March 16, 2013

Brussels Forum

Growing U.S. Energy Self-Sufficiency & the Global Consequences

Mr. Craig Kennedy: Okay, welcome back. We're really glad to have you here for this next session focused on Energy. Come on in and we have asked the editor of Internationale Politik, Sylke Tempel, to be our moderator. Please.

Ms. Sylke Tempel: Good. Welcome back, ladies and gentlemen, hope you enjoyed your afternoon coffee. What we see is a short video clip rolling first and then we go onto the panel discussion. So stay with U.S..

Unidentified Female: The United States is well on its way to become self-sufficient in oil and gas and could overtake Saudi Arabia as the world's biggest supplier of hydrocarbons in 2020. Will the abundance of shale gas and oil lessen U.S. strategic interests in the Middle East? What does the booming oil and gas sector mean for the renewable energy sector? What

energy sector innovations can we expect in the future?

Ms. Sylke Tempel: Wonderful. I hadn't seen this video before, but after you--actually, you know, it lines out all the questions that we want to explore in this panel. And I'm very happy to introduce--of course, all these panelists are very distinguished, but I'm proud to say this is a very, very distinguished panel.

I'll introduce from left to right. Dr. Fatih Birol, who is the Chief Economist of the International Energy Agency, and I would say one of those people who puts some sense into what's happening in the energy field with the reports that you're putting out every year. The last one, by the way, is called "The Golden Age of Gas," which gives you a bit of a hint where we are going.

Next is Mr. Iain Conn, who is a regular on this panel at the Brussels forum. Happy to have you back again, who is the Group Managing Director at BP.

Senator Chris Murphy is one of the youngest senator--no, you're not the youngest Senator voted into

office It's a first for you on this panel. We're very happy to have you here. I've checked his voting record this afternoon and it was quite interesting because I thought, according to European standards, Senator, you qualify pretty much for leftie.

The Hon. Christopher Murphy: Let's keep that to ourselves.

Ms. Sylke Tempel: Don't tweet this, you know, he will have difficulties when he comes back to DC. And then last, but really not least is Carlos Pascual, who's the Special Envoy Coordinator for International Energy Affairs in the State Department, and actually, you will get the first question--a question that you've heard many times before, but I'm very sorry I have to ask you again. It's been part of this video as well.

The last time you answered this was at the Munich Security Conference. And coming back from a short trip into the Middle East, everybody's worried about the shale gas revolution, with the fact that by 2020, according to the IAE reports, the United States could

reach (inaudible) in energy or become an exporter even of gas and probably also of oil.

You might see in the future quite a bit less engagement when it comes to the Middle East, even taking into consideration that the Middle East has a pattern of drawing everybody back into the old quarrels. How do you see this? How do you reassure people who might have been quite a bit anti-American over the last decades, but would dread the thought that you might really be withdrawing?

The Hon. Carlos Pascual: I think the fact that Secretary of State was just there, the President of the United States is going, the Secretary of State is going with him again, is just on the face of it indicative that there is a serious engagement with the Middle East. But let me give that a little bit more depth and I just want to add one thing to the context of this.

Over the past five years, U.S. oil production has increased by about 35 percent. Over the past five years U.S. gas production has increased by about 25 percent.

And since about 2005, our import dependence for oil has gone from about 60 percent to last year, about 39 percent.

The story isn't just the increase in production. It's also been the emphasis on efficiency, and we can't forget that. The importance of keeping the emphasis on driving down the consumption of energy and becoming more efficient in the use of it is absolutely key.

Now, the reason why I've been consistently saying--but it's not just me, the previous Secretary of State has said it, other senior officials have said it, that the United States still remains and retains an interest in the peace and stability in the Middle East and security of transit lanes and global peace and stability is that increasingly we're dealing with global markets. Oil is a global market. Gas is increasingly becoming a global market. And when you have instability anywhere in the world, when it affects prices, we pay that back at home. It still affects what we pay at the pump. It affects the competitiveness of

our economy.

The kind of risk that we face has changed. The risk of the access to supply is not what it might have been a decade ago or 15 years ago. But we all still face that same fundamental issue, that instability in global markets is going to have an impact on price.

The other point that, I think, is absolutely key to keep in our minds is that global demand for energy is being driven by the non-OECD countries. Last year was the first year where the non-OECD countries exceeded the OECD in terms of consumption, and for the future, the market drivers, the ones that are going to be driving price, are going to be countries like China and India.

And so ironically, we now have an interest in understanding how they are going to satisfy their demand because that demand is going to be the key driving point of global prices. So for all of those reasons, I think we still retain a tremendous interest in seeing peace and stability in the Middle East and

transit lanes and global security. It's something that we need to work on with international partners, but the United States simply cannot walk away from this.

Ms. Sylke Tempel: Carlos, can I follow up with a, I have to admit, quite a bit mean question? And it's about security the transit lanes. And in a way, it's the U.S. basically becoming or achieving a bit more autarchy on its energy level. It's the emerging countries who really are most dependent on imports, also from the Middle Eastern region. It's the emerging countries and economies who profit most from secure transit lanes.

So does that mean that the U.S. is also doing a bit of the job that they are dependent on? Are you doing a bit of the job for them?

The Hon. Carlos Pascual: I think the United States certainly has made an investment in global security in which the entire world, actually, gets some dividends. And so one of the things that we have consistently been doing as part of our dialogue with countries throughout

the world, with China, with India, with Japan, with others, is that as we talk about the changing global energy situation, the security of transit lanes is part of that discussion. And we have to recognize the stake that countries have in maintaining the security of those lanes.

