leaking methane into the atmosphere. Now, that is only one part and for the immediately foreseeable future, a relatively small part of the natural gas supply chain, but what goes for -- what the opportunity there is, that we are building new infrastructure now to transport gas an perhaps ultimately to export gas in much larger

quantities. And so now is the time to be thinking about those opportunities instead of coming back ten years from now and saying, gee, wouldn't it have been great if we had built all that new capacity with stronger environmental values in mind?

AMY HARDER: Great, so Joe, let me turn to you and this might be a question, I want to open it up to the others as well. But just a little background on his organization. I know you work with tech innovators and scientists and elected officials to try to have a truly competitive transportation fuel market. I can only imagine that the oil boom has really made that significantly more difficult, especially with these plummeting oil and correspondingly low gasoline prices. So how would you characterize how the oil boom has made your job more difficult?

JOE CANNON: Well, for most of the time I have had this job, oil has been at \$100 a barrel, okay, so it's had a sharp decline just recently and who knows what the whole future is going to be. Our mission is basically -- well, we have a broad mission -- we are full agnostic, but we are looking particularly at how you can introduce the abundant natural gas that we have, into the transportation system. So that would be a truly revolutionary move in terms of energy security, in terms of the environment, in terms of the economy. So we think you could take natural gas and it could be in a number of forms, but you can make ethanol and methanol from natural gas, we believe, more cheaply than gasoline and if that could be introduced into the transportation system, you would have a category change in our domestic energy policy. How the current prices affect that? I don't know, but over the long period, over looking at the -- where we have been and where we could be going, we think getting more natural gas into the transportation fuel system would be very beneficial.

AMY HARDER: Great, let me open it up to the whole panel and broaden that question out a little bit. What do you think are the policy upshots to these low oil and gasoline prices? That is really the biggest story on my beat at the moment and really, that is a direct result of the U.S. shale boom, of course OPEC's decision not to cut production, has helped drive prices down. Many policies put in place over the last ten years or so, were premised upon high gasoline prices. How can this change in the equation? I will open that up to anybody who has some comments?

KAREN HARBERT: Well, you are right, I mean, energy policy began after the oil embargo in the 1970s when we were vulnerable, we thought we were running out and we wanted to protect ourselves, so we immediately put a ban on oil exports, which still stands, obviously as we just discussed. We put price controls on natural gas and that has since been undone, but our paradigm, our energy policy, has not changed in the last couple of years to embrace this era of abundance and if you look at -- just on the transportation fuel side, we have got 900 million cars on the road today around the world and the next ten years that is going to go to two billion cars. So we are going to need a whole lot more transportation fuels. And if we want to be a bigger part of that market, because we are already showing in an era where we have got Iran and Libya and Iraq and Arab spring and Arab winter and Russia and what they are doing, that we actually are the part of the market that is smoothing things out. And that is really good for our economy, it's good for the world's economy, but we are looking at our economy. So if we want to be a bigger player in the market, we

actually need to look like that and have the policies to reflect that. So in our view, that means we should open up more areas for exploration, because the demand growth documented by the international energy agency is going to be over 50% growth over the next 30 years. So the demand is there.

AMY HARDER: But do you think the prices are too low? I mean, companies are shedding in wells.

KAREN HARBERT: The low price environment is because it's reflective of the market out of balance at the moment. It will rebalance. I mean, we have 30 years of history to prove that. So oil prices will come back. They are not going to be \$140 because we are a bigger player. But we should be opening up areas, we should be looking at how to be that player in the market that is exporting. We should actually want to be the energy super power and if we looked at it very strategically and we look at North America -- Canada, the United States and Mexico, all of a sudden the market that we used to understand, which was OPEC was supply, the United States is demand, that is no longer the paradigm. We can be the supply and the other parts of the world can be the demand and that would fundamentally change the market forever.

