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``THE AMERICAN ENERGY INITIATIVE: A FOCUS ON THE FUTURE OF ENERGY TECHNOLOGY WITH AN EMPHASIS ON CANADIAN OIL SANDS''

TUESDAY, MARCH 20, 2012

House of Representatives,

Subcommittee on Energy and Power

Committee on Energy and Commerce

Washington, D.C.

The Subcommittee met, pursuant to call, at 10:05 a.m., in Room 2123 of the Rayburn House Office Building, Hon. Ed Whitfield [Chairman of the Subcommittee] presiding.

Members present: Representatives Whitfield, Shimkus, Terry, Bilbray, Scalise, McMorris Rodgers, Olson, McKinley, Gardner, Pompeo, Griffith, Castor, Engel, Green, and Waxman (ex officio).

Staff present: Charlotte Baker, Press Secretary; Michael

Beckerman, Deputy Staff Director; Maryam Brown, Chief Counsel, Energy and Power; Allison Busbee, Legislative Clerk; Garrett Golding, Legislative Analyst, Energy; Cory Hicks, Policy Coordinator, Energy and Power; Ben Lieberman, Counsel, Energy and Power; Carly McWilliams, Legislative Clerk; Phil Barnett, Democratic Staff Director; Caitlin Haberman, Democratic Policy Analyst; Angela Kordyak, DOE Detailee; and Alexandra Teitz, Democratic Senior Counsel, Environment and Energy.

Mr. {Whitfield.} I would like to call this hearing to order this morning. I might say that this is the 17th day of hearings that we have had on energy in America.

Frequently, President Obama in his speeches talks about America having only 2 percent of the world's proven oil reserves. Today, we are going to discuss how Canada took action to increase its proven reserves several-fold by allowing the development of oil sands in Alberta. We know that in Canada and in the U.S., there have many groups that have opposed additional oil production in both countries, but Canada faced that situation and as a result, as I have indicated, dramatically increased their proven oil reserves.

As a result of that, those of us in America, many of us, are going to continue to advocate for the Keystone XL Pipeline Expansion project that could bring an additional 700,000 barrels of oil a day to Midwestern and Gulf Coast refineries from Canada. The benefits in terms of additional secure oil and thousands of jobs is simply too important for us to give up on. I for one would like to see more Canadian oil flowing into America. I would also like to see the same type of pro-energy agenda in America that made oil sand production possible in Canada.

There is a bountiful supply of untapped oil reserves

here in the U.S., but frequently, it is too bottled up with federal access restrictions and regulatory red tape. And I believe this needs to be changed. And the development of oil sands in Canada provides many lessons for us here in America.

In spite of regulatory obstacles to additional development and production in the U.S., we do see signs of the can-do spirit in America. For example, new drilling techniques pioneered in the U.S. have turned North Dakota into a major oil-producing State. But that was possible only because it was developed on private lands, not federal lands. In the vast areas of America where we have public lands and oil in these areas, the Obama Administration has been reluctant to give the go-ahead for additional exploration and production in those areas.

I am sure the Canadian people care about the environment every bit as much as we do in America, and they have insisted all along that oil sands production be done in an environmentally safe way. We will learn today about the successful efforts to reduce environmental impacts from oil sand even as the production of oil sands increases through technology. The difference is that Canadian regulators seek to make energy production safe while the Obama Administration regulators often seek to make it impossible to do. That is why Canada's oil sands is nearly as valuable as an example of

energy policy done right as it is for the oil itself. America can and must increase its domestic energy production and there is much that we can learn from the Canadian experience. And I look forward to the testimony of all of our witnesses today on that very subject matter.

At this time I would like to recognize the gentlelady from Florida, Ms. Castor, for a 5-minute opening statement.

[The prepared statement of Mr. Whitfield follows:]

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Ms. {Castor.} Well, thank you, Mr. Chairman. And thank you to the witnesses who are here today.

Today, we are having a hearing on tar sands and we are going to hear testimony about how the production and use of tar sands fuel exacts a very heavy toll on the environment and on communities, whether it is impacts to water quality or strip mining or the very serious carbon pollution. This is dirty stuff. Do we have the technology to address these issues? It is not clear at this point that we should be going gangbusters, full speed ahead, until we really can address the economic and environmental impacts of tar sands.

As one of our witnesses will testify today, from the production well to the wheels of a car, tar sands fuel is estimated to generate about 23 percent greater carbon pollution than conventional oil. These are very serious issues and we need to get ahead of them and not stick our heads in the sand so to speak and play ostrich with this. This could be very beneficial for our energy production strategy, but it can't come at such a high cost that communities suffer, the environment suffers, that we pollute our water, we pollute our air.

One of the worst impacts could be to the climate. And colleagues, we have a responsibility to understand the

impacts to the world's climate because climate change does threaten our public health, it threatens our economic security, it threatens our agricultural production and our national security. Those are just some of the threats posed by climate change. And in some ways, this hearing is a first step. We are finally hearing about how much carbon-intensive tar sands fuel is and we are hearing about some of the technologies that could be used to reduce that carbon pollution if we are really serious, if the United States and Canada are really serious about reducing those impacts.

There are other very serious issues. I know process isn't all that exciting, but we need to be mindful that we have very important pipeline systems all across this country and throughout Canada and they work well, but what is the difference here? They have been subjected to appropriate environmental review and they have been subjected to certain safety standards. And I am afraid the majority party's push to override those considerations will eventually come at the detriment of our communities throughout both countries. So we have a responsibility to follow the law and not override these important environmental laws and community safety laws that every other business has been subjected to.

I am also at a loss frankly that throughout the entire 112th Congress, the majority of this committee has made no

effort to consider a comprehensive energy strategy, one that puts everything on the table, one that seriously examines the proper places to invest for a truly diversified energy supply. Until we do that, these issues will continue to be debated pipeline by pipeline and coal plant by coal plant and that really doesn't make sense. It is past time for this committee to examine these issues with the seriousness they deserve.

I yield back.

[The prepared statement of Ms. Castor follows:]

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Mr. {Whitfield.} At this time I recognize the gentleman from Illinois, Mr. Shimkus, for 5 minutes.

Mr. {Shimkus.} Thank you, Mr. Chairman. Thanks for calling the hearing. It is good to continue to talk about energy security and lower-priced crude oil, lower-priced gasoline, decrease in our reliance from Iran, decrease in our reliance from the Strait of Hormuz, countries that dislike us and looking north to our friends and allies, the Canadians, who I would make a point that there are no better environmental stewards than any country on Earth.

And so let me start by--I have got a couple slides based upon my trip. First, I am going to put up the pipeline issue that I addressed at a hearing before. Look at all of the pipelines we have in this country today. Why do we have pipelines in this country? Because it is the safest, most secure way to transport liquid product, whether that is crude oil, refined product. If you have ever been to a refinery, you don't see trucks going in and out because pipeline is bringing the crude, pipelines send out the broken up component parts of the refined product.

In the last hearing we talked about the numerous pipelines we already have across the Canadian-U.S. border also on the Mexican border. Next slide.

[Slide.]

Caterpillar, a great U.S. company, one of our largest exporters, relies on Canadian oil sands mining for building these great pieces of manufactured--we talk about manufacturing in this country. That is manufacturing. Our Michelin tires made in South Carolina, we are proud from Illinois, and I am proud of Caterpillar and their ability to work in this operation. Next slide.

[Slide.]

Ford trucks, Ford 150 trucks all over Fort McMurray, that is at one of the oil sands mining operations, a good American-made, probably built by United Autoworkers. It is great to see up there. Next slide.

[Slide.]

Traffic jams, if you have been to Fort McMurray, it is a little podunk town--well, it was a little podunk town. Now, you have traffic jams. And if you look to the left, those are two Harley-Davidson motorcycles, nice to see American-made products up in Canada. Next slide.

[Slide.]

That is a mining operation, and this is a good point. I want to put this up because what we are going to hear today is about a different type of oil sands recovery that creates a carbon footprint less than the California standards. This

is what you will hear debated. You won't hear anybody talk about what we are going to hear testimony about. Next slide.

[Slide.]

Another mining operation. I am from mining country in Illinois. I love surface mining; I love subterranean mining, good jobs, good salaries, good health benefits. And I think that is the last slide. I wanted to have an in situ slide but I think for most people it would be very disappointing. And hopefully we can get a slide up later on in the questioning because if you see in situ operation, what are you going to see? You are going to see a platform, maybe the sides, a coverage area, maybe three football size long. You are going to see a couple buildings and you are going to see pipes. That is all you are going to see. You are not going to see a big footprint. And you are going to see geothermal applications that create a smaller carbon footprint.

And I am not a big carbon guy, okay? If you follow my public testimony and my comments, this climate change thing, pricing carbon, I am not in that camp. But if you go in that direction, 80 percent of this oil sands recovery can be in situ, and that is what I hope my colleagues on the other side learn about today. Two different types of recovering oil sands, mining operations, in situ. Eighty percent of the oil up there now is in situ and it is in pipelines and there is

no footprint.

So Mr. Chairman, great to have the hearing today. American jobs, Canadian jobs, third-largest oil reserves on the planet. To our neighbors and friends, the Canadians, a democratic country, if you look at the top 10 how many are free capitalist societies, free market ability to grab crude oil, the oil sands is one area. We need to work with our allies and friends the Canadians to recover that. It will decrease our reliance on imported crude oil and lower our prices.

Thank you. And I yield back my time.

[The prepared statement of Mr. Shimkus follows:]

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Mr. {Whitfield.} Thank you, Mr. Shimkus.

At this time, I recognize the gentleman from California, Mr. Waxman, for 5 minutes.

Mr. {Waxman.} Thank you, Mr. Chairman.

Today's hearing will examine the production of fuel from tar sands, the technologies used in that process, and the environmental impacts of tar sands development. The Republicans and the oil industry will use this opportunity to call for building the Keystone XL tar sands pipeline and developing deposits of tar sands and oil shale in the United States. They will base these recommendations on two central claims. First, they will say that we can reduce gasoline prices by expanding production, including developing unconventional deposits such as tar sands and oil shale in the United States. And second, they will suggest that the environmental effects of developing tar sands are not that bad and getting better. My response is, don't believe them.

Let us consider gas prices. It is a Republican article of faith that we can drill our way to lower prices at the pump, but as we heard at the recent hearing on gas prices, if we increase production, it is easy for OPEC countries to reduce production by the same amount. That is the definition of a cartel--a group of entities that coordinates to control

prices. The fact is we are drilling more and prices are still going up. U.S. crude oil production is the highest it has been in 8 years, and the U.S. has more oil and gas drilling rigs operating right now than the rest of the world combined. Net oil imports as a share of our total consumption declined from 57 percent in 2008 to 45 percent in 2011, the lowest level since 1995, but prices are still going up.

In fact, Canada is the poster child for the point that more production will not free us from world oil prices. Canada has a huge tar sands deposit and is developing them at a breakneck pace. Canada is a net exporter. That means they produce more oil than they use. And I want to put up a chart that shows what has happened since 2000. Canada production and the net exports have increased steadily for the past 12 years. Canada has increased its crude oil production by more than 35 percent. Canada is producing so much oil that it now exports 70 percent of all the oil they produce. If everything the Republicans have been telling us is true, then gasoline prices in Canada should have plummeted over the last 10 years. But that is not what happened.

Here is another chart I would like to have up. And this shows the U.S. and Canadian gas prices over that period. As you can see, U.S. and Canadian gasoline prices tracked

perfectly because they are both drive by the same thing--world oil prices. In fact, Canada's gas prices are actually higher than our prices due to taxes. More drilling, building a new tar sands pipeline or developing oil shale has not reduced gasoline prices in Canada and it won't in the United States either.