If you think about the Strait of Hormuz, 75 percent of the oil that goes through the Strait of Hormuz goes to Asia. A tiny fraction of it actually goes to the Western hemisphere. And so the United States obviously retains an interest in this because if there are major disruptions, the price of oil can increase significantly. It's going to have an impact on all of our markets and all of our economies.

But it's something that all countries around the world definitely have to have a stake in and have to have an awareness of, because they're affected as well and they have to have recognition of the role that we play and ways in which we might be able to cooperate on this in the future.

Ms. Sylke Tempel: Thank you. Iain Conn, I'd really like to get your take on the geopolitical impact of what we call the shale gas revolution. We know that there has been quite a bit of skepticism in it, but mainly in Europe and mainly when it comes to the technologies of extracting it, fracking and quite a probably bit overdone enthusiasm in the United States. So what would be your take on this?

Mr. Iain Conn: Well, let me try and explain why this is so important. It takes about a barrel of oil's energy for every $1,000 of GDP in the world, in fact 1.1 barrels. So when the oil price is $25, it doesn't matter much. When it's $110, it matters a lot, and $120 on average is what it costs to generate every $1000 of GDP. That's the amount of energy. So the theme of this conference is about fragility. I think one can also say, in this matter, it's about agility for the United States and probably fragility for Europe.

Let me just give you a couple of examples of the implications. In our view in BP, this year in 2013,

it's possible that the United States will overtake both Saudi Arabia and Russia in the production of liquid fuel. That's extraordinary. By 2030, we believe the U.S. will be energy independent. And something that a lot of people don't realize, 58 percent of the U.S. trade deficit is because of energy. So if the U.S. becomes energy independent, suddenly a very large part of the imbalances of its economy disappear. It changes the way the U.S. can be confident in its projection internationally in a defense sense. And the implications for the rest of the world also include the fact that today the United States has a $20 a barrel discount for its oil, i.e. its oil use, and it has about a $90 a barrel discount in the cost of natural gas relative to Asia.

So the U.S. has now got a huge competitive advantage. I think that's great for all of us as we're thinking about restarting the world's economy, but Europe and China, I think, are the ones that should be worrying the most about this in a relative sense. So my

last point would be this is great agility for the United States and there's relative fragility implications for Europe and other dependent regions such as China.

Ms. Sylke Tempel: So what would you recommend, then, to counter this fragility that you see for Europe, mainly? And I guess that you base this assessment of fragility for Europe on the fact that Europe just, almost quite like Japan, doesn't have own natural resources when it comes to energy, so they're highly dependent on the imports or new technologies like renewables, which we know are still pretty expensive, but that might change in the long run. So where to mend this?

Mr. Iain Conn: Well, the reason the United States has done what it's done is the shale oil and gas or tight oil and gas are very present in the U.S. But there's more shale gas and tight oil likely in Asia than there is in the United States.

The reason why it's happened is three things. There

are 2,000 land drilling rigs in the United States and there have been for the best part of 100 years. The second is the U.S. is criss-crossed with pipelines, and you can plug something in when you find it. But the third and the most important thing is in the United States--and I thought it was only the United States, but I found out last night that it's Latvia as well--if you own land, you own the mineral rights. And that is the third and probably the most important reason why it's occurred so fast in the U.S.

And for me, the implications for Europe are simply that Europe doesn't have those factors. Europe is more dependent on imported energy. And although Europe is benefitting, if I can call it that, by cheap coal coming from the United States as a result of this, Europe's cost of energy for the economy is going to be higher than the U.S. for the foreseeable future. And I don't see an easy way to resolve that. But we can come back to that a bit later.

Ms. Sylke Tempel: I'm sure. Talking about

fragility, the report of the IEA on shale is not enthusiastic, but it's optimistic, if I've called and seen correctly. However, I would like to see--much of the shale Revolution in the states was done by what you call mom and pop firms. It's not the big companies, it's more the firms, from what I understand. But we've seen quite a few of them also go bust because their resources are not quite as promising, because the gas price is so low right now that it's not really promising to drill.

Is there some fragility in this market? Do you see that there might be a bit of a bubble there?

Dr. Fatih Birol: I mean, there are several challenges for U.S. and for Europe, I should say. For U.S., what Mr. Pascual said, is completely true. Only five years ago, the share of coal in the U.S. representation was about 50 percent, about half of the representation came from coal. And today, in five years of time, it went down to 30 percent. A big drop because shale has penetrated this.

Why? Because natural gas prices are very, very low and it provides economic competitiveness, gas versus coal. However, just as far as fragility, once you don't think that the U.S. gas prices will stay forever at such levels, in order to get more natural gas production, shale gas production, gas prices have to go up. And then we may well see a comeback of coal, if the gas prices go up, in order to induce new investment for shale gas production. This is one.

Second fragility is for Europe. First of all, many colleagues in Europe thought and we discussed with them a couple of years ago in Brussels and elsewhere so there's a shale gas evolution in the United States, so since we don't produce any shale gas, it is not advantageous for us, which proved to be completely wrong. One thing I can tell you, before we entered this room, if you made a small survey for all the colleagues coming here--even though I know not everybody's working on the energy--last year, which countries had the highest amount of coal consumption in the world?

