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Securing the Future
GLOBAL ENERGY OUTLOOK: THE QUEST FOR STABILITY
Panel Discussion

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Moderator:

Daniel Yergin, Executive Vice-President, Chairman, IHS Cambridge Energy Research Associates Inc (CERA)

Panelists:

Vladimir Drebentsov, Vice-President for External Affairs, BP Russia; Chief Economist for Russia and CIS, BP Group

Maria van der Hoeven, Executive Director, International Energy Agency

Alexander Novak, Minister of Energy of the Russian Federation

Igor Sechin, President, Chairman of the Management Board, Rosneft Oil Company

Peter Voser, Chief Executive Officer, Royal Dutch Shell plc.

D. Yergin:

Ladies and gentlemen, we would like to welcome you all to the Global Energy Outlook. This session is one of the main parts of the St. Petersburg International Economic Forum. It gives us the opportunity to look at where we are and where we will be going in the future. I am very glad to have you all join us. I know we are getting started a little late and I want to thank you all for your patience.

It is a privilege for me to be able to chair this session with this distinguished panel and I am very much looking forward to the discussion. In a sense, the themes have always revolved around the question of stability and instability in the energy markets and how they are going to change. Some of the underlying themes for today's questions include the impact of emerging markets; changing demand and growth, and what that means particularly for dynamism; technology – just as the film you were all watching talks about some of the major technological innovations that are changing the supply outlook today; and of course geopolitics is part of the energy market, as always. We can see this unfolding today and over the past weeks in terms of the contention surrounding Iran's nuclear programme, and the response to it. How this will unfold is an important factor in the energy market and global economics, as we see the downturn in the European economy affecting energy markets. So, the discussions that we are going to have included major questions regarding stability. Can we expect it? Underlying that question is the issue of investment and ensuring the level of investment that a growing world requires. We have a distinguished panel, and to begin with, I would like to welcome Igor Sechin, President and Chairman of the Management Committee of Rosneft, who will really set the scene for our discussion today. Igor Sechin.

I. Sechin

Ladies and gentlemen, this is the fourth time we have gathered for this Forum. Today, I would like to welcome you on behalf of Rosneft, Russia's largest oil company and a global leader in oil production among public oil and gas companies. The St. Petersburg International Economic Forum has always been a platform for

building bridges and establishing partnerships between major energy corporations, the Russian Government, and investors. To reach our goals, we have consistently worked toward building strategic alliances, implementing new projects, and developing new technologies; today, we can happily announce that we have succeeded. I would like to note that our company has been vested with a great responsibility: we are the Russian Federation's number-one taxpayer. We have the responsibility of ensuring an uninterrupted supply of oil to the domestic market. And now, the government has tasked us with supporting offshore development projects in cooperation with Gazprom. Despite the fact that the state owns 75% of Rosneft, we never forget our responsibility to our investors. Few people stop to think that the global community still considers Rosneft's IPO a few years ago to have been a success that put more money into Russia's budget than all other privatization efforts in the oil sector combined. We have fulfilled all the obligations placed on us at the time of the IPO, and we continue to create value for investors and carry out the mandate vested in us by the president of the Russian Federation. For example, we have submitted a proposal to the government to increase dividends to 25% of net earnings in accordance with the IFRS.

We also have a sense of responsibility for the future of Russia's oil and gas industry, with an eye to our population's financial prosperity. The industry is facing serious challenges related primarily to the deteriorating structure of the existing resource base. Meanwhile, 50% of Russia's budget essentially comes from oil and gas revenue. We understand these challenges. A few years ago, we began developing one of the largest new oil fields in Russia, or indeed in the world, Vankor Field, with confirmed reserves currently at 500 million tonnes of oil and over 1 billion tonnes of mineral resources. Today, Vankor Field is already operating at full capacity.

In 2011, we unveiled new, large-scale projects focused on medium- and long-term replacement of retired production, specifically the development of the Russian Arctic shelf and the extraction of difficult-to-access hydrocarbon reserves. We expect that by 2020, 5% of our output will be coming from the new regions.

By 2030, the new oil deposits will account for 40% of the country's oil production: a giant leap forward on a scale unseen since the development of the oil-rich West Siberian Plain in the 1960s. To increase our resource base, the company has begun to implement a programme of unprecedented scale to develop the Russian Arctic shelf: the most difficult and promising source of future production.