But that is not the only fantasy we will hear about today. We will also hear that the environmental harms from tar sands production have been minimized and will be solved by technology. In reality, the tar sands operations have vast and devastating effects on the land, water, air, and ecosystem. Canadian tar sands are produced in Alberta's boreal forest. And the photo I would like to have put up you can see a pristine area before tar sands production begins. The landscape is beautiful. The air and water are clean. In the second photo of which we can put up you can see the effects of tar sands production. The land has been turned into an industrial wasteland. The forests have become an open pit mine. Maybe some of this damage can be avoided, technology can reduce environmental impacts, but that won't happen without stronger government regulation.

I recognize that tar sands holds a large amount of oil, but it is a resource that should not be exploited without environmental safeguards that protect that land, water, and

pollution, controls that stop the growing emissions of carbon and other dangerous gases. Until these problems are addressed, the oil in the tar sands is best left underground.

Thank you, Mr. Chairman.

[The prepared statement of Mr. Waxman follows:]

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Mr. {Whitfield.} The gentleman's time is expired.

At this time, I would like to introduce the witnesses testifying this morning. We appreciate all of you being here. We look forward to your expertise and we anticipate we will learn a lot from your testimony.

First, we have with us Dr. Eddy Isaacs, CEO, Alberta Innovates-Energy and Environment Solutions. We have Mr. Anton Dammer, Former Director, Naval Oil Shale Reserve, U.S. Department of Energy. We have Dr. John Nenniger, who is President and CEO of N-Solv Corporation. We have Mr. William McCaffrey, President and CEO of MEG Energy Company. We have Mr. Murray D. Smith, who is President of Murray Smith and Associates. We have Mr. Simon Dyer, who is the Policy Director for The Pembina Institute. And then we have Ms. Melina Laboucan-Massimo--I should pat myself on the back--for Climate & Energy Campaigner, Greenpeace Canada.

So welcome to all of you. I am going to call on each one of you to give a 5-minute opening statement. And on the front of the desk there there is a little instrument that will have different colors on it. It will have green, yellow, and red, and when it gets to red, that means your time is up. So if you wouldn't mind looking at that periodically. But each of you will be given 5 minutes. And

Dr. Isaacs, we will begin with you. So you are recognized for a 5-minute opening statement.

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^STATEMENTS OF EDDY ISAACS, CEO, ALBERTA INNOVATES-ENERGY AND ENVIRONMENT SOLUTIONS; ANTON DAMMER, FORMER DIRECTOR, NAVAL OIL SHALE RESERVE, U.S. DEPARTMENT OF ENERGY; JOHN NENNIGER, PRESIDENT AND CEO, N-SOLV CORPORATION; WILLIAM MCCAFFREY, PRESIDENT AND CEO, MEG ENERGY CORPORATION; MURRAY SMITH, FORMER MINISTER OF ENERGY, PROVINCE OF ALBERTA; SIMON DYER, POLICY DIRECTOR, THE PEMBINA INSTITUTE; AND MELINA LABOUCAN-MASSIMO, CLIMATE & ENERGY CAMPAIGNER, GREENPEACE CANADA

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^STATEMENT OF EDDY ISAACS

} Mr. {Isaacs.} Thank you very much, Mr. Chairman. And thank you for the opportunity to address you. I hope that I can add value to the work of this Committee.

I have submitted a short briefing to the Committee on what I wanted to address so I will keep my remarks fairly brief. I want to introduce my organization, I want to speak to oil sands technology and the importance of innovation and collaboration, and finally, how this all ties to energy security.

First, my organization, Alberta Innovates-Energy and Environment Solutions, we are one of four new provincial corporations launched by the Alberta Government in January

2010. We serve as the technology arm of the Alberta Government in Energy and Environment. We are a successor to two previous organizations stretching over 37 years. These organizations have been instrumental in creating the climate for commercial development of the oil sands.

We invest or fund research and technology with industry, other governments, and international collaborators. U.S. organizations are major collaborators not only in oil sands but also in cleaner coal development, in carbon capture, and renewable energy.

I want to switch now to talk about oil sands technology and the importance of innovation. Heavy oil and bitumen are found in many places worldwide. Alberta has the largest global reserves of these hydrocarbons that are not under the control of the state. Technology has been critical to the development of the oil sands resources. Many of the technologies we use today originated by companies operating on both sides of our border. The message for extraction--I think it has been mentioned--are generally mining and in situ. For in situ, we use in situ for the deeper deposits.

The major innovation in mining has been the development in the past 10 years of hydro-transport. Instead of using a truck and shovel, the ore is transported by a pipeline from the mine face as a slurry with water. The oil separates in

transit to the plant. This method is operated at lower temperature than conventional extraction, thus reducing energy intensity and greenhouse gases. With in situ methods, our steam-based processes, cyclic steam stimulation, similar technology to what has been pioneered in California in the 1960s; steam-assisted gravity drainage, which has been only in commercial operation for the past 10 years.

New technologies are emerging that are poised to significantly reduce energy intensity, reduce water use and greenhouse gases. These include steam-solvent hybrid processes that are being applied at least by one company commercially today. Use of solvents without steam, you will be hearing about that from Dr. Nenniger and N-Solv is a good example of this type of technology. Electric heating and electromagnetic heating technology is coming into use. Electromagnetic uses radio frequency to heat the oil in the oil sands. These are early days for the electromagnetic heating technology which really does bring the knowhow of the Harris Corporation in radio communication technology with the reservoir expertise of oil sands producers and is a great example of cross-border collaborative effort on a new, innovative, next-generation technology.

I also want to mention carbon capture and storage and the several billion dollar investments that are being made in

four commercial-sized demonstration projects in Alberta. In addition to new, transformative technologies there is a critical need to focus on emerging innovations to decrease the impact of current technologies on the environment, a good example of the technology deployment action plan for an end-to-end solution for oil sand dealings. This project has brought together all of the oil sands mining companies, the federal and provincial government, as well as the key engineering technology providers working in the area. Not only are there 100 technologies being evaluate to chart promising pathways, but there is a complete and open knowledge-sharing of pilots and demonstrations that have taken place and practices that have taken place for the past 20 years.

We have had a great deal of success in Alberta from a strong government-industry partnership based on clear business case and well articulated implementation strategies. This is all the formula for success, especially on the environmental front.

In the resource sector, it takes 20 to 30 years to bring new technology to market, much longer than in other sectors, and this increases the risk profile and the financial commitments required. The role of my organization is to work with industry to significantly reduce the time lag for

innovation and the risk of adapting new technology, especially next-generation technology.

And the final point I want to make is about energy security. Canada and the U.S. are the only developed countries that can dramatically increase oil production. The chairman alluded to the fact that not only do we have oil from oil sands but also increasingly from shale oil reservoirs, the Bakken type found in North Dakota, Montana, Texas, California, and the Canadian provinces of Manitoba, Saskatchewan, and Alberta. Societal expectations are that in considering economic development, we do what is best for the environment. If we are to be successful on the environmental front, then technology will be the key. To put it in the form of a simple equation, energy security equals energy, economy, environment, and societal values. In all of these, technology innovation is the glue and government's role is to create the conditions that ensure that energy is available, accessible, acceptable and affordable, or in other words, secure.

Thank you.

[The prepared statement of Mr. Isaacs follows:]

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Mr. {Whitfield.} Mr. Dammer, you are recognized for 5 minutes.

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^STATEMENT OF ANTON DAMMER

} Mr. {Dammer.} Thank you, Mr. Chairman and members of the Committee. It is a great pleasure and honor to me to share the podium today with Murray Smith from Canada. I think I am the only U.S. citizen on the Committee today. Murray was a leader in the orderly and progressive development of the Canadian oil sands.

Development has enabled Canada to be energy-independent, the goal that has eluded our country since the 1960s. Today, Canada is our largest source of imported oil. Canada--Alberta--has increased their proved reserves of oil to 176 billion barrels, second only in size to Saudi Arabia. In comparison, the United States has approximately 22 billion barrels of proved reserves. We can learn from the development of the Alberta oil sands development.

The first and perhaps the most important lesson might be to create a permanent program and decision-making process that promotes research, technology development, regulatory and statutory reform, and public education. Oil sands and oil shale share some distinct physical and developmental characteristics as both resources are unconventional and both resources are well defined, airily consolidated, and highly

concentrated.

We also share a common beginning. Following the Arab Oil Embargo, there was a resurgence in interest and purpose in energy independence in both Canada and the U.S. in 1974. In 1974, the DUI prototype Oil Shale Leasing Program awarded two leases in Colorado and two in Utah, attracting $681 million in bonus payment. It seemed that as soon as development gained momentum, it came to an end in 1982 with the precipitous drop in oil prices and the realization that prices would not escalate as originally speculated. Exxon's Colony Project abruptly closed doors without warning, an event that is popularly referred to as Black Sunday.

Not until 25 years later, the passage of EPAct '05 did the U.S. Government demonstrate any appreciable interest in U.S. oil shale resource. In the Energy Policy Act of 2005, the President and the Congress of the United States declared that unconventional fuels, including oil shale ``are strategically important resources that should be developed to reduce the growing dependence of the United States on politically and economically unstable sources of foreign oil.''

Section 369(h) of that Act directed the Secretary of Energy, in cooperation with the Secretaries of the Interior and Defense to establish a taskforce to develop a plan to

accelerate the commercial development of strategic unconventional fuels and initiate partnerships with Alberta and nations with oil shale resources. The taskforce report with recommendations was completed and forwarded to the President in February of 2007. Unlike the Alberta experience, the report was never implemented, no plan, no policy, no progress.

We are grateful for a strong and reliable trading partner to our north, but we are still dependent on the import of close to half of our daily oil requirements. We still consume roughly a quarter of the world's oil supply and we remain reliant on an increasingly competitive, unstable, and often hostile world oil market for our energy security.

The United States is the custodian of the largest and most concentrated hydrocarbon resource on earth, oil shale. Conservatively estimated to exceed two trillion barrels, it has the potential to provide millions of barrels of production per day if developed in a planned and prudent manner analogous to the Alberta experience. In the Green River Basin of Colorado alone, the USGS estimates that 800 million barrels could be produced, over three times the total reserves of Saudi Arabia.

In spite of lack of national direction in oil shale development, there remains considerable activity in the

private sector. The activities of 32 companies are summarized in the report Secure Fuels from Domestic Resources, which is found on the web.

Great progress has been made in limiting water utilization, increasing energy return on investment, and minimizing the environmental impacts historically associated with oil shale development. As history as proved, the only limitation to developing oil shale resource in the United States has been, firstly, economic; and secondly, access to the resource, 80 percent of which is on federal land. As oil prices range above $100 per barrel, the economics look increasingly attractive and the technical evolution of both surface and in situ technologies are encouraging.

The oil shale moratorium established under the Hoover Administration in 1930 remains in effect. Today, a handful of oil shale R&D leases have been parsed out by the Department of Interior. Another programmatic environmental impact statement has been published and is now in comment, a weak, disjointed, and affected process, unable to provide industry the surety of commitment on the part of the government to risk investment of billions. We need to plan for the development of this prolific U.S. resource as the Canadians plan for the successful development of the Athabasca oil sands. We have the mechanism through Section

369 of EPAct '05. Ironically, failure to perform the requisite planning and preparedness will inevitably lead us back to everyone's deepest fear--Black Sunday.

Mr. Chairman and members of the committee, I thank you once again, and I look forward to working with you in any capacity in furtherance of national security and preparedness.

[The prepared statement of Mr. Dammer follows:]

********** INSERT 2 **********

Mr. {Whitfield.} Thank you.

Dr. Nenniger, you are recognized for 5 minutes.

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^STATEMENT OF JOHN NENNIGER

} Mr. {Nenniger.} Thank you. Good morning, Chairman Whitfield, Ranking Member Rush I guess is not here and members of the Committee. I am John Nenniger, CEO of a technology company called N-Solv. I am a Canadian who has had the great privilege of earning a doctorate in chemical engineering from MIT. My energetic and remarkably patient wife is an American citizen, born and raised in Kentucky, who also has a doctorate in chemical engineering.