STEVE RATTNER: Let me agree with a lot of it, but not necessarily all of it. I think the first question that you have to ask just to sum this up is, do you believe the current pricing environment is an anomaly or do you think it's a new normal? If you look at the future's market, for whatever value that is and I wouldn't overstate the value of the market, but it is a market -- the market basically is looking at \$80 oil as you get out there. They view this as a temporary event and in fact, the future's market really hasn't moved much at all, because when oil was \$100, the futures were also around \$80 or \$82, they have moved down a little bit, but not a lot. So the market basically believes that we are not in a world of super abundance. That as Karen said, demand is growing all over the world, OECD demand is pretty flat, but the developing world demand is still growing and it's gonna grow. U.S. production is increasing, but if you look at the longer range forecast, at some point it will peak again, at least that is the current thinking, and then begin a decline. So I think our energy policy has to be oriented around that fact. That for the foreseeable future, we are going to be dependent on oil and natural gas as primary sources of fuel, that unless we want to substantially alter in a downward way, our economic growth trajectory, we need to embrace that, accept it and nurture it. I'm totally onboard for the environmental aspects of this and being careful about how we do all of this, and we can debate those specifics or at least other people can, I'm not an expert on the environmental part of it, but it's clear to me that our policy should continue to change to recognize those realities. So that means expediting LNG Exports. Not necessarily just a ribbon cutting, but actually changing the permitting process in a way where we do more of it, that is probably our single biggest way of having influence over the rest of the world, would be to become a supplier of large amounts of natural gas to the rest of the world. It means eliminating the ban on exporting crude, which I think would have zero effect on gasoline prices and would essentially just make the markets more efficient, it's not going to change the worldwide price of crude, it's not going to change the price of gasoline, it's going to take some money away from the refiners who don't deserve it and have it go into developing production in the U.S., which is

what we want to see have happen and I would certainly continue to think about renewables and nuclear, not so much about coal, but I would have an energy policy that is oriented toward the fact that our demand for the use of energy is going to continue to grow, the world's is certainly going to continue to grow and we live in a worldwide commodity pricing environment and so unless we do our part to create supply as well as doing things on the conservation side to try to keep demand growing at relatively slow rates, I think we could end up in the world of oil and natural gas prices escalating faster than we would like to see them do that.

AMY HARDER: Joe, you had some comments?

JOE CANNON: Yeah, a couple of comments. One is that one of these structural changes and big differences in the -- our energy environment is the -- sort of the breaking, the busting of the petroleum and natural gas pricing. So for long years, oil and gas prices were in rough parity, you know, gas had an advantage there, but starting just three, four, five years ago, you see a very dramatic change -- and I think it's a structural change, in terms of the price of energy on a per BTU basis and I think any policy that doesn't look at that and figure out how to take advantage of the cheaper price per BTU of natural gas, isn't as good a policy as it should be. So just -- that is one point in terms of the prices. The prices aren't moving exactly the same and they are structurally different from how they have been, so I think a policy needs to look at, how do you take advantage of those cheap BTU's?

ELGIE HOLSTEIN: I'm a little surprised that no one has mentioned OPEC so far in this discussion because -- so, OPEC's recent decisions about its output quotas goes right to the heart of really the old paradigm and reminds us that notwithstanding America's new found bounty, the OPEC nations and in particular Saudi Arabia, still retain both economic and political opportunity and interest in maintaining market share and in other geopolitical ways that they influence international fossil fuel energy markets. Secondly, and I think that that role, given the enormous size of their low cost reserves pretty much says that, while the United States is likely to be in a position to play more in international markets, it's going to be OPEC for the foreseeable future that people on Wall Street and in investment circles around the world will be continuing to watch very keenly as those nations make strategic judgments in their own economic and political self-interest. Secondly, I would say that with respect to LNG Exports, we have to keep in mind that although we have this enormous new bounty of natural gas, it is here, it is not over immediately adjacent to many of those markets and we are faced with many competitors around the world, some of whom are catching on to hydraulic fracturing themselves, many of whom have designs on vastly expanding their gas exports to meet new demand in Europe and Asia. And so I think when you factor in the -- and numerous studies are showing this, when you factor in the transport costs associated with exporting American gas, we are not talking about huge volumes of gas moving out of the United States any time soon. Not simply because of this competition, but also because of the net back of the transportation costs. So there are factors that will continue to limit our ability to influence international energy markets, but clearly we are a new player on the scene or at least a player that is on the scene in ways we haven't been before. But I think OPEC has just demonstrated that they are prepared to play rough with the new kid on the field and we will have to see how that shakes out. I think the message to

us then, is the same message we had under the old paradigm, which is, it is critically important that we diversify our fuel sources, which is why I think this conversation about how we fuel the vehicles of the future, that both Joe and Karen have been talking about. Natural gas may be an important way to do that, hydrogen may be another. Just as recently as seven or eight years ago, it was very common, including in the environmental community, to say that the internal combustion engine was seeing its last days. That the technology was as mature as it was going to get and that if we were going to see any more efficiency improvements out of vehicle fleets, the ones we have as well as the ones we are going to have, it was going to have to come about through other fuels. Other fuels are definitely part of this discussion, but I think the automobile manufacturers are showing a remarkable ability to innovate and just looking at things like nine speed transmissions, for example --

AMY HARDER: And I think low gasoline prices help that.