Everybody would say China, then India, Indonesia, et cetera. And we would be all wrong. The highest that was in coal consumption was in China, but the second highest for coal consumption in the world was in Europe. In the last 40 years, for the first time, we have seen the highest amount of coal consumption in Europe, a region where the climate policy is in big letters.

The reason is that the coal, which left the U.S. markets because of the limited space for shale gas, was exported to Europe very cheap and the sister European gas prices were very expensive, everybody's going to have coal in Europe now, as we have very low carbon prices. So I say that after what happened in the United States does affect Europe and the rest of the world. This is the second.

Third point, I'm a little worried about the energy-intensive industries competitive of Europe. Iron and steel, petrochemical, cement, aluminum, which have a lot of energy costs in their total production level,

vis-à-vis, mainly the United States. I wouldn't say China because China gets about 75 percent of its energy from coal, which is very cheap, domestic coal, cheap and dirty. So the main problem for Europe and Japan--Japan is also a little on the high-cost level--on one hand, we will have a picture, high-cost Japan, high-cost Europe, versus low-cost U.S., low-cost China. So this will, I think, redefine the competitiveness in the next years to come, in addition to geopolitics.

In fact, I can add one word here, I agree with Ambassador Pascual about the definitive engagement of the Middle East. But with the shale gas and the shale oil (inaudible), I am sure Secretary of State of the United States in the international negotiations is now sitting in his chair much more comfortably when compared to his predecessors because they don't need to import energy anymore.

And second is, while the U.S. is the clear winner, together with Canada and Australia, there is a clear loser here. We, of course, are talking about Europe, at

least we have to underline that, which is clearly Russia. Russia is losing for two reasons. One, amount of years Russia is going to export now will be significantly less than what they thought they would before the shale gas revolution. And, second, Russia and other traditional gas exporters' ability to shape the gas prices will be much less pronounced now.

There will be more markets which will decide on the gas prices. Therefore, the traditional gas exporters will lose from volume, quantity of gas they export, but at the same time, also the prices of that volume. So if I can summarize, this revolution, with the effect on the competitiveness and on the geopolitics of energy.

Ms. Sylke Tempel: So it cannot be overestimated really. So if we look at our balance sheet, stability, fragility, we would say there's definitely more stability from the perspective of U.S. when it comes to what we've called reindustrialization in the States, cheaper energy, there's probably more manufacturing, et cetera. But then on the fragility--and then of course

we have different impacts in Europe on Russia, as we've just heard. But then one of the fragility departments, and I might throw in another factor in the equation here, everything that has to do with climate change. It's been mentioned in the video clip. Hearing that coal has been used big in Europe or that coal might replace some other energies is certainly not good news when we think of climate, when we think of emissions, of course, et cetera, et cetera.

But my question to you, Senator Murphy, would be, where are we when it comes to green technologies? President Obama has just unveiled a new energy blueprint where he puts some emphasis also on green technologies. I do think he also means renewables. But with shale gas being such an easy way out, seemingly, providing the U.S. with cheap energy prices, where do you see the chances that there will be more investment in green technologies, renewables, research and development in fields that are very, very important when you take a longer-term view? Where do you come in

on this? How are the chances to put in some energy on green energies?

The Hon. Christopher S. Murphy: Well, first of all, I think we do celebrate the advancements that we've made on reducing carbon emissions. A 40 percent reduction in emissions from our automobile fleet is revolutionary. The fact that over the next 10 to 20 years, we're going to be taking 100 coal plants offline, just simply because of the insertion of gas, and potentially more if we end up passing new restrictions on new-source pollution that the EPA is currently considering. That's significant to begin with. But we are still at an absolute political log-jam when it comes to the issue of significant investment in green energy.

Many of us believe that the only way that you really incentivize a true green-energy revolution in the United States is to do what many countries in Europe have done, which is to create a real domestic marketplace for it. And you do that either through

capping the amount of carbon and allowing people to trade or by putting a new price on carbon with a tax. That can't happen in our political context today, simply because of the immense power of global warming deniers in the United States. So that, effectively, has cratered discussions about green technology.

Now, we still have a handful of subsidy programs and tax incentives, but even those are in jeopardy today. We have this separate conversation happening in the United States about tax reform. And what tax reform means is essentially eliminating a lot of the tax subsidies that have heretofore been the primary drivers of much of our green technology revolution, for what it is. So I think the essential element of your question is right, which is that you already had an enormous political barrier to a major investment in green technology, which is this debate that only happens in the United States about the science of global warming. And then on top of it, you've got the convenience of a

new enormous stability with respect to shale gas production.

I will say this, given the toxicity of the debates surrounding green energy, there's a lot of attraction to getting the two parties together on gas. That being said, we can't even do that very well. So we talk about the fragility versus stability, there's still some fragility surrounding this debate in the United States because as many pipelines as we have, we still have a capacity issue when it comes to moving this stuff around the United States. We have not really had the serious conversation around the environmental impact of fracking.

As you start to get into potentially more population-saturated areas of the United States, it's going to force, as it is right now in New York, I think, a much more serious conversation about environmental restrictions. And so, you know, there is still some open question as to whether political decisions can be made to protect these advancements.

And I think you're right that, for the time being, it provides a very convenient excuse for half of the United States Congress to sit on the sidelines when it talks about real investment in green energy. I think that's a tragedy.

Ms. Sylke Tempel: So this could be a lazy way out, anyway?