It is a great honor for me to be here today to discuss solvent-based oil sands extraction. Inexpensive energy is good for the American economy but the evidence of climate change is both compelling and terrifying. This is a profound moral dilemma. I believe that harm reduction is the most pragmatic option. On the oil sands, this means finding profitable ways to produce cleaner oil.

The N-Solv extraction process is an underground extraction process similar to steam except condensing solvent provides the heat. The N-Solv process produces a more valuable product for a lower cost because it is energy efficient and it does not use water. Although our laboratory results are very encouraging, N-Solv has not yet been tested

in a reservoir. In comparison to steam, N-Solv is expected to reduce energy consumption by 85 percent, reduce well-to-tank greenhouse gases by 205 pounds per barrel, increase oil value by 23 percent, reduce capital and operating expenses by 30 percent, double the net back per barrel, triple the payout. Our field pilot is expected to produce first oil in April of 2013.

As a scientist, I view extravagant claims with great skepticism unless they can be supported with compelling evidence. I don't have time to present our evidence today but there is more detail in the written handout and on our website. We found that bitumen dissolution into solvent proceeds in a way that was quite different than what everybody had thought. Our observations have been independently confirmed by researchers at a number of different universities. Although there has been decades of experimental work on solvent, our results show that the previous interpretation of lab experiments was incorrect, and consequently, the reservoir predictions were also incorrect.

We developed a sophisticated apparatus and ran a series of experiments to measure chamber growth rates. Our experiments showed we could achieve oil rates at 100 degrees Fahrenheit that were three times faster than steam at 450 Fahrenheit. To make sense of our results, we assembled a

database of every solvent experiment in the scientific literature. We were able to successfully correlate the literature data over a huge range of conditions and our lab results are exactly in line with the independent data from the literature. This gives us great confidence that our spectacular results are real and credible.

It is the early days for N-Solv, so discussion of its economics are speculative. The commercial advantage comes from producing a more valuable oil at a lower cost. The oil is more valuable because it is de-asphalted. On the process capital cost is cut in half because there is no boiler feed, water treatment, and no steam generation.

The net back for N-Solv of $52 per barrel is expected to be almost twice as high as SAGD. The payout ratio, $6 of net back per dollar of investment is three times higher than SAGD. Remarkably, we think these numbers are understated. The ability to operate modest temperature and pressure will help us access standard bitumen resource that is currently uneconomic, including the carbonates which contain over 1,000 billion barrels.

Now, I am going to talk about the environmental benefits. N-Solv does not use any water. That is a big deal. N-Solv reduces the energy consumption by 85 percent because the extraction takes place at 100 Fahrenheit instead

of 450. The 85 percent reduction doesn't capture the entire story because the oil quality makes it easier to upgrade and refine. We are building a $60 million field pilot to test the N-Solv technology in a reservoir setting. Suncor Energy has offered to host the pilot, including building the wells. Hatch has made major capital investments and is providing the engineering. We have received financial support from Sustainable Development Technology Canada. I can't say enough good things about SDTC. Enbridge Pipelines has also contributed significant capital towards the pilot.

The final item I want to talk about is safety. Safety is always at the top of our minds. The science tells us that we can achieve commercial extraction rates at modest temperatures and pressures. Over-pressuring the reservoir is both unnecessary and economically undesirable. If a high temperature is needed at a lower pressure, the operator can always change to a more appropriate solvent.

In summary, N-Solv produces a more valuable product at a lower cost because it is energy efficient and does not use water. I look forward to your questions and comments. Thank you.

[The prepared statement of Mr. Nenniger follows:]

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Mr. {Whitfield.} Thank you very much.

And Mr. McCaffrey, you are recognized for a 5-minute opening statement.

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^STATEMENT OF WILLIAM MCCAFFREY

} Mr. {McCaffrey.} Mr. Chairman, Congressmen, thank you very much for the opportunity to speak today about technology and the energy industry in Canada.

I am Bill McCaffrey; I am the president and CEO of MEG Energy, and today I am here representing In situ Oil Sands Alliance. And this is a group of independent Canadian companies dedicated to the responsible development of the Canadian oil sands using in situ technology. The main in situ technology used today is steam-assisted gravity drainage, or SAGD, as it is called. And SAGD is important because it is currently the most common commercially proven--pretty much the only commercially proven way to reach the deep reservoirs that contained 80 percent of Canada's total oil sands reserves. And just to put that into perspective, that represents about 140 billion barrels of reserves, roughly equivalent to the entire reserves of Iran.

Now SAGD technology is pretty simply, really. It uses horizontal wells drilled from surface and we drill down to about 1,000 feet below the Earth's surface. Once we reach the reservoir and complete the wells, we drill about half a mile out, inject steam into the reservoir, and bring the

heated oil and the water back to surface without disturbing the forest floor. And from a well pad a fraction the size of this building, the subsurface equivalent of 95 NFL football fields can be accessed. This provides what is among the lowest ratios of surface disturbance to resource recovery in the oil and gas industries anywhere in the world. About 90 percent of the water that is used to create the steam is recycled with the portion we can't recycle returned to deep, non-potable reservoirs. There are no tailing ponds created and it is essentially a closed-loop system.

In going forward, one of the key research and development focuses is to reduce the amount of energy we need to produce a barrel of oil. That is critical because of both the emissions and costs associated with the energy consumption. One of the technologies we are currently applying alongside of the SAGD is cogeneration, a very energy-efficient process that produces both steam for our operations and electricity for the sale to the grid. And that electricity has a carbon footprint less than half the Alberta grid average, reducing greenhouse gas intensities in the province.

And in 2011, just as an example, MEG's cogeneration contribution alone was equivalent to taking 80,000 cars off the road. That kind of benefit is continuing to grow as co-

gen replaces legacy plants that have reached the end of their useful life. In our case, when we factor in the benefits of cogeneration and efficient steam use, SAGD can produce a barrel with the wells-to-wheels carbon footprint about 6 percent below the average U.S. imports.

And as we look to the future, the industries investing in many other innovative technologies, nearly all of which share the same common goal--and you will hear that today--is to improve energy efficiency, it is to drive down emissions, and it is to increase resource recovery rates. And I underline one point. SAGD is just 10 years old. It is a young technology. It has been in commercial operations for about 10 years. But the point out of it is there remains tremendous opportunity for innovation to further accelerate the strides that have already been made.

Looking beyond resource recovery, we are also working with Canadian and U.S. research groups on technology to customize our export barrels. The goal is to better align these barrels with the configurations of U.S. refineries offering significant improvements in refinery efficiencies and economics and the jobs that come with them. These technologies can also support more efficient lifecycle fuel use. For example, barrels can be tailored to be an ideal feedstock in the creation of ultralow sulfur diesel, a

friendlier fuel option that many U.S. automakers are now targeting.

Government can have a role in partnering with industry to encourage technology acceleration, a topic I know several of the other panelists are talking about here. But I would also note that the government also has a necessary and a critical role as a regulator. While still maintaining the highest standards, we need to streamline the regulatory processes so that windows of opportunity to invest and innovate are not missed.

And to conclude, innovation, collaboration, and regulatory efficiencies are all critical to our economy today and into the future. With the oil sands industry alone, the prize for the United States is an increase in goods and services output projected to reach $45 billion a year by 2035 and the creation of nearly half a million American jobs in that same time period.

And finally, I would just argue that it is of our mutual interest in terms of economic stability, environmental responsibility, and energy security to work together. The focus of this committee on harnessing technology to realize these goals to me is entirely appropriate. And I thank you for the time today.

[The prepared statement of Mr. McCaffrey follows:]

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Mr. {Whitfield.} Thank you.

Mr. Smith, you are now recognized for 5 minutes.

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^STATEMENT OF MURRAY SMITH

} Mr. {Smith.} Well, thank you, Chairman Whitfield and members of the Committee. And as Canadians, let me thank you for holding this hearing in March and not in July or August. It has been my privilege to serve Albertans as minister of energy, elected position from 2001 to 2004. During that time, I was able to quantify and register the 176 billion barrels of oil sands resource, proven oil sands resource with the U.S. Energy Information Agency. This move catapulted Canada's total proven oil reserves from less than 1.4 percent of the world's supply to over 15 percent, and we believe, as you have heard, that there are many more barrels to come and only technology will unlock this resource.

How did Alberta move from this? We started from scratch, 1967, with a joint government-private sector consortium, and today's production levels of over 1.7 million barrels today is a compelling story of human will, initiative, and technology evolution. And it would not have been possible without significant contributions from U.S.-based companies. Now, Alberta owns these resources and manages them on behalf of the citizens of Alberta. And today, some scant 50 years later, the oil sands is the

largest investible resource in the world today where private dollars can flow in from private companies into a jurisdiction that respects property rights and ownerships.

Oil sands projects are carefully regulated on multiple levels and learning and improving operations all the time. Mined permits, facilities, must go through extensive review before approval is granted, and after approval, construction and fabrication is carefully monitored with annual plans in development submitted for mandatory approval. As the projects begin to produce, there is again extensive oversight. There are no reports of oil spills from oil sands reserves.

As oil is produced and shipped, there are in place numerous monitoring programs, and today this oil is shipped primarily to the USA. And a recent EIA report in February showed that retail gas prices in areas where oil sands oil is delivered to other regions of the USA, the difference in price is as much as 50 cents per gallon where there has been reports of Alberta oil in that region. And that is in the EIA report.

Throughout this period, technology innovation and continuous improvement have been Keystone's and oil sands development. Government policy including land sales, royalty, and tax assistance, and in some cases actual funding

and partnership with industry have created a wealth-creating job-generating engine over many years. In 1993, the oil sands have moved primarily from the production of two operators and production was 300,000 barrels a day. Government of Alberta royalty revenues have been suffering from low commodity prices. We had a government that had a deficit that exceeded revenue by some 25 percent, debt levels were approaching 28 billion. We are 100th the size of this country. Oil sands investors asked for a level playing field, a generic royalty structure, and an accelerated tax recognition of their investments. They received no direct benefits unless they invested their money first. A tax on machinery and equipment was phased out, royalty structures became based on a payout period, royalties started low, and as projects paid out, increased to 25 percent of net profit.

Today, Mr. Chairman, oil sands royalties exceed those collected from all our natural gas production and the problems in Alberta. So with this structure and investment, billions of dollars poured in. We increased production to 600,000 barrels per day by the time I got elected in 1993. In 2003, the world became aware of this resource and it created a stampede of investment. It created technological innovation that basically has coined the oil sands as the world's engineering sandbox.

Let me just give you one example. Williams is an active, respected, midstream gas USA company. They have developed and deployed a technology that we use as surplus gases emitted from the coking process that upgrades bitumen to a transferable form. Now, as the gases are emitted from the coking process, Williams traps these gases. They then remove the propane, butane, and higher C5 gases for use in sale later in the gas stream. They return dry, clean-burning gas back to the coker. This elegant but simple process now removes over 300,000 tons of CO_2 from the atmosphere each and every year. They have the potential to put four or more plants in that area resulting in over some million tons per year in reductions.

So as a former politician, Mr. Chairman, let me just outline the changes. We balanced our budget in 1995 after implementing the Oil Sands Royalty Program. All of our provincial debt was paid off in 2004. We had never increased taxes. We in fact refunded cash to the citizens of Alberta. We have doubled the Medical Research Fund. We have doubled the Alberta Ingenuity Fund, and we have created a sustainability and capital plan that allowed us to go through the difficult times of the last 3 years. And then in 2004, the book showed a stunning $68 billion turnaround from the dismal economic situation of 1993.

Let me finish, Mr. Chairman, with two quick stories. 2005, 60 Minutes aired a special on the oil sands. A 22-year-old trucker said he made $120,000 that year. The end of the program the CBS phone line system was so deluged with calls it crashed. Over 1,500 Americans ranging from truck drivers to nuclear engineers phoned in. What did they want? Jobs.