ELGIE HOLSTEIN: And oil and gasoline prices certainly contribute to that, so did café standards, so did expectations, so did concerns about climate change. So in some senses, the lessons that we learned under the old paradigm continue under the new paradigm as well and the importance of maintaining a focus on constantly improving efficiency as the low hanging fruit, remain very strong and important themes, I think, in future energy policy making.

AMY HARDER: So we have mentioned the oil export ban, which of course was put in place in the 1970s in response to the OPEC oil embargo as Karen mentioned. Most of our laws are based upon decades and this energy scarcity conventional wisdom. The natural gas act of 1938 is what governs our LNG exports. An Executive Order that President Johnson signed in 1968 is actually the basis for how the State Department reviews cross border pipelines such as the famous Keystone XL Pipeline. Do you think these laws need to change in order for the U.S. to really capitalize and respond to the oil and natural gas boom? And a subset question to that is, do you think that Congress needs to step in and do that? Or does the administration have enough legal power and political will to do it itself, either this administration or whatever President we have in 2016. I will open that up to the whole group. Somebody have any thoughts?

KAREN HARBERT: Well, clearly on some of those, the administration today has the authority; I don't think they have got the political will. And so for the investment community that Steve was talking about. For the durability, for the certainty that the investment community will need for a policy framework that will ensure that their investment can flourish, I think we do have to update it. We might call it the Energy Abundance Act, whatever, that would do a number of the different sets of policies that we have here. But we also have environmental policies that have legacy in the '70s and the '90s that also have to be brought up to date that we are contorting to try and fit today's environmental realities. So we do. I mean, Congress is the one that has the authority to do these things and they should do them. It is not going to be easy and I don't know who is going to be sitting in the Executive Branch two years from now, but it is clearly something we need to do to capture them. I think we are really at the beginning of this abundance and

if we open it up and really capture that opportunity, it is going to require a paradigm change. I also think the narrative has to change and to Elgie's point about what is the environmental community's response to this? I say to my friends in the environmental community all the time, I think the conversation for too long has been, it's energy or the environment. And so we have pitted interest against each other. That you are either going to have energy or you are going to have a cleaner environment and address climate issues. I think now with the 50% of the American people that do know about this energy boom and that is only growing because of the jobs that are being created, all over the country, not just North Dakota, not just Texas, not just Oklahoma. We now have 31 states that are producing energy. We now have two million new jobs in this country just because of unconventional -- people look at this through their pocketbooks and so I think the conversation to evolve into energy and the environment and how do we do this in a symbiotic matter? And I think the energy industry, which is terrible at telling it's own story, is really the new high tech industry. It is no longer Silicon Valley that is high tech, it is Denver and Houston. That is where innovation is coming out and it is coming out at a pace and scale that rivals anything and any industry that our country has ever seen. And so, I think the environmental industry has a role in embracing that high tech approach to this, because it will address some of their concerns and it can show that we can have a healthy economy, we can grow it, energy can be a platform for growth, because there is no poor economy that does anything good to the environment. So I think the conversation has to change because I don't think we are going to be willing to see \$4.50 gas, we are not going to be willing to see electricity's prices go through the roof and high tech is really the way to address that.

STEVE RATTNER: You asked about policy changes and I think there is one big one we haven't talked about that I think frankly dwarfs whether we change the Natural Gas Act of 1938 or not, which is that this would seem to me and there will probably be some disagreement on this panel, which I suspect you would welcome -- this to me would seem to be the absolutely ideal moment to start to institute carbon taxes of one sort or another on our use of carbon. [light applause] Oh, I got some agreement. But you know, you have gasoline prices that could well drop below \$2.00 a gallon in some parts of this country. We have talked about all of these aspects of it. And if ever there were a moment when people ought to be able to accept the idea of raising a gasoline tax that hasn't been raised in a long time and is way below where it has ever been on an inflation adjusted basis and certainly way below where it should be and to institute carbon taxes on emissions and things like that, use some of the money to rebate to people who are -- less wealthy Americans who are adversely affected by it so that they are not adversely affected and then use the rest of it to deal with things like the fact that our Highway Trust Fund is about to run out of money and crumbling infrastructure, all of the things that everybody here knows about. This is all pie in the sky, it's not going to happen, especially given the composition of the new Congress, but if you ask the question, what should we be doing as opposed to what is likely to happen, that would be absolutely at the top of my list. I know enough for my --

AMY HARDER: Now, is that a carbon tax and a higher gasoline and diesel tax? All three?