The Hon. Christopher S. Murphy: Yeah, I think it certainly is a lazy way out. And you can't argue with the numbers. I mean, we have added back 200,000 manufacturing jobs. Well, we're building steel plants again in the United States.

Ms. Sylke Tempel: That sounds so, so yesterday.

The Hon. Christopher S. Murphy: Yeah, right? I mean, and so there is an enormous attraction to just sitting where we are. But, you know, when you look at sort of the life-cycle carbon costs of extracting shale gas, there's not real good science out there to tell us that we're saving as much as we may think we are with respect to the ultimate carbon emission. And so if we

really want to be serious, ultimately, about being a player in global climate talks, then I think, as the evidence comes in, which is fairly new since we've only been doing this since 2008, that we're going to find that we can't be the contributor to the climate talks that we want to be, if we just sit still.

Ms. Sylke Tempel: When it comes to the climate talks, in a minute I'll ask you about it, but, Iain, I just wanted to ask you, a couple of years ago, for decades, BP's logo was this wonderful shiny oil drop. That's when we all believed in big oil, right? And then it was replaced by this wonderful green flower, and we got the impression that BP now is totally in the renewable business, you know, at least when you looked at their logo. But BP has been cutting down pretty much on everything that has to do with development of green technology, from what I understand. Clearly, aren't you missing out on developing technologies that might become much more important?

Mr. Iain Conn: Well, firstly, I don't think that we've stopped investing in this area. I think you'll find that we may be the largest investor in bio-fuel in the world. And you will also find that we put a huge amount of money into research, long term, on the way in which we evolve from being carbon dependent to being less carbon dependent. And our logo is still the same one and we have no intention of changing it.

So let me just explain because I think it's very important. The issue of climate change has not gone away and it will come back with a vengeance. The issue is, how does the world deal with it? And I want to just, if I may, just go back in time a little bit because I think we've been on an amazing journey in the last 20 years as a world.

Twenty years ago, nobody knew the words climate change. We then went through a period of what I would call visioning, when everyone said, we've got to fundamentally change. The world is going to be destroyed. We need to reinvent ourselves completely.

But when you actually ask people, tell me how you're going to implement something that's going to do that? Everyone said, I've no idea. Energy's far too large. Then we went into a period called alternatives, which I think's been fantastic because it's developed all sorts of alternative technologies. But it's also brought the realities about those technologies and how difficult it is to scale them up absolutely into the forefront.

And I think we're now on the edge of entering another phase, which I'm very encouraged about, which I would call pragmatism and less. When we talk about alternatives, they're all examples of more energy. None of them are examples of less. And we need to move to a period of less energy and pragmatic pathways to lowering the carbon intensity of the world's economy. And I still passionately believe that and so does BP. The question is, all right, what are those pragmatic pathways?

And I think the United States has just demonstrated what such a pragmatic pathway can be in the matter of

power. We've been advocating for some time that it's not all about alternative power today. It's about natural gas, lowering the carbon intensity of power production and innovation in alternative technologies and generation so that over time, you'll be able to see those materially grow. And they are the highest and fastest growing sector in the industry.

But the other thing we've been saying for some time is energy efficiency is absolutely key. Energy efficiency and lower carbon from natural gas is what we believe you need to do right now in the matter of power. And we don't actually produce much power. And the United States has just demonstrated exactly the benefits of this, 20 percent less coal in the mix, back to 1992 levels of $C0_2$ and a competitive economic advantage into the bargain. So absolutely, I fundamentally believe we will develop new technologies in order to deal with this energy equation, perhaps not fast enough, but in order to get to 2 percent or 2 degrees. But I do believe we're making material inroads

and the world of innovation in technology is far from gone. But we've been focusing on lowering the carbon-intensity of the economy, followed by the quantity of energy, followed by the cost, as a world. And I think we need to turn it a bit on its head and focus on reducing the quantity of energy-per-unit GDP, then the costs and then the carbon.

Ms. Sylke Tempel: You know what amazes me? Time and again, the issue of energy efficiency comes up. And, Fatih Birol, you've been writing extensively about this. You've been--basically this is the one song you've been singing for a long time. We need to be more energy efficient. But I'm still at a loss to understand, why haven't we gotten much better on this? Perhaps you can quickly give an answer on this?

Dr. Fatih Birol: First of all, I can perhaps correct two things. I have a couple of songs. It's not the only song that I sing. But it's my favorite song, it's my favorite song. The second thing, is let me make a remark. Since we talked about the U.S. and Europe,

this shale gas revolution, which happened to the United States, I believe, is a wonderful and unexpected gift from the United States to Europe, if Europe can make use of that.

Ms. Sylke Tempel: Well, that's a big question.

Dr. Fatih Birol: But let me just--why? Because after this shale gas revolution, gas markets were the markets of sellers. There were very few countries who were dominating the markets and you have to buy gas from them and you have to agree with their terms. But since the market picked-up in the United States, Canada, Australia, with the shale gas revolution, there are more sellers and the markets are becoming the markets of buyers now. The hands of the buyers, such as Europe, is getting stronger.

And let me give you one number. I don't want to give too many numbers, but, Europe, the problem with Europe today is Europe has a lot of long-term contracts of gas getting from different countries. And two-thirds of those contracts are going to expire within the next

10 years. These contracts will expire. So if Europe can lead the game and play its hands wisely, can renegotiate these contracts, look at the alternatives, and give a different price trajectory to gas used at home and can benefit from this substantially.

Having said that, I don't believe the gift of (inaudible) is to Europe, but a little bit one, but still a good one, so this is one.