So let me finish with a quote from our great neighbor to the south, Governor Schweitzer, Brian Schweitzer, who realizes that production from Alberta will be secure, reliable, non-geopolitical, reasonably priced energy. And he says, ``I do not believe that we will ever have to send the National Guard to Alberta to protect our oil supply.'' Now Alberta is the number one energy supplier to the USA and the dialogue and the insight that your wisdom has shown in calling this committee meeting, Mr. Chairman, that will be gained today is critical to maintaining that special relationship. Thank you for this opportunity to serve the House of Representatives.

[The prepared statement of Mr. Smith follows:]

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Mr. {Whitfield.} Thank you.

Mr. Dyer, you are recognized for 5 minutes.

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^STATEMENT OF SIMON DYER

} Mr. {Dyer.} Good morning, Mr. Chairman and committee. My name is Simon Dyer. I am the policy director with the Pembina Institute based in Alberta, Canada. The Pembina Institute is Canada's nonprofit sustainable energy think tank. We focus on energy solutions through research, education, consulting, and advocacy. We have a long history as the leading independent expert on oil sands environmental policy and performance. We have participated in the regulatory process in Alberta for 20 years and we conducted extensive research on policy solutions to current environmental problems in the oil sands.

The biggest impediment to progress on reducing the environmental impact of oil sands through the deployment of new technologies is the lack of regulatory policy to drive improved performance. All the major environmental accomplishments such as dealing with acid rain, the hole in the ozone layer, and removing lead from gasoline were all driven by regulatory approaches that resulted in increased environmental performance and technological innovation in the industry. In the oil sands, however, little attention has been focused on the appropriate role of government in

regulating environmental performance, and thus, many of the environmental impacts continue to worsen today.

My comments, due to the short time, will be focused on greenhouse gas pollution but the same principles apply to other unresolved environmental impacts such as tailings waste management, fresh water use, air pollution, and land and wildlife impacts. Over the last two decades, oil sands greenhouse gas emissions have more than doubled. In 2009, oil sands operations in Canada emitted 45 megatons of greenhouse gases. According to recent projections by the Government of Canada, this is set to double again by 2020.

What is less well known is that oil sands greenhouse gas emission intensity--that is how much carbon dioxide per barrel produced--has actually worsened over the past 6 years. This has undone some of the improvements in the emissions intensity that other presenters have mentioned. Improvements since 1990 were largely driven by one-time changes like switching fuel from coke to natural gas and by incorporating cogeneration into projects. The insinuation that these kind of improvements will continue into the future is not supported by the evidence.

The worsening emission profile of the oil sands can be attributed to three main issues. Firstly, an increasing proportion of oil sands production will be coming from in

situ oil sands development, as noted by other speakers here today. In situ development produces two-and-a-half times more greenhouse gas emissions per barrel than oil sands mining does. Secondly, as oil sands development increases, companies are exploring lower-quality and harder-to-access bitumen resources and developing these resources means increased environmental impacts per barrel. Thirdly, the very weak regulatory environment of the greenhouse gas management in Alberta and Canada does not require substantial improvements in greenhouse gas emissions.

As you may know, the Government of Canada has repeatedly failed to meet its own targets to reduce greenhouse gas pollution, and the oil sands are the major reason behind this. While most industries in Canada are holding steady, emissions in the oil sands continue to rise. A 2010 MIT study quantified this effect with economic models and concluded that the niche for the oil sands industry seems fairly narrow and mostly involves hoping the climate policies will fail. In Canada, hitting climate targets while the oil sands expand dramatically would mean asking every other sector in our economy to do more than their fair share, a prospect that is so unappealing that every Canadian environment minister to date has opted to miss their targets instead.

Much attention has been paid to the potential role of carbon capture and storage, or CCS, in limiting greenhouse emissions from the oil sands. Indeed, Alberta's climate plan says CCS alone will account for 70 percent of Alberta's reductions by 2050. However, there are no operating CCS projects in the oil sands. One planned integrated project, Shell's Quest Project, proposes to capture 1.2 million tons of emissions from the Scotford Upgrader. This project will receive $865 million in subsidies from the Alberta and federal governments.

While in principle, CCS could be applied at different stages of the oil sands, it is not economic under current policies. Carbon capture costs for oil sands projects range from 75 to $230 per ton of carbon dioxide. In Alberta, the effective carbon price is only $15 per ton of CO_2. At this price level in the absence of further massive public subsidies, there will be no deployment of CCS in the oil sands beyond Shell's Quest Project.

Unfortunately, Alberta's climate plan states that 30 megatons of annual reductions will be derived by CCS by 2020, the equivalent of building 25 Quest-type projects in the next 8 years. Clearly, this is a fiction. For carbon capture to be economic, governments would either have to implement carbon prices an order of magnitude higher than they are

currently or mandate carbon capture and storage for the oil sands industry.

In December, Pembina Institute conducted the first assessment of Alberta's climate plan. We concluded that Alberta will miss its emissions target by two-thirds. We characterized Alberta's climate plan as ``a car without an engine,'' as many of the elements that could be effective but without a meaningful carbon price, it just won't run. The current frenzied rate of oil sands development in Canada is a symptom of our failure to implement policies and regulations to meet our commitments. Rosy projections of oil sands expansion are simply mathematically inconsistent with these commitments.

I would like to finally comment on the fact that Pembina Institute is supportive of voluntary measures in research and development by oil sands industry. It is important to distinguish between lab research and small-scale pilot projects and commercial penetration of new technologies. The commercial application of new technologies is simply not keeping pace with this expansion and the vast majority of new production will rely on conventional more polluting technology. This represents a significant opportunity lost and can only be addressed through policy and regulatory intervention.

Thank you very much. I look forward to your questions.

[The prepared statement of Mr. Dyer follows:]

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Mr. {Whitfield.} And thank you, Mr. Dyer.

And Ms. Laboucan-Massimo, you are recognized for 5 minutes.

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^STATEMENT OF MELINA LABOUCAN-MASSIMO

} Ms. {Laboucan-Massimo.} Thank you. Good morning, chair and Committee. My name is Melina Laboucan-Massimo. I come from northern Alberta, Canada. I am a member of the Lubicon Cree First Nation, which is one of the many communities impacted by tar sands development.

For those of us in Canada who are experiencing the detrimental effects of tar sands, it is encouraging to see that many decision-makers and citizens in the United States are beginning to ask questions around whether or not the tar sands are in the right direction and which we should be pursuing in an already carbon-constrained world. In the past 5 years, I have worked in communities throughout Albert and British Columbia that are very concerned about the approval of tar sands pipelines not only because of potential spills but also because it will increase pressure for more tar sands expansion in Alberta.

I personally have felt the impacts of both pipeline spills and tar sands-driven industrialization of the landscape in the north. Last spring, I returned home where I was born to witness the aftermath of one of the largest spills in Alberta's history, which was 50 percent larger than

the oil spill in the Kalamazoo River in Michigan. What I saw was a landscape forever changed where my family fished, hunted, and trapped for generations. Days before the federal or provincial government admitted that this had happened, my family was sending me messages telling me of headaches, burning eyes, nausea, and dizziness, asking me if I could find out more information as to if it was an oil spill and how big it might be. This was one of the saddest and most frustrating points because my family was not the first, nor the last, to experience these effects. It was alarming to hear that the first phase of the Keystone had already leaked and spilled 14 different times in its first 12 months of operation.

Where I come from billions of dollars are taken out of our traditional territories. Yet, until this day, my family still has no running water. The indigenous communities have lived in these regions for thousands of years and yet are being pushed out, unable to access their traditional territories and unable to practice their treaty rights due to tar sands expansion. This is a violation of our constitutionally protected rights under Section 35 of the Canadian Constitution.

Communities like Fort McKay First Nation can no longer drink the water from their taps and their children are

developing skin rashes from bathing in this contaminated water. A cancer study done by Alberta Health Services reveal that there was a 30 percent increase in the community downstream of Fort Chipewyan. Leukemias and lymphomas were increased by three-fold and bile duct cancers increased by seven-fold. Almost all of the cancer types that were elevated were linked in scientific literature to chemicals in oil or tar. We have toxic tailing ponds sitting in the north of Alberta that span over 170 square kilometers, which is equivalent to 42,000 acres.

This is the reality in Canada. And more specifically, in Alberta, we have a lax and failing environmental monitor system, which has little to no enforcement when it comes to the tar sands. There have been thousands of alleged contraventions, notifications, and releases with little to no evidence of enforcement as see in a database from Alberta Environment Documents, which details incidences of licensed and unlicensed discharges of pollutants, tailing leaks, chronic acute pollution incidents, habitat destruction, and failure by industry to maintain monitoring equipment, pollution and government documentation of reclamation and chronic lack of enforcements.

We have endured decades of promises that have taught us that promises of new technologies that will repair this

damage feel like empty words. The reality is that SAGD solutions usually move the problem elsewhere such as pumping the toxic byproduct underground where they can leak into aquifers rather than storing them in tailing ponds from the mines. Meanwhile, the scale of production is increasing and the overall programs are getting worse. We have not yet seen a cumulative environmental assessment overall in the tar sands and the government is therefore passing these projects without this cumulative environmental assessment.

Companies will leave irreparable damage to our lands and our homes, and the Alberta government claims to reclaim the land. However, many prominent scientists dispute that this is possible. Just last week, a report was published in the proceedings of the National Academy of the Sciences of the United States of America stating ``any suggestion that oil sands reclamation will put things back to the way they were is greenwashing.''

First Nations in British Columbia are also adamant that the Enbridge pipeline will not be built through their territories. Over 100 First Nations have signed on to this declaration to oppose the construction of the Enbridge pipeline and its associated supertankers on the west coast of Canada and First Nations are willing to pursue litigation if the Enbridge pipeline is approved in Canada as they have

constitutionally protected rights under Section 35 of the Canadian Constitution.

If constructed, the Keystone XL would deepen our mutual addiction to dirty oil and enable the ongoing expansion of the tar sands at the expense of communities, as well as at the expense of advancing cleaner energy alternatives. You have a choice in the direction we are taking in the world. You have the opportunity to become the world leaders in clean renewable energy solution that meet our energy needs without undermining or sacrificing the health of our communities and ecosystems.

Thank you very much.

[The prepared statement of Ms. Laboucan-Massimo follows:]

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Mr. {Whitfield.} Thank you very much. And thank all of you for your thoughtful testimony.

And at this time we will have periods of questions for the panel and I will recognize myself for 5 minutes, and then we will go to the other members.

First of all, Mr. Smith, you were the minister of energy in Canada for a number of years, is that correct?

Mr. {Smith.} That is correct. I was the minister of energy for the Province of Alberta, which owns the resource and manages it on behalf of all Albertans.

Mr. {Whitfield.} And how would you describe the government of Alberta's approach to leasing land for oil sands development?

Mr. {Smith.} What happens, Mr. Chairman, is that if there is no record of development after a lease has been purchased in an open auction type of format, then that lease reverts back to the Crown and it is in fact resold. So that way it is a clear process, it is a transparent process, and it is one that has been free from corruption for the last 70 years that it has been in place.

Mr. {Whitfield.} Well, would you characterize Alberta as being encouraging development or being an obstacle to development?

Mr. {Smith.} Well, I don't think the government that I was involved with, Mr. Chairman, made any secret out of wanting to generate employment and create jobs and create prosperity and wealth for the Province of Alberta. That province, at the time I was elected at 2.5 million now has 3.7 million people. It has consistently the lowest unemployment across Canada, consistently the highest average earnings. The oil sands itself has created more jobs for aboriginal and First Nations people in Canada than any other place in Canada today.

The oil sands fall under three areas of the government--regulator, policymaker, and royalty collector. So you are always in a dynamic tension of dealing with those three matters. They are making great progress. I have seen reclamation of mined sites, Mr. Chairman, where the company went to the elders of the First Nations, they asked what would they like in reclamation, and in fact they created a buffalo herd. That buffalo herd that is on there today has a herd of about 300 with a 99 percent successful calving rate.

Mr. {Whitfield.} So if I describe the Alberta area as having an economic boom since this took place, would that be accurate or not?