STEVE RATTNER: You know, look, I think we could debate exactly what to do. You can debate the forum, for example, on a gasoline tax, it doesn't have to be a fixed number of

cents per gallon. In fact, it could phase it, it could be a kind of accordion like thing that has - when oil prices were low, the tax was higher, when oil prices were higher, the tax was lower, so that the price at the pump didn't fluctuate as much. There is a lot of ways to design these things and I'm not here to lay out a specific bill that should be adopted, but it seems to me obvious that this is the moment that we should be doing something like this. One of the things that I learned during my time on the Auto Task Force is that the café standards are an extremely heavy handed way to achieve a very desirable outcome, i.e. more fuel efficiency. They create all kinds of distortions. We may end up with nine speed transmissions out of it, but it's coming at a pretty high cost to consumers in terms of what the auto makers have to do in order to meet these standards and you talk about high tech, some of it is cost effective, a lot of it is really not cost effective and doing it through tax policy and letting the market decide what kind of cars people buy, by making sure that you use tax policy to achieve the desired result from a guy who lives in the investment world, is a much more efficient way of doing it.

I just want to say one last thing, which goes back to what Elgie said, just to underscore, because I think it's an important point. We were all talking about LNG Exports and this and that to improve America's level of influence in the global energy world. But at the end of the day, it is still on oil. It is still OPEC's show and it's going to be OPEC's show and what we are seeing happening now is to some modest degree a function of the increase in U.S. production, but it is heavily a function of the decision by OPEC simply to go in a different direction. We can all speculate about the reasons. You know, the supply/demand imbalance of the world today is not huge, it's a million barrels, maybe it's two million barrels, it's not a number that is anywhere outside of OPEC's ability to control the pricing if they chose to. OPEC is still about 40% of the global oil market, they still have plenty of pricing power, they are just off marching to a different drummer at the moment. I just wanted to underscore that.

AMY HARDER: I think there might be more agreement on some sort of gasoline or diesel or carbon tax. So just very quickly, I would like to get the panel's take on that. Obviously we could debate all day the specificity of what these policies could look like, even though Congress won't actually address them, so we probably won't get into that, but just for argument's sake, Karen, does the Chamber support either or a gasoline, diesel or carbon tax?

KAREN HARBERT: The Chamber represents the entire business community and if we can't move our products, we are useless. And we look at our crumbling infrastructure and it supports its bridges, its highways, it's everything else and with café standards, people are now driving -- they are paying the same as they were, but they are far more efficient. So we are broke. The Highway Trust Fund is broke. We have to do something about it. Now, Congress would love to raise the Highway Trust Fund and have that money just go into the general treasury, right? But if it's actually going to do what it's intended, it goes back into road infrastructure. We have been for that. With the corollary that there needs to come some other things with it, which is permitting reform; it is very difficult to get anything built in this country right now. If it takes -- you know, there is a transmission line from a company that I will not name that is not too far from here, it's 130 miles long and it took 18 years to

build that transmission line. Now because they built it inch by inch, but because it took 16 years to get the permits to cross the borders.

AMY HARDER: But just to be clear --

KAREN HARBERT: But if we have a Highway Trust Fund tax that goes up and we can't do anything with it, what is the point? So I'm saying we have to address it holistically.

AMY HARDER: But the Chamber does support higher gasoline and diesel taxes, correct?

KAREN HARBERT: Correct.

AMY HARDER: What about you Elgie, what does EDF support? All three?

ELGIE HOLSTEIN: Well, I should never have let Steve be the first to talk about the need for putting a price on carbon and I think the question of how much of that price should be recovered through gasoline taxes and then that gets us off into what if the infrastructure choices are that we need to make, the budgetary choices and those are all important discussions. I think it's important to keep the focus at a very high level, which is, we need to price energy in ways that capture the externalities that is particularly efficient if you are going to use a carbon tax. As a way to do that, I think Steve's suggestion and others have made similar ones to rebate some or even all of that tax to consumers, helps you enormously from a political standpoint. So I think it's much more important to focus on the high concept, which is that we can design a price on carbon in ways that are not punishing to the economy and if we do it in ways that are explicitly linked to a federal policy that puts the kind of emphasis on technology, development and deployment that Karen was talking about, we further increase the efficiency. I just want to pause on that point because I wanted to cheer when Karen made it, because so often in these debates about environmental regulation, what one hears is, this can't possibly be done because it's unaffordable. It's unaffordable for industry to make the improvements necessary and the way they do business and their equipment, in the way they build things, its just not doable. And the problem with those arguments is that they all are premised upon a complete standstill in the evolution of technology in this country and the idea behind putting a price on carbon is that you stimulate that innovation and I think what is going on in the solar community right now, the solar sector, is proof of that. Solar prices are continuing to drop and they are dropping by enormous amounts with every passing year. So I just offer that as an example, not as a panacea of the difference that technology change can make and you accelerate that innovation and that technology change when you put a price on carbon, as well as addressing the overarching problem of climate change.