Rosneft is the shelf's largest offshore producer. It holds licenses to 29 of the shelf's plots, with total recoverable resources of 26 billion tonnes of oil equivalent. Today, we are developing the shelf in partnership with the best multinational companies, which are providing the necessary technologies and expertise: ExxonMobil, Statoil, and Eni. The mutual exchange of assets and technological cooperation contribute to a stable, reliable partnership.

Today, right here at the Forum, we will be signing two full-scale agreements with Eni to explore several blocks of Russia's Arctic shelf, as well as an agreement with Statoil to conduct joint exploration and development of the Norwegian shelf.

We are open to the continuation and expansion of cooperation with multinational companies. We believe this cooperation will have a direct impact on further growth in Russia's oil and gas production, primarily offshore production.

Industrial development of new regions, including offshore development, will take years, even decades. But while we, in conjunction with our partners, are laying the foundations for this future work, we are already working to extend efficient production at our company's old extraction sites. Hard-to-get oil is a potential source for increased production of sweet crude oil at sites with existing infrastructure. The majority of deposits and resources located on the West Siberian Plain are concentrated in the Achimovsk, Bazhenov, and Tyumen Formations. The total volume of difficult-access deposits and resources in all the licensed plots owned by our company alone is evaluated at 800 million tonnes: 13% of the company's total production.

The open acreage on our company's licensed plots contains another 400 million tonnes. These reserves can potentially produce more than 15 million tonnes a year. It is important to know that these projects could reach the extraction phase within

two to three years, and reach full capacity in the medium term. The technical study of low-permeability reservoirs in Rosneft's West Siberian plots is another important element of our collaboration with ExxonMobil. The initial joint technological study of these reservoirs will include the construction of state-of-the-art wells. In the future, we will be able to implement even more sweeping projects aimed at full-capacity extraction of these deposits.

Today, we will be signing an agreement with Statoil to develop Rosneft's West Siberian and North Caucasian low-permeability reservoirs, which contain approximately 150 million tonnes of hard-to-get deposits. This is our answer to the challenges connected with the deteriorating reserve structure. This work has tremendous potential. I must note that these projects were made possible primarily by the efforts of the Russian Government to create tax breaks for offshore extraction, as well as for the extraction of deposits which are difficult to access. These measures have cardinally changed the taxation framework for these projects as compared to oil extraction in traditional regions by nullifying the export tax, establishing differentiated *ad valorem* tax rates for extraction of natural resources, accelerating amortization schedules, and providing other significant benefits. These measures undoubtedly require legislative approval. We are actively working with the government to create a fair, stable tax system. All these measures are acting to create a solid economic basis for our joint investments.

This slide compares Russia's tax rates for offshore extraction with the fiscal structure of major oil-producing countries. We can see that tax exemptions established by the new legislation ensure the high investment appeal of survey works and offshore development. Also, we are not allowing ourselves to grow complacent in the sphere of oil refining. Although Russian oil refineries lag behind the global average in depth, Rosneft is working on a large-scale programme to modernize oil refining capacities, which will allow us to fundamentally reform the oil refining sector.

The production of the company's existing oil refineries will increase by 18%. The company's Russia-based refineries alone will produce almost 58 million tonnes a

year, while petrol production will increase by over 70%, bypassing 10 million tonnes. The production of light petroleum products will increase by up to 76%, and all engine fuels will comply with Euro 5 of the European Emission Standards. To achieve these results in the next few years, we must renovate or construct from the ground up more than 47 large facilities with a combined refining capacity of 58 million tonnes, while a total of 122 oil refineries will be renovated in Russia in the next few years. We are working on these sweeping projects in close cooperation with multinational companies including ABB, General Electric, WOP, Teknik, Siemens, ExxonMobil, and others. Today we are turning our intentions into specific agreements, and then continuing on to full-scale implementation of these projects. To explore and develop offshore and hard-to-get resources, Rosneft will require hundreds of billions of dollars in investments. In addition to investment in oil extraction, we must invest considerable funds in modernization, creation of an energy delivery infrastructure, and oil refining and petrochemical capacities. That will also require tens of billions of dollars. We are interested in expanding cooperation with investors and technology partners, and right now, we have a real window of opportunity for global collaboration.

At the same time, our industry is highly volatile, and not all decisions depend on markets, consumers, and suppliers. Too often, they are conditioned on serious political factors; regulators' liability is very high. I urge politicians, companies, and financial institutions to foster closer cooperation: after all, we are all greatly responsible for providing a stable energy supply. Otherwise, we will be forced to deal not with the energy industry, but with agricultural security. Thank you very much for your attention.