Mr. {Smith.} Absolutely.

Mr. {Whitfield.} Accurate, okay. Now, we have had a

number of hearings on Keystone pipeline, and those people who are opposed to it I think I can characterize their description of oil sands production and so forth as being inherently dirty and inherently more risky than other types of oil. Would you agree with that characterization, Mr. McCaffrey?

Mr. {McCaffrey.} No, I wouldn't actually. When we look at the greenhouse gas footprints that we have relative to other U.S. imports, I think we have made great strides on it. It doesn't mean we can't continue to do better and that is what we are doing. We are focusing that on energy efficiency, and some of the things that we are working on right now in areas of technology are very exciting. But no, I wouldn't agree with that.

Mr. {Whitfield.} Okay. Mr. Dyer in his testimony made this comment that in situ extraction had significantly more greenhouse gas intensity means it ostensibly produced more greenhouse gases than other methods of extraction and he said on average 2.5 times more intensive than mining as far as greenhouses go. Would you and Mr. Smith agree with that comment or not?

Mr. {Smith.} Actually, Mr. Chairman, Dr. Isaacs would probably be the best person to--

Mr. {Whitfield.} Would you agree with that comment, Dr.

Isaacs?

Mr. {Isaacs.} No, I wouldn't agree with that comment.

Mr. {Whitfield.} Okay. Now, Mr. Dyer also said that there is a weak regulatory system in Canada relating to production of oil sands. Would you agree with that statement, Mr. Smith?

Mr. {Smith.} No, I wouldn't, Chairman Whitfield, because Alberta recognizes that it has great and vast resource and it must be developed in an orderly manner and it must pay attention to environmental values and social values. It was the first province in Canada to have a Department of Environment. It was created solely for the purpose of managing these resources. We have a quasi-independent semi-judicial regulator that makes decisions on the development. It takes 3-1/2 to 5 years to approve one SAGD process. A mining project has been in approval over 7 years. These panels are joint panels, federal Fisheries and Oceans, federal environmentalist departments, they will share in the panels. It is a very highly regulated and public process.

Mr. {Whitfield.} Thank you. My time is expired.

At this time I recognize Ms. Castor for 5 minutes.

Ms. {Castor.} Well, thank you, Mr. Chairman. Thank you all for your testimony.

I would like to keep on that line of questioning and

understand that in Alberta you have an Energy Resources Conservation Board, Department of the Environment, Department of Sustainable Resource Development. They all maintain very robust rules for tailings management, land reclamation, water pollution, groundwater monitoring. So, because my time is limited, could you go down and just give me a yes or no answer. I think many of you have already stated this. Are those fundamental health safety and environmental regulations important? Yes or no?

Mr. {Isaacs.} Yes.

Mr. {Dammer.} Yes.

Mr. {Nenniger.} Yes.

Mr. {McCaffrey.} Yes.

Mr. {Smith.} Without question.

Mr. {Dyer.} Yes.

Ms. {Laboucan-Massimo.} Yes.

Ms. {Castor.} Well, see, the difference here in the great United States of America is that what the Republicans have tried to do is have this Keystone pipeline approved by passing a bill and giving short shrift to a lot of those health, safety, and environmental reviews, really giving them special treatment by passing a law and not adhering to things like the National Environmental Policy Act and others. And that is not fair. All of these entities should play by the

rules.

Today, we have heard several witnesses testify about the ability of new technologies that attempt to minimize the impacts of tar sands oil development on strip mining, on water pollution, the lingering toxic chemicals in these large tailing ponds, the decades of dealing with the solid wastes that is left over and carbon pollution. And it is important that here in the United States we understand the impacts of the tar sands.

Mr. Dyer, based on your study of the tar sands industry in Canada, have environmental impacts of the tar sands been significantly mitigated through the deployment of new technology?

Mr. {Dyer.} Well, I wouldn't take my word for it. I mean if you look at the Royal Society of Canada's report on the tar sands, which is the equivalent of your U.S. Academy of Sciences. They concluded that regulations haven't kept pace with oil sands development, so absolutely not. As was mentioned, there was an absolute boom in the oil sands and it left regulators unprepared to catch up with addressing cumulative environmental limits in the oil sands.

Ms. {Castor.} Thank you. And how about you, Ms. Laboucan-Massimo? Has technology fixed the environmental harms from tar sands production that are so devastating to

the First Nations communities?

Ms. {Laboucan-Massimo.} In my opinion no, unfortunately, because what we are seeing are impacts of the land. We are seeing impacts to the air and to the water. And so we have seen exceedances happen from operations that impact the communities downstream and that are around the communities. We have seen cattle ranchers actually have they think connected to the emissions have their cattle miscarriage because of things like where they are feeling quite ill from the inability for them to capture fugitive emissions. So it is impacting people and I don't feel like it is doing its job.

Ms. {Castor.} And in addition to pollution of water and water quality issues, development of tar sands is a very water-intensive process. So it impacts water quantity. In fact, it takes as much as four barrels of water to produce just one barrel of bitumen from tar sands. And here in the United States it is reported that we have rich deposits of tar sands and oil shale in arid western States such as Utah and Colorado and Wyoming.

Ms. Laboucan-Massimo, can you speak to the impacts of tar sands development in Alberta on the local water resources? Go into a little greater detail on water quantity requirements and water quality.

Ms. {Laboucan-Massimo.} Well, the area where we are, the Peace-Athabasca Delta is a sixth of Canada's fresh water supply, so we are dependent on that water supply. It is very important to us so what we have seen is that industry has used this water as well so we are somewhat at competing needs for it. But the damage that we have seen happen to the downstream communities, you know, we are seeing unfortunately fish with tumors and such because of the contamination but we are also seeing lower levels of water in the area. So I have talked to elders that, you know, used to boat down from community to community and now they are hitting sandbars because there are decreased water levels in the areas. And that is very concerning. For the scientific community where they are actually saying if there is decreased levels that will, you know, do a fish kill or a potential fish depopulation of the areas. So there is definitely downstream impacts as well as for communities around that region as well.

Ms. {Castor.} Thank you very much.

Mr. {Whitfield.} At this time, I recognize the gentleman from Illinois, Mr. Shimkus, for 5 minutes.

Mr. {Shimkus.} Thank you, Mr. Chairman. So many questions, so little time. First of all, I did meet with the chief elder of First Nation on my trip and although he was

concerned about expansion, he did appreciate the hundreds of jobs, thousands of jobs available to tribal members in these operations. I want to put that on the table.

And again, this Keystone debate is really kind of goofy because we only spent 3-1/2 years to study it. Ten thorough agencies all approved it. EPA said it was okay. So for us it just drives a lot of us crazy to hear these really fallacious false statements about the entire process.

Let me go briefly. I have got a couple pictures. Let us put the first one up. This is in response to my friend, Mr. Waxman. That is a recovered mine operation site. Now, I am from Southern Illinois. We had strip coalmining obviously in the first days, not very good environmental stewards. We recover coalmine operations now and that is a picture of before and after of a recovered, reclaimed surface mining operation.

Let us go to the next slide because it really dealt with my opening. We better start talking about the two different types of operations. For as much as the environmental left wants to keep beating us up, there are two different operations. And these three pictures show that. This is an in situ operation. Go the next picture. That is the footprint when it tails off. That is kind of the wells. Go to the next one. Of course the little pipeline and then the

product. So I just need to put that on record.

Let me ask Dr. Isaacs. I have a quick question. You mentioned some technology company, communications company. What company was that?

Mr. {Isaacs.} Harris Corporation headquartered in Florida.

Mr. {Shimkus.} Melbourne, Florida, I think, right?

Mr. {Isaacs.} Right.

Mr. {Shimkus.} So this is a big operation for them?

Mr. {Isaacs.} Yes.

Mr. {Shimkus.} Great. Mr. Dammer, I just want to thank you for talking about the 2005 energy bill. I was on the Conference Committee, great piece of legislation and I hope it helps us create additional operation in oil shale development.

Dr. Nenniger, when you are talking about your new operation, it sounds like you are putting a chemical solution down to recover the oil sands. Is that correct?

Mr. {Nenniger.} Most likely, it is either condensing propane--

Mr. {Shimkus.} Okay.

Mr. {Nenniger.} --which is what you burn in your barbecue or condensing butane.

Mr. {Shimkus.} And obviously, you have been following

our debate on fracking. And you are doing a lot of research. Would you want to immediately disclose that list of operation to anyone who wants to use that or would it be proprietary information?

Mr. {Nenniger.} No, it is absolutely open.

Mr. {Shimkus.} Good.

Mr. {Nenniger.} We have technical papers on our website. We have 10, 15 patents so--

Mr. {Shimkus.} Great, thank you. I got short time. Let me go to Mr. McCaffrey.

Mr. McCaffrey, you have listened to a lot of some of the statements. I would like for you to address two issues-- wheels-to-well carbon dioxide emission levels, and also I would you to address this water issue that was raised, especially in your expertise on in situ.

Mr. {McCaffrey.} Sure. In terms of wells-to-wheels analysis, we are focused on the energy intensity and we have been successful in continuing to reduce our greenhouse gas emissions throughout the last several years and we have a target of continuing to reduce those. It is all focused on improving our energy efficiency and using novel technologies like cogeneration and then seeing what we can do to substitute out the steam as we go along through infield wells and the use of natural gas, which is just methane in the

reservoir. We just--

Mr. {Shimkus.} And you told me that that process is actually lower than the California carbon standards, is that correct?

Mr. {McCaffrey.} Absolutely. I think it is about 15 percent.

Mr. {Shimkus.} Great. Can you now move into the water usage issue?

Mr. {McCaffrey.} Sure. It is pretty much a closed-loop system where we recycle the water back--or we bring the water back when it is produced so it is condensed steam, drains down to the producer, we bring it back, we recycle it, and we use it over and over again.

Mr. {Shimkus.} So this number of the use of water in your operation is not true?

Mr. {McCaffrey.} No. No, we recycle 90 percent.

Mr. {Shimkus.} Great. Thank you.

Mr. Chairman, I will return back 19 seconds.

Mr. {Whitfield.} At this time, I would like to recognize the gentleman from California, Mr. Waxman, for 5 minutes.

Mr. {Waxman.} Thank you, Mr. Chairman.

Since last May, this committee has held four hearings on the Keystone XL tar sands pipeline and passed two separate

bills to mandate approval of that pipeline, and yet the majority has never bothered to examine the impacts of tar sands production and transport on public health and the environment. In particular, there has been no effort to understand what a shift to tar sands fuel would mean for U.S. carbon pollution. So today's hearing is long overdue. And it appears that most of the witnesses here recognize that tar sands pose serious environmental threats that must be addressed. For example, every witness on this panel has provided testimony about efforts to reduce greenhouse gas emissions from tar sands productions. One of the witnesses invited by the majority, Dr. Nenniger, states that ``the evidence of climate change is compelling and terrifying.'' Another, Dr. Isaacs, states that ``careful management of environmental issues, especially greenhouse gas emissions, is essential.''

Mr. Dyer, are the tar sands operations really getting cleaner in terms of carbon pollution, and if not, why not?

Mr. {Dyer.} In absolute terms, definitely not as we demonstrated here looking at the emissions doubling by 2020. And in terms of the intensity, the evidence suggests not as well. You know, this is government and industry data that says we have got a worsening trend in the past 6 years. Our data that demonstrates in situ development is more greenhouse

gas intensive than mining is based on industry data and highlights in our report drilling deeper the in situ report card. So I think the data is quite clear that in situ, based on its requirements for steam, is more GHG-intensive than mining and that trend is currently outstripping any potential improvements.

Mr. {Waxman.} Mr. Dyer, are there technologies available that could substantially reduce greenhouse gas emissions for tar sands production?

Mr. {Dyer.} Yes, there are but unfortunately they are expensive. And, you know, if you are making decisions about whether to deliver, you know, a responsible product that has low carbon emissions, adopting expensive carbon capture and storage voluntarily is not going to happen. So I think we are in a situation where we have been facing other great environmental challenges in North America. If we are serious about cleaning up some of the worst aspects of oil sands development, we should be willing to regulate them. And clearly the evidence is that Canada so far hasn't taken interest in regulating the oil sands.