AMY HARDER: And please be thinking of questions. We will pass it over to you in a few minutes, so please be thinking of questions you would like to ask the panelists. Joe, I wanted to ask you, do you think any sort of increase in the gasoline and/or diesel tax, and/or carbon tax could help diversify the transportation fuel mix?

JOE CANNON: So the Fuel Freedom Foundation doesn't have a position on increasing taxes of any of those kinds -- not for or against. We recognize there are many big elephants stomping around in that field and we are fairly small, pretty highly focused view. We do recognize, we have run into it because we have got some projects going in three different states, that as we get more fuel efficient, as we use different fuels, as we use more electricity, that puts an increased burden on how you get money for roads and highways. And so in some of the legislatures we are working with that and we are definitely open to somewhere down the road making sure that alternate fuels bear their burden going forward, but we don't have a particular position on it.

AMY HARDER: So panels like this in Washington love to talk about things like the carbon tax that make to some people, economic sense and environmental sense. But yet, we all know that Congress won't be passing a carbon tax any time soon. Perhaps maybe there are some bills being introduced that are raising the gasoline and diesel tax, but I think we are all in agreement that passing that anytime soon is probably not going to happen. So let's talk for a moment about the art of the possible for next Congress, with the Republican controlled House and Senate. Can you name one, maybe two pieces of legislation that have either already been introduced this Congress or might be next Congress? That you think could actually pass both Chambers of Congress, which won't be difficult of course if Republicans are in charge of both, but then President Obama might actually sign.

JOE CANNON: I can't think of a -- I don't want to name a specific piece of legislation, but I do think this issue that we are talking about, happens to be one of the few, possibly the only shaded area in multiple VENN diagram here, where you can get Republicans and Democrats, Liberals and Conservatives to agree that you can do something with the abundance of natural gas that we have in the transportation system that benefits the environment and the economy and national security and let me just give an example -- both Steve and Elgie talked about café standards and the internal combustion engine. As a matter of fact, it's going to be very hard to meet the new café standard with the existing internal combustion engine. So I apologize a little bit for getting granular here, but it's kind of an important point. The cheapest way to get the kind of reductions out of the transportation fuel system, GHG reductions, out of the transportation fuel system, is to have a higher compression engines with some electrification in the automobiles and we've got a study and I won't go into the whole study, that shows how that is the cheapest, fastest way to get significant GHG reductions out of the transportation sector as is your don't get big reductions there. So to meet the 80% reduction, you need to do something with the internal combustion engine to get a higher compression engine; the cheapest way to get there is more octane. The cheapest octane is alcohol fuels and all of the car companies are looking at how to increase alcohol fuels -- alcohol in the fuel system, so that you can get that higher compression engine that gets you that café MPG. So I don't know how to put that in a piece of legislation, but somewhere out there, there is something that could look at café, how you increase the use of higher octane and what kind of credits the auto industry would get for implementing this in terms of the café standard. So you get something that there are winners all the way around. I know we don't have time in this panel to really get into the weeds, but there is something that is worth talking about that gets café, gets GHG benefits and gets economic benefits and benefits to the car industry and the consumers.