D. Yergin:

Thank you, Mr. Sechin. I have one question before I turn to our other discussants. You naturally talked about the importance of the oil and gas industry to the Russian economy in terms of budgets, and you also talked about technology. How do you see the development of the Russian oil and gas industry in terms of technology

contributing to overall technological advances and the modernization of Russia beyond the industry itself?

I. Sechin

Mr. Yergin, in brief, Russia's energy industry can be, is, and must remain the driving force behind the country's modernization. I mentioned earlier that in the next few years, we will need to construct or modernize 122 large facilities in the oil refinery sector alone. In the electric energy sector, we must add new generating capacities in the region of 96 gigawatts. The same colossal number of grids will need to be modernized. Therefore, our energy companies have already made corresponding changes to their investment programmes. The projects we are discussing today are already being implemented, ensuring the continuous growth necessary not only for our energy sector, but for the economy as a whole. The programmes I have mentioned are not just castles in the air: they are being implemented as we speak, and I assure you that everything I have talked about will definitely be accomplished.

D. Yergin:

Thank you very much. Most of you know this, but for those who do not, the International Energy Agency was established in 1975. It is the association of the major energy-consuming countries around the world, and some have described it as the 'energy conscience of the world'. Its Executive Director is Maria van der Hoeven, the former Economics Minister of the Netherlands. Recently, the International Energy Agency has come out with a vision which they call the 'Golden Age of Gas'. This is a country, Russia, which produces a lot of gas. Executive Director van der Hoeven, could you give us a sense of what the golden age of gas is?

M. van der Hoeven:

Well, what is the golden age of gas? Let us be honest. It is a scenario, a scenario in which the share of gas in the global primary energy mix is rapidly growing, in which

unconventional sources complement conventional ones. And it is a scenario which sees gas demand increasing to 25% of the global energy mix in 2035, up from 22% in our baseline year policy scenario. It also passes coal by 2030 to become the second fuel after oil. The higher level of penetration of natural gas in the wider energy mix derives from lower prices, higher use of gas in China, and the widespread development of unconventional sources and demand. This is very important, because demand does not only arise in the power sector, but in industry as well.

Since gas is growing more rapidly than overall energy demands, the world will need a lot of gas going forward, particularly to meet the growth in electricity demand in the emerging economies. This emerging importance of unconventional gas does not mean that conventional gas and large-scale gas infrastructure is now redundant.

Russia remains the largest producer and exporter in the golden age of gas scenario. Large investments are made in Russia, both in new super giants, as well as LNG and East Siberian pipelines. Indeed, in many ways the dramatic increase in the availability of unconventional gas and LNG supplies will open up opportunities for massive increases in the export of conventional gas as industries and consumers shift consumption, displacing higher-priced alternatives. Gas will also become the marginal fuel of choice for emerging economies, especially for power. With its pre-eminence in global gas reserves, Russia will be very well poised to increase its gas exports substantially. Increased global energy trade coupled with unconventional gas will also accelerate the conversion of current regional gas markets into a more global gas market, which will expand markets around the world for major exporters like Russia to supply. Russia also has the advantage of having the world's largest existing and expanding pipeline links to major markets like Europe and Asia, and potential for massive expansion of energy exports. It is not hard then to envision Russia continuing its role as the 'Saudi Arabia of gas'.

Energy from conventional Middle Eastern gas will also increase significantly. Global energy trade increased by around one third between 2009 and 2011, and the first

energy wave largely driven by Qatar is now completed. A new wave will come from Australia in the middle of the decade.

The United States will remain largely disconnected from the world in terms of trade and prices, but the prospect of energy exports from North America is not far off. In the next decade, in our golden age of gas scenario, we foresee significant growth in Russian energy on the basis of Arctic and Eastern Siberian resources. There will also be competition for these new sources of LNG supply. Asia will remain the leading importer of energy. Of course, this includes Japan and Korea – they are the historical importers – but it also includes China and India. Many other countries are looking at importing LNG. Thailand just started and Malaysia, Vietnam, Indonesia, and Singapore will join soon.

So, demand and supply of both conventional and unconventional gas will rise, but nevertheless, unconventional sources are rapidly gaining importance in our golden age. In only a few years, new technologies such as hydraulic fracturing have transformed the gas sector, unlocking regionally dispersed natural gas reserves equal to around 250 years at current production.