Mr. {Waxman.} So there are no operating carbon capture and sequestration projects now. One is being planned, as I understand it, but it is being heavily subsidized by the government. Absent such subsidies, the industry has no

incentive to deploy technology, is that right?

Mr. {Dyer.} That is correct. You know, there are dozens of projects in the regulatory queue currently in Alberta. And with the exception of the Shell Quest project, which will be built using taxpayers' dollars, none of those projects propose carbon capture and storage.

Mr. {Waxman.} Ms. Laboucan-Massimo, what is your view? Does the industry rhetoric about the sustainable development match up to the reality on the ground?

Ms. {Laboucan-Massimo.} In my opinion, no, it doesn't. What we are seeing is massive mines the size of entire cities. Pearl Mine will be bigger than Washington, D.C. What we are seeing is a number of in situ projects all over the region. I am from the Peace region. There is the Athabasca region. This region in total takes up the size of the State of Florida. We are talking about completely fragmenting or destroying a landscape the size of an entire State of the United States of America.

Mr. {Waxman.} The industry and Alberta government talk a good game but this is a classic example of greenwashing. The reality is that the carbon pollution from tar sands is growing very rapidly and the Alberta government is not willing to put the policies in place that would be necessary to change that. One claim we have heard repeatedly about the

Keystone XL tar sands pipeline is that if the U.S. doesn't take the tar sands crude, Canada will just send it to China.

Mr. Dyer, does Canada currently have the transport capacity in place for tar sands to send the tar sands to China instead of the U.S.?

Mr. {Dyer.} No. There is a small pipeline that currently goes to Vancouver but there is a major proposed pipeline the Enbridge Gateway project. That is facing even more opposition I would say in my estimation than the Keystone XL.

Mr. {Waxman.} Ms. Laboucan-Massimo, is this pipeline going to happen?

Ms. {Laboucan-Massimo.} No, in my opinion it will not happen. Over 100 First Nations are opposing this pipeline and over 80 percent of British Columbians themselves actually oppose the supertanker traffic that would need to be associated with the tar sands pipeline.

Mr. {Waxman.} Thank you. My time is expired. Thank you, Mr. Chairman.

Mr. {Whitfield.} At this time, I recognize the gentleman from West Virginia, Mr. McKinley, for 5 minutes.

Mr. {McKinley.} Thank you, Mr. Chairman. Melina?

Ms. {Laboucan-Massimo.} Yes. Hi.

Mr. {McKinley.} I am just curious if you could give me

a little insight. Does your group or something similar--do you support drilling for oil in the Gulf?

Ms. {Laboucan-Massimo.} In the Gulf? Well--

Mr. {McKinley.} Yes or no.

Ms. {Laboucan-Massimo.} No.

Mr. {McKinley.} Do you support drilling in ANWR?

Ms. {Laboucan-Massimo.} ANWR which is where?

Mr. {McKinley.} In Alaska.

Ms. {Laboucan-Massimo.} Oh, no.

Mr. {McKinley.} Do you support the Keystone Pipeline, the conception of it?

Ms. {Laboucan-Massimo.} No, I don't.

Mr. {McKinley.} Do you support surface mining for coal, like mountaintop mining, for example?

Ms. {Laboucan-Massimo.} Well, I have been to Kentucky and I have talked to people from there and it seems like the repercussions are similar to the tar sands so I would say in my opinion things have been sacrificed.

Mr. {McKinley.} Do you support the fracking technique to get to the gas shale like in the Appalachian Mountains or in Texas or wherever shale gas is located? Is that something that your group would support?

Ms. {Laboucan-Massimo.} For fracking?

Mr. {McKinley.} The fracking to get the gas out of the

ground there.

Ms. {Laboucan-Massimo.} No.

Mr. {McKinley.} So I am really curious where you are going with this. You know where I am going--

Ms. {Laboucan-Massimo.} Yeah.

Mr. {McKinley.} --and that is that we don't want oil, we don't want coal, we don't want gas, but yet we have a Nation that depends on those. But you are saying that I want us to use--and that is fine. I am going to support the all-of-the-above, the renewables--

Ms. {Laboucan-Massimo.} Okay.

Mr. {McKinley.} --but I don't understand your point because you are trying to ban this. The technique that everyone has used up here has been very clever, the focus on the 20 percent that is not in situ. In situ, clearly you have seen the pictures how environmentally sensitive it is for that but everyone seems to be focused, even from the folks on the other side of the aisle have been focused so much on the negative of surface disruption. But coming from the construction industry 45 years, I would challenge someone if they have not been on a golf course to see a golf course constructed. Millions of cubic yards are disturbed to have a golf course but at the end of the day everyone enjoys it. Surface mining, I have seen them use then, after the surface

mine, to use after the reclaim for shopping malls, schools, penal institutions. But you just always look at the worst side of it and that is during the construction. And again coming from a construction I don't think anyone ever likes a construction site during construction but when it is all done, when it is reclaimed, it is something positive. Why are you so focused on the negative?

Ms. {Laboucan-Massimo.} Well, what I am actually--

Mr. {McKinley.} Because you are not willing to get oil, gas, or coal--

Ms. {Laboucan-Massimo.} Well, it is actually asking for more of a transition away from oil and gas and the associated greenhouse gas emissions that are causing issues worldwide. We need to transition away from that and actually put our investments in renewable energy systems so we can actually have healthier communities.

Mr. {McKinley.} Okay, Mr. McCaffrey, if I could go to you just for a minute.

Back in May of last year, we had some testimony here in a hearing and there were issues. I would just like your comments that were given to us by--it said on a lifecycle basis, tar sands may emit almost 40 percent more carbon pollution than conventional fuel. Would you agree with that?

Mr. {McCaffrey.} No, I wouldn't.

Mr. {McKinley.} Okay. There was another testimony on the same day that--we have talked about pipeline safety because a lot of the opponents are trying to indicate that it is dangerous what we are doing. There was testimony said including the bitumen high pressure, including internal corrosion, abrasion, and stress corrosion cracks only weaken pipelines over safety. And then it went on to say that Alberta's scorched earth tar sands operations are the most destructive sources of oil on the planet. Would you agree with those statements?

Mr. {McCaffrey.} Absolutely not.

Mr. {McKinley.} Back to Mr. Smith. Can you touch on just a little bit about the revenue source, what impact your revenue source has been on the nation with Canada, what you have been able to facilitate in Alberta? Has that had a positive impact? Has that provided revenue to the country to get out of its own--

Mr. {Smith.} Well, there are significant studies done by major and reputable economic groups across Canada and the United States that talks about an oil sands barrel delivers more economic value to the United States than any other barrel that you use import or derived in the world today. Member Shimkus talked about Caterpillar and Michelin, Chicago Iron, the number of companies that are involved in the oil

sands--

Mr. {McKinley.} I know my time is essentially expired, but if we in America couldn't mine coal or can't burn coal and we couldn't use oil or gas, what do you think our role is as leaders? How long do we--

Mr. {Smith.} North America's economic recovery has always been based on reasonable and low-priced energy costs and will continue to be that way.

Mr. {McKinley.} Thank you very much.

Mr. {Whitfield.} The gentleman's time has expired.

At this time, I recognize the gentleman from Texas, Mr. Green, for 5 minutes.

Mr. {Green.} Thank you, Mr. Chairman. And let me for the record correct--there were some statements made earlier by our ranking member that talked about the Keystone pipeline was trying to get ahead of what is normally required for pipelines in our country. That is just not true. The Keystone pipeline has had, you know, one environmental impact statement with two supplemental and it was still approved by the EPA. So that is even more than the typical pipeline from Texas to Cushing, Oklahoma, that is the southern leg of it that the President supports. So there has been no exceptions. You know, when you have study for 2-1/2 years on a pipeline, you obviously are going to get a lot of reviews

so there have been at least one full environmental impact and two supplementals and approval by the EPA of the Keystone pipeline. And that is subject to even more reviews than our typical pipeline safety law, even the ones that we just passed that is now law. So the Keystone pipeline has been reviewed. Now, I don't know wherever the people get their information.

Let me ask some questions, though, of Mr. McCaffrey. A number of what happens at the oil sands is you are using cogeneration to natural gas to use to provide steam for the process in the in situ. How many of the current oil sands sites are using cogeneration?

Mr. {McCaffrey.} I don't know the exact number but I would guess that there are three or four that are doing it, but a lot more are starting to flag it as a very viable way to go.

Mr. {Green.} And you mention in your testimony the technology developed largely along reducing the steam-to-oil ratio in the in situ operations. Is that also a process that is being more expanded?

Mr. {McCaffrey.} Yes. The industry is very, very focused on reducing the steam-to-oil ratio and seeing great successes. And every quarter that goes by you see improvements. There are other companies besides ourselves

that are just putting great effort in as well.

Mr. {Green.} Is that natural gas produced somewhere close to the sites?

Mr. {McCaffrey.} Typically, it is in Alberta. It is quite often very close to the sites.

Mr. {Green.} Okay. So we don't have to worry about pipelines to bring that natural gas to your well sites?

Mr. {McCaffrey.} No, there is significant infrastructure in Alberta already.

Mr. {Green.} I know the issue is fresh water, even in Alberta but, you know, in Texas obviously hydrofracking has been very successful but it takes a tremendous amount of water. What happens to the water? Is most of it recycled?

Mr. {McCaffrey.} Yes, we recycle about 90 percent of it. And the water we originally use is non-potable so it is saltier water and it is from deep aquifers. We do not use any surface water, no rivers, no lakes in our operations.

Mr. {Green.} And what happens to that 10 percent--

Mr. {McCaffrey.} And I am referring to most of the operations in the south. Towards the north where it outcrops, they do need to use the Athabasca River.

Mr. {Green.} Okay. Also, Mr. McCaffrey, in 2010 Big K Energy Corp contribution and Greenhouse Power offset 238,000 tons of GHG production. Was that based on the In Situ Oil

Sands Alliance or where did that number come from?

Mr. {McCaffrey.} That comes from our own operations and we are planning to put in more cogeneration because of the benefits we see on our future phases right now.

Mr. {Green.} Okay. Mr. Smith, Ms. Massimo writes in her testimony the government of Alberta actually allows the industry to self-report in this system where there is no independent third party regulating. Is that true?

Mr. {Smith.} The Energy Resources Conservation Board is an independent regulator. In fact, you can go to a website today with the Department of Environment and see active air quality life on a real-time basis. The maximum flow from the Athabasca River that the oil sands companies can extract in its development does not exceed 4 percent. So there is extensive water conservation, water management, and it is independently regulated at this point through rules and permits.

Mr. {Green.} I was wondering because our gas wells that we hydrofrack, obviously OSHA has access to those sites and EPA has those on the U.S. side, so I assume Alberta has some of the same government oversight regulations. You can send an inspector out and verify whatever self-reporting is being done?

Mr. {Smith.} Absolutely.

Mr. {Green.} To verify that number.

Mr. Dyer, in your testimony, based on approved water licenses and current proposed projects where they draw 15 percent of the Athabasca River flow during the lowest period introducing fish habitat, if the producers are going to move to in situ production in order to reach the resource, if it is doing so, they are not going to use fresh water instead of using recycled water is the testimony. In your statement, what was your basis for, ``based on approved water license, the 15 percent of the river's water flow?''

Mr. {Dyer.} A basic problem with your statement there, companies are not moving to in situ oil sands development. Oil sands mining is expanding and it is going to trickle. It is just in situ development is actually expanding at a fast rate. So we are still going to see three times the impact on the Athabasca River from mines. It is just because more in situ--

Mr. {Green.} Okay. Well, you are talking about the strip mining?

Mr. {Dyer.} Yes, that is correct.