Second in terms of climate change, what climate change, which climate change? Everybody's a different target and for us, it is important to, as the scientists say, to keep the temperature within two degrees Celsius. And if it comes to that, I cannot be very optimistic, to be honest with you. I am more on the pessimistic side, and natural gas is definitely can help to address this challenge when it (inaudible) to coal. But I don't believe, with all respect to my colleagues from the gas industry here, natural gas alone cannot bring us to our climate goals. We're still need efficiency. We still need nuclear power. We still

need carbon capture storage and we still need (inaudible).

And one of the biggest mistakes I believe Europe did was to put the question mark next to the nuclear power, both in terms of competitiveness, because producing electricity at lower cost, and second, and not emitting carbon dioxide emissions.

Ms. Sylke Tempel: I'm German. I've heard this message well.

Dr. Fatih Birol: Thank you very much. I'm from Germany. In Germany, I mean, today, in Germany we have one of the countries, which is the most carbon--coal-fired power plant built in the world, which is very, very interesting to see Germany being one of the most advanced scientific country as the U.S., so in the world.

Efficiency, last point. To be honest with you, I am a bit more optimistic about efficiency. In the last 18 months, at least, there are four examples in four

countries which make me hopeful on the efficiency. There's a momentum building.

China, in their five-year plan, a very strong target on energy efficiency. In Europe, we have an energy efficiency directive now. In United States, (inaudible) standards, fuel-efficient standards, which is one of the main factors which makes this--you mentioned autocracy for the United States because the success story in the United States is not only because of the increasing the production coming from North Dakota, but also reducing the consumption is the result of fuel-efficiency standards coming from Detroit.

So it's a success story of North Dakota and Detroit put together. And you will see such stories, but the driver of this efficiency momentum, is not necessarily climate change. It is mainly to bring the cost down, (inaudible) cost down, but it also helps the climate change, as well. But having said that, we are verified in the horrible trajectory now in terms of climate change. The best case is we are going to see a four

degrees temperature increase in the next years to come if we continue with this fuel policies what we have. (Inaudible) definitely divested in implications for our planet.

Ms. Sylke Tempel: And right at this point, last question before we go to the audience, to the two of you, Carlos Pascual and Chris Murphy, what is your take--perhaps be a bit more optimistic reaching a two degree goal, or on anything that has to do with an agreement on climate change. I mean, obviously there are two sides. One is technology and what we can reach through technologies, and a clever, smart energy mix. And the other is the part about agreements.

I'm not an optimist enough to think that in (inaudible) world like this, a Kyoto agreement, too, would be possible. But what will be your take? Where is it going, really? Perhaps you would like to start, Carlos Pascual.

The Hon. Carlos Pascual: Sure. One of the things we've seen since Copenhagen, then Cancun, then in

Durban, then in Doha, is that there have been significant steps forward, significant progress in defining the framework for a climate agreement, a recognition that all countries have a responsibility, that we all have a stake in this process.

That process is going to continue and it's going to take time. I think the issue that you're hearing from us here in this discussion is that we absolutely have to keep that debate going and continuing, but we can't wait to act. If we wait to act, then we're destroying ourselves because we can't afford this period of time. And so the question is, how do we take advantage of this period?

And I'd like to go back to the point that Iain was making, which is that the environmental impact of the changes that we're seeing right now depends on how we manage it. I mean, do it in a way that is sensible and gives us an opportunity or we can lose that opportunity. And a lot of it depends on the choices

that we take as governments and as companies and as individuals.

So let's go back to Fatih's point earlier. U.S. has the lowest CO_2 emission levels that we've had in the last 20 years. And the principle reason for that has been the switch from coal to gas. Gas has become the dominant fuel source in the U.S. economy. This revolution on gas is not just a U.S. revolution. It's not just a shale gas revolution and that's the other piece of this that I don't think the world is opening up its eyes to. You have, in Australia, significant amounts of gas that are coming on in 2014, 2015. Mozambique and Tanzania have had the largest gas finds in the last 30 years. Norway has had the largest gas finds it's had since 1942. Israel, beginning in April, could reach at a point where it actually turns on the switch, a point where it's 70 percent self-sufficient in gas and could have a potential to export in another five years after that.

The geopolitical changes that are accompanying this are absolutely massive. But if you look at this from a perspective that what opportunity does that create for China to switch from coal to gas and the mitigation that that can have on its CO_2 emissions? What impact can that greater availability in gas and global markets have on the use of oil or diesel for electricity consumption, which would not only have a greater impact on reducing CO_2 emissions, but would also put more oil into the global market and actually bring greater stability to the market as well?

And so, if you then start looking at it from that perspective, and we ask ourselves, okay, if gas is this bridging fuel, how do we make it that, a bridge? And what do we do in taking advantage of its integration of gas as a base fuel that can be combined with solar, that can be combined with wind power, that can be combined with geothermal? Which then brings us back to the questions of, how do we create incentives for

investment? And we have to take on those incentives wherever we can.

We have not had a perfect environment in the United States and I'm sure the Senator will talk about that further. But what we have tried to do is, for example, in the majority of our states now with renewable portfolio standards, actually creating the incentives to increase the mix of renewable energy and if you bring that together with gas, you can start to get the kind of synergistic combinations that Iain was talking about earlier before.