Increasing access to gas reserves is expected to lead to substantial growth and demand, making natural gas the single biggest contributor to the growth of energy supply in the next 25 years. Realizing this potential will, however, require substantial new investments: investments in production, in transport, and in distribution. We estimate USD 9.5 trillion by 2035, and more than half of that sum will be to supply non-OECD markets. Realizing the initial tranche of these investments will be a considerable challenge in the current financial environment and remarkably the US shale gas revolution has occurred concurrently with the global economic crisis, creating intense competition and record-low US gas prices.

Cheap gas, both conventional and unconventional, increasingly drives out coal from power generation, and that leads to CO₂ emission reductions that would have seemed practically impossible a few years ago.

This is welcome but not enough. In our view, gas is a useful transition fuel and is currently yielding a significant drop in CO₂ levels in North America. But, let us be

honest, gas alone does not provide a sustainable energy system; it is no panacea. It provides a bridge to a lower carbon future as low-carbon technologies are deployed and gain in competitiveness. The implications of the unconventional revolution will continue to be felt around the world. Energy producers who had counted on US import demand scrambled for alternative markets, principally among the developing countries in the Asia-Pacific region where gas demand continues to grow. The tightness of Asian LNG markets, even without the impact of Fukushima, is a reminder of how rapidly economic growth in a major region can absorb supplies, and these developments are reflected in significant regional price spreads. In the US, prices are currently around one seventh of those paid in Asia. Regional price divergence is likely to influence patterns of trade and investments into the midterm. The key determinant will be whether US industry can maintain the rate of growth we have seen in recent years. Much will depend on its ability to grow domestic gas markets and to export energy internationally. Continued use of all indexation would come under intense pressure as increasing volumes of cheaper US gas reach international markets. It is not only shale gas itself which is likely to spread from North America, but also shale gas technology. Several countries which are import dependent have recognized their non-conventional gas potential, and promising developments are taking place in China and Poland. Nevertheless, transplanting this American gas revolution will require expertise and technology. Public support will also be crucial.

Hydraulic fracturing has generated considerable controversy, and we believe that if you have good management and good regulation – and these factors are essential – shale gas can be produced in a safe and environmentally sound fashion. That is why a special world energy outlook report may be released examining golden rules for non-conventional gas to herald a golden age. There will be no golden age without golden rules.

Uncertainty around long-term prices will raise new challenges for securing the necessary investments. Natural gas prices and revenue streams will need to reflect the capital-intensive nature of the natural gas supply chain, while also remaining

competitive. Creating a more competitive market and a more effective market will be crucial in attracting the investments needed to secure long-term natural gas supplies. Stable and transparent regulatory regimes will be crucial to increase natural gas supply and global natural gas security. Earlier this month, we released our annual medium-term gas review in Kuala Lumpur. It focuses on the competitiveness of natural gas in the power sector, on shale gas developments in China, and the availability of US energy on world markets. To sum it up in one sentence: if we really want to have a golden age of gas, we have to see to it that we exploit gas according to golden rules. Otherwise, public opinion will be against it.

D. Yergin:

You have painted a very compelling and realistic picture of the expanding role of gases over the next two decades. Let me now turn to the other concern that you have, which is of course in the topic here – short-term stability or instability in the oil market. Three months ago we might have had a very different expectation for the oil market than what we have today. Very simply and in a few sentences, do you see a stable or unstable oil market right now?

M. van der Hoeven:

Well, the oil market is better supplied than it was three months ago. That is one thing. The other thing is that we can see prices going down. We should, however, not forget that these prices are still at a historically high level, and they have been so for quite a long time. We cannot be complacent about the situation as it is, especially not in these times of slow economic recovery. We can see that all countries are affected by these prices; emerging countries as well as mature economies.

The OPEC meeting was held last week and I was happy with the outcome because it showed that there is still the wish to meet the demand of customers, and this is very important. Over the past few months, OPEC's supply to the market has been higher than before. In that way, it ensured that there was not a problem and it better

supplied the market. My last remark would be on non-OPEC countries like Russia. They have been very helpful by producing more – it was about 200,000 barrels a day more – and this has helped to create a better supplied market.

D. Yergin:

Thank you. By the way, the Executive Director spoke about changing market share. We are going to have some very interesting voting at the end of this session to see where you in the audience stand in terms of future scenarios. Let me now turn to Alexander Novak who is the Minister of Energy of the Russian Federation, formerly Deputy Finance Minister. Minister Novak, could you share with us some of your thoughts on the gas markets, infrastructure, and questions of integration?