KAREN HARBERT: I think there are. I think we have to be realistic that there is going to have to be something that is digestible. The idea that we are going to get big, omnibus energy access, probably not, but I think there is probably agreement on a couple of places. The R&D tax credit, I think there is bipartisan agreement that that is a good thing and that will continue to spur innovation and technology development. I think there is bipartisan agreement on energy efficiency legislation that has taken form with [unintelligible] or whatever that looks like in the next Congress. I do think you are going to see bipartisan agreement on clarifying and expediting in an appropriate manner the L&G permitting part of this and then I think there are two other places where there could be and there should be - - and we will see how this pans out, because parts of this have already passed the House, we will see if it ever gets to the Senate with Republican takeover and then ultimately what the President thinks about it. But one has been in regulatory reform and bringing more transparency to the regulatory process and holding Congress a little bit more accountable of weighing in on big cost regulations and bringing more transparency and you would think that the President would be in favor of transparency into the regulatory process, so there is possibilities there on reg reform, because if you look at the pace and the scale of regulations coming out of the administration, I think that it bears all of us some concern that we need some transparency into these. And the other part would be permitting reform. And not because of Keystone, but because we have to build a lot of infrastructure to move, whether its wind and solar to market or whether it's gas around the country, we need to be able to do it in a way -- and Canada passed permitting reform, they said from beginning to end it's two year on an environmental review. You get a yes or a no answer. And that is great for the investment community, but a review that takes six, seven, eight, ten, 18 years is a terrible way to build infrastructure that is crumbling in this country. We need a lot of new of it. So I think there could be a great deal of agreement on permitting reform that would allow some certainty. Would put a lot of people to work and would create new investment opportunities and for new companies to invest in here because we have very efficient infrastructure, which is why a lot of European companies are investing here, because we do. But I think those are the areas that immediately would have some opportunity, whether you could actually put them all together, it might be too clunky, but I think there really are some opportunities there.

STEVE RATTNER: Well, I don't want to rain on the parade, but I'm going to take the under on the over-under of what Congress is actually going to do over the next two years and I think the first couple things you mentioned all seem possible, plausible, because there is a lot of agreement around them, but not to get us off the subject of energy, or into politics or Congressional processes, but remember that even with the Republican takeover, you still need 60 votes to get most pieces of legislation through and then as both Amy and Karen have pointed out at different times, you still have the President, but the opportunity to weigh in and we are in the seventh and eighth years of Presidency and we are facing Presidential election. So I think it's going to be pretty small boar stuff on which there is very broad agreement and all of the things that I think there is surprising agreement actually in this panel, probably on a lot of it, the big stuff that we would all like to see have happen, I think we are a few years away at best from progress there.

AMY HARDER: Elgie, do you have any comments?

ELGIE HOLSTEIN: I don't know whether its two years or four years, but I do think a bipartisan consensus can emerge and possibly even from the upcoming Congress, and I say that for two reasons. One, its been seven years since we have seen a comprehensive energy bill pass the Congress and signed by the President. And we in the meantime are experiencing a long list of things associated with our energy boom in this country and some things that are tangential to it and Karen gave a great list of some of those items. But the way we have always passed large energy bills is, for better or for worse, is that everybody gets something. And I think it's very possible and I think Steve was just hinting at this, to think about the kinds of things that ultimately could be acceptable to the environmental community in exchange for getting other things from out of folks in the fossil fuel industry, for example. So let me mention one or two things Karen didn't mention as possibilities. One of them is a revisit and more sober view of the Department of Energy's Loan Guarantee program which of course became a political football a couple of years ago as a result of the Solyndra episode and yet the DOE portfolio, the Loan Guarantee portfolio, has experienced a loss rate lower than that of the private sector for equivalent sector investments. And so I would expect that one area where Democrats and Republicans could come together is thinking about expanding the Department's Loan Guarantee authority and having a lively discussion about having a broad range of technologies qualify for that kind of support and I think Secretary Moniz has done a good job of articulating that thousand flowers blooming approach and I think we could see more of that kind of thing and maybe even explicitly for nuclear power for example as part of such a sprawling bill. So I would be very disappointed and maybe I should be, but as an environmentalist, I'm supposed to be optimistic, but I would be very disappointed if the Congress fails for another five years on top of the seven we have already been through to pass some bolder plans than just Shaheen Portman. It's embarrassing enough, perhaps, that -- or unfortunate enough that Shaheen Portman didn't make it through, but it's high time it did, but as Karen has articulated, there is a long list of other things that have been waiting in the wings for a long time.

AMY HARDER: And even Shaheen Portman was watered down significantly. I like to call the lowest common denominator of energy policy. Lets take it to the audience now for some questions. I think we have some microphones going around. So please say who you are with and your name and -- so please walk up to the microphones if you have any questions.

AUDIENCE MEMBER: Hi, my name is Denisa Scott, I am a fifth generation Texan, thank you and just referencing our opening speakers. I grew up in Texas oil. My question for all of you is a bit of a topical squirrel related to what we have been talking about, as fossil fuels as a combustible consumable. Are there any policies in anyone's strategy that you can address that would speak to using fossil fuels as a natural resource for manufacturing technologies to capture renewable energy fuel cells, batteries, whatever, and also in increasing the efficiency of our materials -- plastics and other synthetic materials that we use in our transportation technologies.