And so these are not the final solutions. But they are solutions that can significantly take down the rate of CO_2 emissions and put us in a much better position to act in five to ten years, as we continue to get technology developments because the key thing that we have to remember here is we can't wait. We have to act right now. And we have to take advantage of each of these technical opportunities that we have, whether they've been the advantages of gas as a lower carbon

emission fuel or the integration of gas with other forms of renewable energy.

Ms. Sylke Tempel: Thanks. Senator, your take on this.

The Hon. Chris Murphy: Well, listen, I think it's very kind to say that circumstances in the United States Congress have been less than ideal to enter into--

Ms. Sylke Tempel: Well, this is the forum (inaudible) understatement (inaudible).

The Hon. Chris Murphy: --climate talks. That was very polite. I don't have to be that polite. No, listen, you know, there's five percent of Americans that don't believe that global warming exists and there's about 40 percent of Congress that believes that. There's a fundamental disconnect between where the American public is on this issue and where the United States Congress is. And, you know, I think the world still shudders from a 98 to 0 vote in the United States Senate to reject the Kyoto treaty. And the

question is, is this president, who clearly has made it an imperative, just listen to his inaugural address, to lead the world in this conversation. Is he going to be given the latitude by the United States political infrastructure? And I think that is still an outstanding question.

We are dealing today with a growing recognition, simply by changing weather patterns in the United States, that something is happening. And the SuperStorm Sandy, which ravaged the Northeast, was a pivotal moment in this country, which I think is going to provide an additional push to lawmakers who are on the fence to allow the president that room.

But even if he has that room, the current time schedule is to come to an agreement by 2015 to put new rules into effect by 2020. Those eight years, that gap period, is absolutely critical. And so I agree that the emphasis has to be on what you do here now. And I would just simply add one other piece to that conversation and that is the bilateral agreements that could happen

on things like CFCs, methane and black carbon. If you were simply to be able to use U.S. diplomatic pressure to have a more serious conversation with China and India about how they regulate CFCs, you could make a pretty big dent in the next eight years with respect to global pollutants. And that, I would argue, is maybe where our energy should be.

It is going to be difficult in the foreseeable future to have a president go to these talks, knowing he's going to be able to get 60 to 66 votes to ratify a treaty in the Senate, but I think there will be support to maybe work on some more bilateral targeted initiatives around perhaps black carbon, CFCs and methane.

Ms. Sylke Tempel: Thank you. Ladies and gentlemen, I'm sure the panelists are more than happy to take your questions. Yes. The gentleman here. Can we have a mic over here? One, two, three.

Unidentified Male: (Inaudible) London. First question to Fatih and I admire you about your crystal

ball, about predicting a very much important role of shale gas, even in 2009. At that time, not many people pay attention to the shale gas. So with your crystal ball, what next revolution do you expect and with which timeframe? That is my question to you. And my question to Mr. Pascual is, I very much agree with you that, you know, we should not just wait for the completion of the U.N. demonstration so we should make ourselves always available (inaudible) initiatives or something like that. And, yesterday, Mr. Zoellick presented very much a debate about, you know, a lot of them engage in international negotiation with 190 parties. It might be more useful to discuss among 20 or less than 20, (inaudible) that kind of, you know, the new international governors or international institutions might be worth considering. And you also said that, you know, the geopolitics of energy scene is completely changing at a (inaudible) emerging economy is increasing. So what do you see the role of IEA as a body for international energy security? What is the

role of the IEA in the changing energy circumstances in the coming decades?

Ms. Sylke Tempel: That's a mean tactic. We take up this question right away. Fatih, would you like to answer the question of the crystal ball, and then Carlos, you answer the question on the IEA?

Dr. Fatih Birol: Now I think the, Mr. Ima is right. In 2008, in (inaudible) focus that the silent revolution in the North America will start. And now what we see is that this silent revolution became loud and beyond the United States. Now, of course, it is not easy to make such predictions all the time, but if I have to bet on something, I wouldn't be surprised if the next step would be on this time on the demand side, namely natural gases used more and more for transportation purposes.

Today, more than 98 percent of the cars in the world are run by petroleum products and most of the trucks and buses and so on. And if the price levels in the United States stays at this level or a bit higher

than this, it provides a very good competitive edge, vis a vis petroleum products such as gasoline and diesel, and we may see more and more use of natural gas in the transportation sector, which could be very important in terms of addressing the oil security and oil prices issues.

If I have to pick up something, I would put a bet on this. Gas in the transportation sector.

Ms. Sylke Tempel: Thank you. Carlos, would you?

The Hon. Carlos Pascual: In terms of the IEA, it's been an absolutely critical organization. It's going to continue to be so. Just a comment on your comment before you asked the question about the IEA. There are smaller groups, organizations or smaller bodies that are meeting right now in groups of about 20 to 25. The major economy's forum is an example of that. The Bush Administration had a similar type of body, which this continued and built on. There's a recognition that if you get some of the principle economies together that are responsible for the CO_2 emissions, that there's an

opportunity there to actually be able to work through some issues and come up with some practical solutions, particularly on this point of how do you put action on the board that results in constructive ways of bringing emissions down?

Regarding the IEA, one of the things that I would just underscore is that we're going through an energy world right now that has some massive revolutions. Revolutions in technology. We're going to need revolutions in finance, as well. We've had revolutions that affected the oil sector. It affected the gas sector.

There are questions that we need to ask about what is the structure of this global gas market going to look like. We've already seen massive changes here in the European sphere where you've had an increased use of LNG, investments in LNG infrastructure, connecting pipelines, reversed inter-connectors between countries, the ability to have reverse flow so that it's not just

going east to west, but west to east. You have the anti-monopoly policies, third-party access guarantees.