A. Novak:

Thank you. Good afternoon, esteemed colleagues.

I would like to begin by saying that it is a great honour for me to speak at this event dedicated to the growth of the Russian Federation's energy industry and a discussion of global trends.

The role of the Russian Federation in the global energy industry cannot be overstated. We all know that Russia produces more than ten million of the world's 83 million barrels of oil a day: a significant share. This is in addition to production of natural gas as a source of energy. This is why today, the topic of the global changes taking place across the world and their impact on Russia's oil and natural gas sector is undoubtedly a very important subject of discussion.

First of all, I would like to say that in my opinion, we should have forecasts for the next 15–20 years, since forecasts for the more distant future are not very effective. Technology is currently developing so quickly that we cannot predict what will happen 20–30 years from now. I imagine that current corporate investment plans are taking the growth outlook for the next 20 years into account. I believe Ms. Maria van der Hoeven has spoken in great detail about the natural gas market and its expected developments and current trends. For my part, I also want to stress that

natural gas is currently a defining factor and one of the most important strategic vectors in the development of the global energy industry. In the next few years, our prospects will depend on innovative technologies in the natural gas sector, and on new delivery systems and related technologies for their implementation, as well as on the speed with which the largest target markets can be equipped with natural gas supply grids. We have all noted the serious changes that have taken place in each of these sectors over the last decade.

In the US, for example, we have seen that between 2006 and 2011, the total volume of domestic natural gas production increased from 506 to 582 billion cubic metres, the share of shale gas increased significantly, and wholesale natural gas market prices were considerably lower than the prices on other consumer markets. Therefore, the United States market will play a crucial role. Many experts estimate that by 2030 the US, Mexico, and Canada will eradicate oil- and natural gas-based energy dependence.

The second item I would like to discuss in this regard is global liquefied natural gas (LNG) infrastructure capacities. While in 2010 global LNG production was 310 billion cubic metres of natural gas, by 2020 capacities are expected to grow to 400 billion cubic metres. All this will have a significant impact on the market. We have already spoken today about the new delivery systems expected to be implemented, including the liquefied gas pipeline delivery system, although these plans must be carefully studied and evaluated.

An important factor that was mentioned earlier is natural gas consumption and the development of natural gas supply grids within the world's largest markets, such as China. We know that China currently consumes approximately 150 billion cubic metres of natural gas. Experts estimate that by 2020, China's consumption will increase to 350 billion cubic metres, which is to say, more than twofold. This will have a significant effect on the natural gas market.

Armed with our understanding of the specific nature of Russia's natural gas sector, we must be ready to meet these challenges and sharpen our competitive edge in the natural gas industry. Today, Russia undoubtedly has a significant edge in,

among other things, the cost of natural gas production, the size of natural gas reserves, and the presence of an extensive pipeline infrastructure, built partly in the Soviet era and partly more recently. At the same time, considering global changes, at some point we must take a close look at modernizing the natural gas sector, as this will be the key issue for the next few years and will be reflected in the strategies of virtually every multinational company.

Mr. Yergin, now that I have answered your question, I would like to mention a few other points. For example, I would like to say a few words about the energy infrastructure. Today, the factors of growing energy consumption, the development of new deposits from the ground up, the development of new supply technologies, increased performance, and environmental requirements are leading us to consider the unprecedented demand for infrastructure development. We often forget to account for this factor, but we must realize that in the near future, funds will be actively invested in infrastructure around the world. Russia will provide a shining example in this regard. Experts estimate that by 2020, investments in the infrastructure of Russia's oil, natural gas, and electricity sectors will reach USD 1 trillion. At the same time, as Igor mentioned in his remarks, we will be actively developing offshore facilities. Forecasts show that by 2030, offshore production will constitute 25%–30% of total oil production. Still ahead are the sweeping development of Siberia and the Far East and the radical modernization of power grids. As mentioned at a roundtable discussion earlier today, this will involve the construction of more than 250,000 kilometres of power lines. The construction of new generating capacities, coming primarily from natural gas and coal, will continue, with a special eye to the specifics of the Russian market.

I have already mentioned overall investment expenditures, but rather than simply giving the numbers, I would like to say that this will be an immense resource: more than USD 100 billion will be invested in the infrastructure every year. We must use these funds with great care; they must work hard for our economy. We must implement completely new technologies, carry out scientific research, and actively implement energy-efficient technologies; we must have a competitive edge in this

respect. The USD 1 trillion that will be invested by 2020 must reflect on the competitive edge of our entire country, of all our energy companies working in this sector. I would ask all those present here today to think about this and to work with the Ministry of Energy on this issue.