AMY HARDER: Does anyone want to tackle that?

JOE CANNON: We are all about transportation. I mean, I have -- as a regular person, I have thought about manufacturing, but we are about using natural resources in a transportation system and as I have already said repeatedly, figuring out ways to introduce natural gas derived fuels into the transportation system -- it would be one of the biggest ways to change that. I mean, that is a huge market. It's the single biggest market for petroleum and if you could introduce natural gas into that, that would make a very substantial difference. It's not making anything in the way you are talking about it, but that is our view.

KAREN HARBERT: I guess maybe I would look at it slightly differently and I'm speaking to a very well educated audience, so I will ask for forgiveness in advance, which is, because I think more than 50%, probably 90% of America doesn't realize what petroleum is already in. I mean, it is in this. And I don't mean the water, I mean the vessel. It is in -- you to the hospital, it's in your IV tubing, it is in your shoes, it is in everything, so the oil and natural gas industry is always innovating of ways to apply its product to common day American goods because it is a fundamental feedstock and how can they do it more efficiently? Are there other ways they could be a part of the supply chain? So maybe that is not quite the answer you wanted -- it's not, you know, are we going to see the Texas oil fields be the battery storage of the future for wind and solar, I mean, I don't know the answer to that. Maybe somebody in a DOE lab is looking at that or somebody else. But they are always looking and I look at some of the more capitalized integrated oil and gas companies and they have huge research centers, not just to make their own exploration production more efficient, but to look at other applications for their products and so I think that is what they are focusing on and I'm sure that didn't answer your question, but that is all I got. By the way, I went to school in Texas too.

AMY HARDER: Question over here?

ELGIE HOLSTEIN: May I just respond? I will be very brief. I think that one of the great temptations would be for Congress to try to choose a technology winner in this arena. I do think that going back to the previous question, that if I were drawing up a list to add to Karen's about things that I would like to see Congress take up, alternative fuels infrastructure financing or revolving fund or something of the like, is certainly on that list, but I think it would be a big mistake if Congress were to have a big fight over which transportation technology should be the winner and I think it's interesting that the automobile industry itself is diversifying its R&D aggressively, looking at a variety of different approaches to fuels of the future and I think Congress should take a lesson there and be cautious about deciding that one particular approach is the transportation solution for the rest of the century.

AUDIENCE MEMBER: Hi, I'm Michael Tubman, from the Center for Climate and Energy Solutions. Thanks for the great discussion. Karen, I was really struck by your comparison that Houston and Denver are the new Silicon Valley and it made me think about whether or not there are opportunities for the fossil fuel industry to be leading in some of the reductions in green house gas emissions that are going to be necessary over the long term as we are experiencing this period of growth. One of the things that we have been looking at

C2ES is the potential for enhanced oil recovery to be using anthropogenic CO2 to advance oil production while advancing CO2 capture technology. I'm wondering if there are other areas where you all see their potential for the fossil fuel industry to lead in our fight against green house gas emissions and whether there are government policies that could help the industry along the way.

KAREN HARBERT: That's a great question and I think if we take stock today of where the R&D efforts for the industry have gone, certainly it has been in more efficient -- the primary purpose in the beginning was more efficient production exploration and they immediately went into EOR and now they are looking at different ways of EOR transporting CO2 and we have got the big pipeline that goes up to Canada that is proving actually that you can be far more efficient with the oil sands, with the CO2 that we are bringing out of Texas. And so there is huge applications and I think they can lead. We have a saying that we use now that ET is the new IT, energy technology is the new IT, I mean, IT has transformed our ability to see what we have underneath our feet and now ET needs to take that over and actually transform it a step further. You know, the 2.0 version of this, and looking at the ability of recycling water constantly in fracking and that reduces the need for water. We are looking at the ways that we could use EOR in a very different way and different parts of the geology. So I absolutely do and if you look at one industry overall that is investing more in R&D than any other, it is the fossil fuel industry and maybe they are self motivated, but they are certainly investing more than the federal government is and I'm not saying that is a good thing, but that is just the state of play at the moment. And so I -- we completely agree that there are more opportunities rather than fewer for new technologies to not only advance efficiency but to provide new ways of production and utilization as well.

AMY HARDER: Great, I think we have time for one more question.