How do you take all of these lessons and begin to apply them to the kind of global market so that when the BPs and the Exxon Mobiles and the Chevrons and the others are engaging in that environment, as well as the state companies, they're operating an environment that is more competitive and is going to create deeper markets, not just shallow hubs. And it's going to bring the kind of positive advantage the two of you were talking about that we've already seen in the European marketplace.

These are the kinds of things where we really need leadership and analysis and thought. The IEA has consistently been the leadership organization in doing that kind of work and I would venture to say that the area of the world where a lot of that work needs to be applied right now is in Asia because it is the fastest growing market for energy, particularly for gas. We need a better understanding of how to work in that

market in a way that makes it competitive and transparent so that it's good for both consumers and suppliers.

Ms. Sylke Tempel: Thanks. Now, for the 10 minutes we have left, I have seven questions. If you talk a bit faster and ask a bit quicker, you know, we can squeeze them all in. We start with the gentleman in the first row, go to the lady in the second row, and then the lady in the third row. I have you, but then I have to go here and then I have to go here.

Mr. Peter Vis: Hello. Okay. My name is Peter Vis. I work in the European Commission for Connie Hedegaard, the Climate Change Commissioner.

We're hearing all about the energy revolution. Lots of this fossil fuel energy is being found in the U.S. and what you don’t need you export to Europe in terms of coal. Someone mentioned China, too, had a big potential. (Technical difficulty) So we're getting in a sort of--we're going into the phase where we won't be having wars for energy, but we're going to be having

perhaps wars for climate fragility, water scarcity. These are the things which might be just as destabilizing. And we obviously need U.S. leadership on the climate change front. You know, can we count on getting that soon? Thank you.

Ms. Sylke Tempel: Thanks. Can you pass the microphone to the right? Exactly.

Ms. Niki Tzavela: Well, it's good I'm following the gentleman because my name is Niki Tzavela. I was at a (inaudible) and also the (inaudible) on the Energy Roadmap 2050 for the European Parliament. And I have to inform all of you I gave the biggest fight in my life to come out with a tax to sell gas that was a little bit reasonable and coherent. I had to be faced with the most unreasonable, dogmatic, extreme positions of the majority of the European Parliament that they didn’t care about the competitiveness of the European industry. They didn’t care about the wellbeing of the European citizens. In the Roadmap 2050, I was pushed and pressed not to use the word “natural gas,” but to

use the word “conventional gas” so that the Roadmap 2050 of the European Parliament would exclude the unconventional gas, which is shale gas. So ladies and gentlemen, we have a problem in Europe.

Ms. Sylke Tempel: Is there a question you would like to ask the panel?

Ms. Niki Tzavela: No. I would just wanted to inform you--

Ms. Sylke Tempel: Because we have so many more questions here.

Ms. Niki Tzavela: Yes. It's not a question, but I wanted you to know the environment we make legislation in the European Parliament. Thank you.

Ms. Sylke Tempel: Thank you. Yeah, pass it. Pass it. Thank you.

Ms. Katinka Barysch: Thank you. Katinka Barysch from the CER in London. Can I play the crystal ball back to Iain Conn? You were quite cautious in your outlook about shale gas within the European Union. What about Turkey? What about Ukraine? What, perhaps, about

Russia itself? Is it going to jump on the bandwagon? And Carlos Pascual, you talked about a global gas market. Well, help me out here, please. If we all start developing our own shale gas resources, aren't we looking at more local and regional market, a bit more like coal than oil? And if this is so, what are the implications of this?

Ms. Sylke Tempel: Thank you. Would you like to take the first ones, Senator Murphy? Your take on the U.S. leadership in climate change.

The Hon. Christopher S. Murphy: Yeah. Let me take it very quickly and simply to say this. I think you got all the message that you needed about the United States' commitment to leading this conversation with the selection of John Kerry as the next Secretary of State. Obviously, he was the hero of the United States Senate on this issue, attended almost every major international conference and negotiation. And the combination of the President of the United States using a very short and normally policy-bereft inaugural

address to talk about the imperative climate change and then the selection of John Kerry, I think, tells you that, notwithstanding, an issue that we will eventually have on treaty ratification that I would argue will be shifting in the right way as the signs increases and become more incontrovertible. You clearly are going to see, I think, this be a seminal international effort for this president and the Secretary of State.

Ms. Sylke Tempel: Thank you. Iain, (inaudible) crystal ball again.

Mr. Iain Conn: Well, firstly, I should just add one thing about my earlier comments, which is BP is still a carbon company. And I just want to make that very clear. We produce carbon and the world will be dependent upon carbon 80 percent in 2030, in our view.

But what we are determined to do, just like other companies in our industry, is to do it responsibly. To Katinka's question, I mean, I think that shale actually is not new. It occurs in geography where you've got coal and not very well formed reservoirs for

hydrocarbons. It's actually quite ubiquitous around the world and we know where most of it is. I think the unfortunate thing for Europe is the number of basins and you mentioned some of them: the Polish Basin, the Austrian Basin, Ukraine. Yes, there will be shale discoveries and we will add shale to Europe's energy mix and we should.