Mr. {Green.} Okay, but--

Mr. {Whitfield.} Gentleman--

Mr. {Green.} --Mr. Chairman, I understand that 80 percent of the production is going to come from in situ and

only 20 percent from the strip mining is my understanding.

Mr. {Dyer.} Yeah, that is correct--

Mr. {Green.} Okay.

Mr. {Dyer.} --but we have only produced 3 percent of the bitumen so far so there will be lots more cumulative effects for both mines--

Mr. {Whitfield.} At this time I will recognize the gentleman from California, Mr. Bilbray, for 5 minutes.

Mr. {Bilbray.} Thank you, Mr. Chairman.

First of all, I guess I need to clarify some items that the representative from Greenpeace was able to bring up. Your concerns about oil or natural gas, how about does Greenpeace support corn ethanol and the use of corn ethanol in the mandates?

Ms. {Laboucan-Massimo.} I can't comment on that right now.

Mr. {Bilbray.} Okay. How about the expanded use of algae production for the--

Ms. {Laboucan-Massimo.} That is also not my study of expertise.

Mr. {Bilbray.} No alternative fuels. Okay.

Mr. Smith, I have some real questions. As somebody who has been involved in the environmental movement in one way or the other since 1970, I am just trying to think of a country

anywhere in the Western Hemisphere that is at least historically been perceived as environmentally sensitive. I cannot think of a country that at least the public perceives as environmentally sensitive than Canada. In fact, I remember operation Canadian Bacon was the way we were going to attack you guys was we were going to throw trash into your parks.

Mr. {Smith.} I think, Mr. Bilbray, we also said we walk amongst you undetected.

Mr. {Bilbray.} And we worry about that. Has Canada made such a huge shift from its history of being the environmental leader of the Western Hemisphere, leader in everything from, you know, renewable resources to greenhouse gas control? How can I sit here and believe that Canada has totally abandoned its standard of environmental protection that has historically been there and taking a walk on this issue? Has Canada been taken over by some evil foreign force and forced you guys to have to trash the environment?

Mr. {Smith.} Well, Honorable Member, Canada and resource-producing provinces of which there are now six have responsible permitting, they pay attention to changing environmental conditions, to they pay attention to that triple bottom line of environment, social values, and corporate profit. We have been able to weather a serious,

serious recession because we do produce a great abundance of natural resources and natural minerals and products. We continue to clean up oceans and fisheries and ponds--the Sydney Tar Ponds, for example. We have environmental records of excellence. I think that as we grow, we are going to continue to get better and better about defining surface reclamation.

One of the issues is that we are transparent. We are not afraid to put our record out front, have the discussion, have the debate, and where we can find need for change, we implement change. And it not that anything has remained static, neither the development of the resource, nor the regulations that surround it. So it is an ongoing process. There is dynamic tension. We still import in excess of 700,000 barrels a year on our east coast a day. And I believe that we can replace that with oil sands crude. Once we do that, that oil sands crude will then go into eastern markets in Canada and we will also find a gateway to foreign shipping. In fact--and I thank the U.S., for Congress to give that permission to build that pipeline from Cushing to the Texas Gulf Coast because that is going to increase the abilities for your refineries to use Canadian crude and not crude from hostile jurisdictions that really want to take the money they gain from selling oil to you and use it against

your interests.

Mr. {Bilbray.} Now, I remember we were negotiating with Mexico about an oil line back in the '70s and the '80s and there were those that stood in the way. That oil now, instead of being transported through a pipeline, is being transported through trucks and tankers. And actually, a lot of those tankers are going into Houston as we speak. My question though is you have pointed out--who is Canada's number one trading partner in the world?

Mr. {Smith.} You are.

Mr. {Bilbray.} Who is America's number one trading partner in the world?

Mr. {Smith.} We are.

Mr. {Bilbray.} So we are sort of tied together here from that aspect of it. My question though is it appears to me when I look at the Keystone pipeline that the problem with the Administration is not the EPA, is not the water quality control people. There is no controversy on that side. It comes down to a 5-foot artificial barrier called the international border between Canada and the United States and that the issue is not issuing the permit for you to bring a pipe up to your side of the border and for us to bring a pipe up to our side of the border. That is what is being held up here. So my question is, is it true to say that this issue

really is not about the environmental impact in the United States, not the environmental impact on our water or resources in the United States, but more an issue about the United States trying to impose a regulation onto Canada and hold Canada to change its environmental policies and that the State Department--not the EPA--will not allow you to connect to a pipeline on our side unless you change something on your side of the border?

Mr. {Smith.} We are continuing to provide a safe, secure, reliable, geopolitical, sensible stream of product to a nation that needs the product desperately.

Mr. {Bilbray.} Thank you.

Mr. {Whitfield.} The gentleman's time is expired.

At this time, I recognize the gentleman from Texas, Mr. Olson, for 5 minutes.

Mr. {Olson.} I thank the chair and welcome the witnesses. I am sorry you are here today because of election-year politics. It was clear that something changed this past fall with the President's handling of the Keystone XL pipeline. The Department of State wanted the pipeline. The labor unions wanted the pipeline. The environmental activists didn't want the pipeline. The President ruled and deferred the decision because of the elections coming up this November. But one thing we have learned since that time is

the Keystone XL pipeline is safe. Why else would the Administration approve the first portion of it being built from my home State of Texas up to Cushing, Oklahoma, unless it was designed to be safe? Why would they do that? And the President still has an opportunity to do what is right for the economy, approve the full Keystone XL pipeline now. Unfortunately, he is still being misled by the environmental activists and the Hollywood elites.

The Keystone pipeline, not the XL pipeline, but the Keystone pipeline already brings Canadian oil sands crude across the border, across that aquifer in Nebraska and to Wood River in Patoka, Illinois. The exact same oil is flowing through the pipeline right now across the border to the United States. The protesters that surrounded the White House are waging a new war against Canada's oil sands. It has happened already. And as we have heard from the witnesses today, Canada's oil sands present an incredible opportunity for American energy security. Coupled with White House Press Secretary Carney's admissions that we have ``world-class, state-of-the-art refineries on the Gulf Coast,'' we can ensure Americans have access to affordable energy for our children and our grandchildren.

My first question is for you, Mr. Smith. Some claim that the Keystone XL pipeline is designed to ship oil from

Canada through the United States to our ``world-class, state-of-the-art refineries on the Gulf Coast'' and out to Asia. But if you simply look at a globe you would see that Canada's west coast is much closer to Shanghai than it is to Houston. And on the same globe you might find a pipeline connecting Alberta to the Gulf of Mexico is a lot longer than a pipeline connecting Alberta to the Pacific. Why is the Keystone XL pipeline being proposed?

Mr. {Smith.} Well, Honorable Member, I was here when Keystone I was approved and had its presidential permit. Oil sands crude has been reaching markets in the United States since the 1980s. It continues to grow. Production continues to grow. It creates opportunities, it creates jobs on both sides of that border, and I believe that ultimately we can have a North American answer to energy security and independence with reasonably priced energy prices that will stimulate economic recovery in both countries.

Mr. {Olson.} How does building a pipeline through the U.S. an efficient means of accessing Asian markets?

Mr. {Smith.} Each time you touch a barrel of oil, it becomes worth more money and thereby more expensive. So if there is a market closer, that is where the shippers go. That is where the producers would like to provide that produce. So it is a reach to think that you would move into

a big ship that has a proclivity for a spill and it is also very expensive. So I would be very surprised, particularly in light of refinery closures on the northeastern side of the United States that oil reaching the Texas refinery complex would go anywhere else but the United States of America.

Mr. {Olson.} Yes, sir. Thanks for that.

One more question for you, Mr. Dammer. We have heard from Mr. Smith on how Alberta achieved basically energy independence and the positive effects that oil sands have had on their economy. And I saw a very similar thing in my home State of Texas about 3 weeks ago with the Eagle Ford Shale Play. A little different source of energy, it is true oil and true natural gas, but the exact same thing is happening in many cities across Southeast Texas. In very underprivileged cities, underprivileged counties, one example in Dimmit County the sales tax revenue has gone up 300 percent, the property tax revenue has gone up 400 percent making a real difference in the quality of lives of those people in my home State.

And I mean if the United States had the same attitude toward oil shale, do we think we could have similar results across the country, not just what you experienced in Alberta and what we are experiencing in Texas?

Mr. {Dammer.} Yes. Absolutely. As I said in my

testimony, there are over 30 companies working on oil shale R&D here in the United States, and many of them have shown a lot of promise. Shell is working in situ; Chevron, Exxon, some of the larger companies are spending billions of dollars in trying to release the huge reserves that are locked in the Permian Basin. I think the problem we have here in the United States is we have no national program similar to the one that they put together in Alberta that directs the types of research and development toward these resources. We throw programmatic EIS at it, we do oil shale regs and then we revoke the oil shale regs and then we do another programmatic EIS. And that is why I brought up the fact that we have on the books a law, Section 369(i), that calls for a national program to develop these resources. And I think if we followed the presets of that law, we would safely and comprehensively start to develop those resources.

The reason why Shell is having so many problems in Colorado is they have no assurance that they will ever get out on the federal land.

Mr. {Olson.} I am over my time, Mr. Chairman, but I want to thank our witnesses from Canada. As a former military veteran, thank you for standing beside us in the War Against Terror. I know over 200 of your brave men have given their lives beside us in Afghanistan. I really appreciate

that. We will stand beside you. I yield back.

Mr. {Whitfield.} At this time I recognize the gentleman from New York, Mr. Engel, for 5 minutes.

Mr. {Engel.} Thank you very much, Mr. Chairman.

I really have an open mind about this. I believe very strongly that the United States can never be totally free in our foreign policy and such similar matters unless we wean ourselves off of oil that we get from unfriendly nations, and I think that Canada certainly is the friendliest nation. So I think that there is potential there, but I am concerned about the environmental difficulties. So I have just a couple of questions.

Canadian tar sands obviously aren't regular oil. They are highly corrosive and very carbon-intensive. And obviously as lawmakers we have to evaluate the immediate health and environmental consequences of tar sands production, weigh our obligations to leave full functioning ecosystems for future generations and consider our responsibility in terms of adding greenhouse gas emissions to our planet. I take those responsibilities very seriously, and obviously, everything is a balance.

In January 2012, Canada became the first nation to withdraw from the Kyoto Protocol. Now, we have never joined it so in a way people that live in glass houses shouldn't

throw stones. But when Canada withdraws from it, I wonder why. It makes me suspicious. Every oil sands developer claims they can clean up the bitumen production with better technology, but from what I have seen--and please correct me if I am wrong--this technology doesn't yet exist, and the hard truth is from what I can see, the energy industry hasn't been really investing much in innovation.

And I say this because according to Forbes, big energy companies devote barely 0.3 percent of their sales to research and development and many have ended their R&D programs. And if the technology worked really well, it would use less energy and steam over time to produce more bitumen. But exactly the opposite has happened. In the late 1980s, 2.38 barrels of steam was considered to produce a barrel of in situ bitumen and in 2010 the steam industry average increased to 3.3 barrels. So that is a 50 percent decline in efficiency over a 20-year period. So I don't know. You look at the energy companies, they profit from commodity price increases, not ingenuity. So it is almost a disincentive for them to come up with these things. So I am concerned about development without proper fiscal, political, and environmental safeguards, and I would be happy if anyone would want to comment on what I have just said, either people from the industry or others as well. Mr. McCaffrey?

Mr. {McCaffrey.} Sure, I would happy to.

Just speaking from our own company's perspective, our numbers are we design our plant for steam-oil ration of 2.8, which are the numbers you are referring to. We are currently at a 2.4. We are targeting to get down to 2. We have got technology that we think can be implemented now and that we are working on getting implemented to drive us in that direction. And some of the other companies in the area are also moving in that direction and they are being successful at it. So the technology that may have changed over time would have been cyclic steam technology is now steam-assisted gravity drainage, and that is a far more efficient process. And directionally, we are seeing good gains in that area.