AUDIENCE MEMBER: Thank you, my name is Richard Hoy, I'm a retired firefighter, I'm into wood energy advocacy locally. My concern as a firefighter or a first responder on day to day events as well as disasters is that our energy policies are disastrous. I am involved in that lives lost every day on the highways, partly responsible from our energy policies, it's a war, it's a loss of a major world war to this country. Technologically hubris is one of the things that is in the face of firefighters and first responders every day. So I look on this debate, this discussion as a little bit off center, off target. We should be looking at what does society need and how can society be served and not by what can a possibly temporary abundance of a particular product be employed. So I am very concerned about a vertical integration of any sort of basic societal need.

AMY HARDER: Do you have a particular question for the panel?

AUDIENCE MEMBER: Yes, so I would like to see the panel discuss how we can integrate policy on a broader scale into the energy debate here such as a carbon tax and integrating the externalities that are basically being discussed as an afterthought.

AMY HARDER: I know we discussed this a little bit before. Karen, can you speak to whether or not the business community and to what extent they think we need to internalize the social cost of carbon emissions?

KAREN HARBERT: Well, now the federal government mandates that we do in all of our regulations, which forces the business community to really look at it in terms of it's business model. First of all, thank you for your service as a firefighter and first responder. I just might answer it in a different way and I'm going to turn to Elgie if he wants to take it on because he has been speaking about externalities a little bit. I have spent a lot of time outside of Washington and I was struck by a place that I was in, in Pennsylvania which is sitting right on top of the Marcellus Shale, a very under resourced part of the country where the steel industry was and had left. They didn't have a lot of revenue coming into the county. Based on the boom, if you will, that happened in Pennsylvania, one of the ways that the governor distributed the revenue -- and keep in mind, it 2012 this new fracking had brought in 61 billion dollars of new revenue, 30 of which went to the state, so it was about evenly split. That is about to double to in the next ten years. So governors will have a whole lot more money to invest in education, but I was really struck in this county, is the first thing they did was re-up everything and improve the infrastructure for the first responders, because that was what they decided was their priority. So as a community, as a rural community, there are places all across this country that are going to be re-developed and priorities are going to be adjusted. Our education system will be invested in, our first responders will be invested in, as they should be because they have been under invested in for some time. If we can do it on the back of this energy boom and do it safely, do it responsibly, that is a tangential benefit, but a tangible one as well.

AMY HARDER: Elgie, did you have a very quick response?

ELGIE HOLSTEIN: Yes, very quickly. Richard, I'm going to take the part of your question where you said we should really think about what society needs and at a very high level, I think that is energy supplies that are reliable, that are affordable and that are secure and I think the point that I have been trying to make today is that the definition of security needs to be expanded not only to include the security of supply, which is the way in the old paradigm that we were speaking of earlier, we tended to think of our energy problems, but a new paradigm that expands that definition to include not only our economic future, which has always been so tied so closely to energy, but also the security issues associated with the environment and climate change, notwithstanding, the debate in Congress, climate change will make itself known in harsher and harsher ways the longer we delay taking that on. And putting a price on carbon is the most economically efficient way to bring about that new energy security that we need in this century.

AMY HARDER: Great, I would like to do one last lightening round question before I hand it over to Bill. In one quick sentence, what do you wish you could have told yourself six years ago about the changed energy landscape? Joe, I will start with you.

JOE CANNON: Wow, six years ago I wish I would have known about the vast abundant new resource of natural gas and the cleavage of price per BTU.

ELGIE HOLSTEIN: I wish I had known more about the impact that methane escaping from the natural gas system has on the atmosphere so that we would have those intervening six years to educate policy makers and the public industry and others as to the impact that it has and the role that it plays along with carbon.

AMY HARDER: That's what I call a run on sentence. Karen?

KAREN HARBERT: A little bit about what Joe said, I wish I had known about the coming energy abundance and boom so that all of the import terminals that we were rushing to import, we probably wouldn't have done that and we would have thought more about export terminals.

STEVE RATTNER: I will just echo Karen and Joe, I think clearly this dramatic change in our supply picture for both oil and gas, I don't think any of us six years ago imagined was possible.

AMY HARDER: Great, I would like to thank the panelists, turn it over to Bill.

BILL SQUADRON: That is a great question, I wish I knew the San Francisco Giants were going to win all of those World Series, I would have made a lot of money. Can we have a hand for a great panel discussion and Amy Harder? Thank you very much for moderating it.

[applause]

I would also like to thank Mike Speack and Brad Townsend who are the key staff people for OurEnergyPolicy.org and helped put this together. I would like to encourage all of you to follow and participate in the conversation that will continue from today online starting next week on the site, also take advantage of the resources there. Lunch is served out in the Atrium, thanks to all of you for taking the time to be with us today and we hope to see you again soon. Thanks very much.

[applause]