I think the point that you make about local is very important. It costs $4 a barrel to move a barrel of oil around the world from just about anywhere to anywhere else. It costs $45 a barrel to move the same amount of energy as gas. So if we can, the world is going to go to local gas. And the biggest revolution that could happen is if China finds large quantities of shale gas. China has the second largest rig fleet in the world and it may well have a lot of shale gas and so may Russia.

And I think what we are looking at is a world that is going to go to more local gas and a lot of it. And this will provide a really important bridge while we

develop the technologies and efficiencies necessary to replace fossil fuel. So I agree with your assertion.

Ms. Sylke Tempel: Carlos, the question on the global gas market or would you rather be local gas markets?

The Hon. Carlos Pascual: Well, the majority of the gas that's actually being found around the world right now is not from shale. It's actually conventional gas. And when we look--we haven't even talked about Russia, but Russia has indicated that its plans are to increase its production from about 670 billion cubic meters to a trillion cubic meters by 2030. It's massive in comparison to everything else. And then on top of that, add for the possibility of shale.

And so that’s one piece of the equation. The quantities that are coming into the market are quite, quite significant. The other piece of it is that, increasingly, gas is being traded as LNG. There's a point in time when, in effect, we had a pipeline world where you had de facto monopoly between the supplier on

the one side and the consumer on the other side and no part of the world knew that story better than Europe. And that doesn't exist today in the European environment because you've increased your consumption of LNG by about threefold, from about 25 BCM about 10 years ago to somewhere around 75 BCM today.

And as a result of that, it's put Europe in a position where your utilities are renegotiating right now and have been renegotiating over the past several years their contracts with gas prime to lower the price and increase the financing terms. So it's had already quite a massive impact.

The final thing I just wanted to say on the environmental side is that the issues related to shale gas development are significant. We have to talk about them. We have to be open about them and that’s what we've been trying to do in the United States and with international partners. We have a program in the United States where we've been working with countries such as Poland and Ukraine and a number of others in Europe and

Jordan and China, in Chile and Columbia, in South America. And what we're trying to do is share the best practices that we've learned about, in terms of what happens with potential methane gas emissions, how to deal with water, water scarcity, fracking fluids that are being used, how to deal with the treatment of those fluids when they come up, what the potential seismic impact could be. And you have to be clear about these things.

One of the things that we've learned about our own experience is having a dialogue with communities from the outset about what the risks are, how you manage those risks and deal with them in a way that you get positive environmental outcomes and deal with those potential leakage issues in a way that gives you a positive emissions reductions as a result of the production of gas. These are absolutely key and have been central to the way that we've been trying to work on these issues globally.

Ms. Sylke Tempel: Thank you. One question. Do we have time for one more question? We do. In chronological order, there was one question over here. Just one.

Mr. Paul Applegarth: I'm the one person. I'm Paul Applegarth with Value Enhancement International and my question is really for Senator Murphy. I'm wondering, Senator, if you're not misreading somewhat the opposition to government involvement in the market to eliminate only to climate change skeptics. And is it perhaps, no pun intended, energized by the sort of cynicism about the history of government involvement so far, other than the environmental regulations, including the corn ethanol mandate, which essentially consumes more energy than it produces and has driven up the cost of food, both corn and animal feed, the Solyndra incident, where essentially campaign contributors to the president received a $500 million financing, which was written off, oil subsidies, which I do think most people believe could go away now and

are still around and a belief that once the government gets involved, it's hard to get rid of things.

Ms. Sylke Tempel: So your question is?

Mr. Paul Applegarth: And in fact, much of the shift from coal to gas has happened without government intervention. That was one question. I wish you would comment.

The Hon. Christopher S. Murphy: And the short answer is you're right. I am oversimplifying it when I say that the issue is simply about climate deniers. I think that is the majority of the issue. I think it's become essentially a rite of passage in one party to essentially stay off the playing field on this topic, but you're very right. There are many on my side of the aisle who are not going to vote for a major climate bill because of geographical concerns because of an old economy connection to coal or to other resources.

And there is, you know, that skepticism of the government coming in and playing a bigger role in the marketplace. My argument is just that we already are

today. We are incentivizing renewal energy production. We're just doing it in a really dumb way. We're not picking winners and losers with subsidy policy and with tax incentive policy. And so there's just a much better and cleaner way to do it if you were to simply set a new market.

And I think that speaks to the issue of energy efficiency. I think we may actually get an energy efficiency bill in the next two years. There is definite bipartisan agreement on the issue of building standards, for instance. But the better way to do that is to simply set a cap on carbon emissions and allow for the energy distributors to decide whether or not they gain those savings from investing in things like nuclear or renewable energy or whether they go out and do a program of energy efficiency with their consumers.

The reason you haven't seen that investment in renewable energy is we still have a marketplace that just incentivizes more energy being produced and more energy being distributed. So I think you're right. I

think there is a much more complex set of reasons that go into the skepticism of that, a greater insertion of the government into the energy marketplace. My contention is that we already have a firm foot in this marketplace right now. We just do it with subsidies and tax policy. It would be much smarter to do it in a market-based way.

Ms. Sylke Tempel: Thank you very much. Well, the bad news is we really have to end this exciting conversation here. And I'm very sorry we can't take more questions. The good news, however, is that we are totally back on schedule. Thank you very much, dear panel. Thank you very much for your questions.

Mr. Craig Kennedy: And thank you. That was a terrific session. Up in the café, we have the artist who's done those beautiful, beautiful photographs. Make sure you go up there. He'll be there to talk to you. And we'll see you back in about 20 minutes. Thank you.