Mr. {Engel.} Mr. Dyer, didn't you in your testimony say that the tar sands are not getting cleaner and that technology is expensive and therefore that is the reason? Would you disagree with what--

Mr. {Dyer.} Yeah, that is correct. There have been improvements since 1990, as I mentioned, but in the past 6 years we are starting to see declining intensity. I think, you know, if the industry is confident that improvements will still happen and we have innovation there, I think you would see them embracing the ability to demonstrate that through regulation and through low carbon fuel standards that would

enable low carbon fuels to compete.

Mr. {Engel.} Let me ask you this question. And anyone who wants to answer it may. What happens if these pipelines are not built? Will Canada continue to produce tar sands oil for the U.S. and Canada? Will it run out of customers before it runs out of product? What happens if this is not built? Mr. Smith?

Mr. {Smith.} Thank you, Honorable Member. Yes, we will continue to increase production in this process. They will find alternate markets. Oil is a fungible commodity, which means it can be exchanged around the world on a computer transaction or a moment's notice, and I believe that more and more of that will happen. They will find outlets for direct shipment either to the east coast or through--there is a pipeline, the Kinder Morgan Trans Mountain pipeline that was built by Becton back in the '50s. That line has a corridor and can be doubled in size without great difficulty. That takes care of 400,000 barrels. 500,000 barrels can go to eastern Canada to replace foreign import that we import. So we can find a market for a million plus barrels.

It is also important to mention that we have received tens of billions of dollars of investment from sovereign-owned companies from around the world, including China, Korea, and the Middle East. So in fact they are realizing

that we have a fungible commodity.

I just also want to talk to you briefly--and Dr. Isaacs may want to supplement. We have a fund in Alberta that has contributed over $230 million simply in the last 3 or 4 years to better improving technologies for greenhouse gas reduction, energy efficiencies, and better practices in the oil sands. Our surface disturbance in the oil sands today is about the size of the city of Tampa. The size of the oil sands deposit is about the size of the State of Florida and we will be reclaiming that. And I am not sure that Tampa will ever get reclaimed. So we have a mine plan that goes forward every time and they have to provide reclamation programs to get things back equal to or better than--which is the watch word of the Department of Environment.

Mr. {Engel.} Thank you.

Mr. {Whitfield.} The gentleman's time is expired.

At this time, I recognize the gentleman from Virginia, Mr. Griffith, for 5 minutes.

Mr. {Griffith.} Thank you, Mr. Chairman.

I guess I am somewhat curious. If the oil sands are going to be used anyway even if we don't build the pipeline, then I guess I am kind of curious as to why all the opposition to the pipeline, and I am wondering if any of you all can--start with Dr. Isaacs. Can you give me some

explanation as to why, if the oil sands are still going to be used, why someone would oppose this pipeline coming into the United States? From a U.S. perspective--I know you all are mostly Canadians but can you all understand that?

Mr. {Isaacs.} No, I can't understand that.

Mr. {Griffith.} Can you understand that, Mr. Dammer?

Mr. {Dammer.} No, I don't understand that at all.

Mr. {Griffith.} Doctor?

Mr. {Nenniger.} I am sensitive to some of the issues but I am not sure that is the right way if, you know, you are concerned about carbon emissions that really is effective.

Mr. {Griffith.} All right. Mr. McCaffrey?

Mr. {McCaffrey.} No, I don't understand it.

Mr. {Griffith.} Mr. Smith?

Mr. {Smith.} We are already shipping 1.7 million barrels south and also if I were receiving oil, I would want it in the safest way possible in the newest infrastructure possible.

Mr. {Griffith.} Let me touch on that in a minute, Mr. Smith. I have heard previous testimony about shipping it the way that we are shipping it now in the United States, we actually have a bigger carbon footprint than if we build the pipeline. Is that accurate?

Mr. {Smith.} Well, if you bring it in by tanker load,

when you go quantity to quantity, the increased amount of emissions from tanker traffic than by pipeline.

Mr. {Griffith.} All right. And you talked about safety as well. Is there more likelihood of accidents if you are doing the tankers?

Mr. {Smith.} Well, it is your safety program, Honorable Member, and it will be a pipeline built by Americans, supervised by Americans and made safe by Americans. That includes union and nonunion labor.

Mr. {Griffith.} All right. I appreciate that.

Let me ask you as well, Mr. Smith. You know, we always hear that the U.S. possesses only 2 percent of the world's proven oil reserves. Now, we know that that is because proven reserve estimates only account for oil fields that are currently being produced. However, not long ago Canada had a similar proven reserve figure to ours. Did your government accept that Canada's proven reserves in 1994 should mean that there should be no new oil exploration?

Mr. {Smith.} No, it did not. What it meant was that we had to find a way to publicly quantify and qualify these reserves. The oil sands reserves are based on public record of 56,000 wells and 6,000 cores. Drilling records and core samples remain intact today and they can be viewed by anybody from this community. And I believe that much of the

criticism that we get from the oil sands is our own fault because we are too transparent, we might be too apologetic, we might be too Canadian.

Mr. {Griffith.} Well, I am not sure I would go there, especially as an American. I don't want to accuse you of being too Canadian. But, you know, does this not say to us that the United States can learn that if we go out there and we look for new ways to discover new ways to use what we have in our country that we can in fact discover new ways to use what we have and come up with a greater percent than the 2 percent that we always hear bandied about in the press when the President tries to give us math lessons?

Mr. {Smith.} One of the great things that Canada and the U.S. share is technology development, innovation, and germination and pollination between companies. And whether it is horizontal drilling, measurement while drilling, hydraulic fracking, production of gas from shales, production of liquids from shales, production of oil from shales, these technologies are shared across the border. The 49th Parallel doesn't mean much when you are moving technology throughout. And I think that the Bakken Field in North Dakota is a very good example of that.

Mr. {Griffith.} So you would generally agree with me that we probably have greater than 2 percent if only we would

use our resources, is that correct?

Mr. {Smith.} Yes.

Mr. {Griffith.} Yes. Dr. Isaacs, your testimony states that only the U.S. and Canada are the only developed countries that can dramatically increase oil production. There are other parts of the world that are producing large amounts of oil and will experience some growth, but are any of the other countries in the world that are expanding their growth, are they committed to producing oil with comparable environmental sensitivities to that of the United States and Canada?

Mr. {Isaacs.} I don't believe they are.

Mr. {Griffith.} And so would I be correct in believing that by not allowing the United States and Canada to expand our use of our natural resources, we may in fact be creating a greater problem worldwide with pollution than if we are allowed to use with our sensitivities to the environment are allowed to use our natural resources? Is that true?

Mr. {Isaacs.} I think it is very possible, yes.

Mr. {Griffith.} I appreciate it and I yield back my time, Mr. Chairman.

Mr. {Whitfield.} At this time I recognize the gentleman from Louisiana, Mr. Scalise, for 5 minutes.

Mr. {Scalise.} Thank you, Mr. Chairman, and thanks for

having this hearing on the American Energy Initiative. I know this has been a series of hearings that we have had on this in addition to the legislation that you have brought forward through this committee to help our country become more energy independent. And at the end of the day when we look at the skyrocketing price of gasoline and projects are it is only going to go higher, I think most people recognize that supply does have a factor in price. You can't ignore that basic fact of economics. And we have done a lot of things in this committee not only to increase the supply in America, to open up more areas that are currently closed, but also to create what would be hundreds of thousands of new American jobs that would go along with it. And of course here with the Keystone XL pipeline proposal, I know we have seen projections that on the low end there would be 20,000 new jobs created, over $5 billion of private investment that would be brought in, not this federal stimulus program of spending money we don't have but actual private investment to build this pipeline.

Mr. Smith, if you can address the jobs issue because there have been some that have criticized that not enough jobs have been created or that the 20,000 number is not accurate--I have heard it is even higher but there are some suggesting it is lower as if only a few thousands new jobs is

a bad thing, they oppose that. If you can address the jobs issue on what the estimates are that Keystone would create in America, the United States.

Mr. {Smith.} Well, what we do know is that economic recovery is always based on reasonable energy prices or energy prices that are more competitive than the balance of world markets. To construct that pipeline, it is my understanding that it is a shovel-ready project, requires no taxpayers' dollars, and the number of direct and indirect jobs have been wildly debated. And I believe that the number of 20,000 immediate jobs in a country with 8.3 percent unemployment would be significant.

Mr. {Scalise.} 20,000 immediate jobs. And in the long-term, what estimates do you have there?

Mr. {Smith.} I think the long-term is probably more difficult to calculate because as you move into economic recovery with reasonable and secure energy prices, you do ramp up over all economic activity. So I have heard in the range of 50,000 indirect.

Mr. {Scalise.} Great. And, you know, of course some, including the President are suggesting they need more time for environmental concerns and all of that. And of course one of the facts that they leave out is that even if the President were to approve Keystone, which, you know, has been

on his desk for over 3 years and there have been environmental studies that have suggested it would be a positive thing to do, each State would have to permit it, even Nebraska where, you know, there has been a lot of attention given to Nebraska's route. The State of Nebraska would still have to issue a permit before the pipeline could be built even if the President said yes, which of course the President has not. Is that correct?

Mr. {Smith.} That is my understanding.

Mr. {Scalise.} Yeah. And so, you know, as the President tries to say he is for an all-of-the-above energy strategy, you are not for all-of-the-above if you say no to Keystone and so many other things that we have seen him say no to.

There is one final question as a follow-up to my colleague from Virginia asked on this 2 percent--because I know the President said this; others have suggested that in America there is this finite 2 percent amount of all the world's known reserves. And of course in Canada they were using similar numbers even going back to 1994 numbers before of course some of the new technologies came out. And as many know, you know, that known number of reserves only counts where there is actual production. If you are shutting an area off to exploration, there could be a vast amount of

reserves that are there; we just don't know about them because the Federal Government won't let them go there. How did you all address that in Canada when you had a similar kind of smaller number of known reserves before the new technologies were allowed to advance?

Mr. {Smith.} Well, Honorable Member, that is an important distinction. The resources are managed by each individual province/state if you will. They have an independent jurisdiction and the federal government is basically forbidden by the constitution to interfere in the orderly development of those resources or the trade and commerce of the provinces with those resources. So my direct experience was transparent records, environmental surveillance, a keen and strict regulatory process, and an ability to communicate that throughout the jurisdiction. Even with this great amount of debate, continually polls across Canada support the orderly development of the oil sands.

Mr. {Scalise.} Well, thanks. And then the final question, Mr. McCaffrey, if you look at Canada's oil field discovery, it increased their proven reserves by an order of magnitude of multiple times over. Can you kind of give your commentary on how this was accomplished?

Mr. {McCaffrey.} I think it is through the advancement

of technology. We continue to see incredible improvements in terms of the recovery factors and being able to demonstrate those recovery factors. And I think it really echoes the point of the sheer size of that resource that is commercially recoverable. And we have a large number of customers from the U.S. right now on the Gulf Coast that are very interested in connecting with the supply. So as this supply has come on, as it continues to improve in efficiencies, there is a vast majority of the refineries on the Gulf Coast that have come up on a regular basis saying we need the crude; we have got to get the crude. And that is the only thing is the pipeline that is preventing the customer from getting the supply it needs.

Mr. {Scalise.} Well, thank you all for coming and thanks, Mr. Chairman. I yield back the balance of my time.

Mr. {Whitfield.} Thank you, Mr. Scalise. And I want to thank those members of the panel for being here today. We appreciate your testimony very much. And I do think that this hearing brought to a clear focus the different policies in Canada and in the U.S., and because of Canada's policies they have gone from a net importer to a net exporter. And we recognize that there are many groups that sincerely do want to stop the exploration, production, and use of fossil fuels, but the reality is for our transportation needs we don't have

any alternative right now. So this hearing has really been helpful and we appreciate your expert testimony.

And with that I will adjourn this hearing and we will keep the record open for 10 days for any materials that need to be admitted. Thank you.

[Whereupon, at 12:13 p.m., the Subcommittee was adjourned.]