Lastly, I would like to talk about global integration. We all realize that in 2011–2012, we crossed the Rubicon in integrating Russia into global markets and bringing foreign companies into Russia: we have already signed agreements with ExxonMobil, and today we will be signing agreements with Statoil and Eni. All this is happening simultaneously with comprehensive global integration and the emergence of new major players. In Brazil, for example, Petrobras has already established itself as a leader in deep-water extraction. We have truly sweeping investments and prospects in the sphere of offshore oil and natural gas extraction. In addition, I would like to mention the Chinese oil companies that actively invest in Central Asia and Africa, as well as global oilfield services companies, with their newly developed energy delivery technologies. This is why I believe our Russian companies have implemented an excellent strategy by joining the global integration process. I believe we could achieve interesting results by accelerating this work and defining certain methods for cooperation in the interests of global integration.

I think the three factors I have mentioned will serve as catalysts for changes in the global energy infrastructure, and will be required to balance the interests of producers with those of consumers. Thank you.

D. Yergin:

Thank you very much Mr. Novak, I think Mr. Sechin wants to add a comment here.

I. Sechin

Thank you very much, Mr. Yergin. I would like to agree with Ms. Maria van der Hoeven's statement that the golden era of natural gas must be built on golden rules. These golden rules must be based on transparency of the decision-making process, because we are talking about millions, tens of millions of consumers. Without the

ability to participate in a public discussion of these decisions, these consumers may be forced to pay for surplus delivery capacities, say. We can assume that these surplus capacities might arise as a result of decisions to build LNG pipelines. We can also assume that the price of shale gas currently does not include expenses related to the liquidation of wells or reclamation of the territory. We must inform our consumers of this fact. They must take part in this discussion to make sure that we do not see a repeat of what happened with nuclear energy at a certain stage, when it was referred to as the cleanest and cheapest energy that would allow us to maintain an ecological balance without any risks, with no mention of the fact that eventually we would have to liquidate nuclear stations or recycle fuel, thereby making nuclear energy one of the most expensive resources. Those are my two cents' worth, but I wish all of you the best of luck in this endeavour.

Thank you.

D. Yergin:

I will allow you to make one quick comment before handing over to our other speakers.

M. van der Hoeven:

It will be a very short comment. Mr. Sechin is right. Without golden rules it will be very difficult, maybe impossible, to successfully explore for shale gas. But these golden rules do not only apply to unconventional gas. They also apply to the exploration of gas in challenging environments such as deep sea and arctic environments. And we need to see to it that we involve the public so it does not only go for unconventional gas, but for conventional gas as well.

D. Yergin:

Our next speaker is John Watson, who is the Chairman and CEO of Chevron, one of the super-majors. John is one of the leaders of the global energy community. John, I was going to ask you to respond and to comment on how, from your point of

view, the international industry looks at Russia today, and also how it looks at issues involving trade, including the WTO, which you are very involved in. I would also like to give you the opportunity, if you want, to talk about how you see the golden rules from the viewpoint of a major company that is at the forefront of technology.

J. Watson:

Thank you, Dan. I will make a few comments on those subjects. I suppose I should start with a comment regarding what the Executive Director said on the developing world. Right now we have roughly a billion people in the world that enjoy what you and I might call a high standard of living. We have another six billion people who aspire to the same things that we have. It is going to take a great deal of energy for that dream to be realized. Right now the world consumes the energy equivalent of roughly 250 million barrels of oil a day. To put that in perspective, Russia and Saudi Arabia each produce around 10 million barrels of oil per day. The estimates of the IEA and others are that, going forward, the world will consume roughly 30–40% more energy over the next 20–25 years even with advances in conservation.

Our view is that, in order for us to make that energy possible and allow the world economy to continue growing, we will need affordable energy. That affordable energy is going to be oil, gas, coal, nuclear, and renewables, depending upon their relative economics. All of them will make a contribution and all of them need to make a contribution in a fairly sustainable way. This is what the public is demanding today.

My view is that, in order for that to happen, we are going to need great partnerships between the public and private sector. I would start by saying that the private sector can deliver great things in the energy field. The innovation that we have seen applied in delivering the shale gas opportunity could not really have been imagined 10 years ago. That kind of innovation and technological advancement applies equally to other types of energy. We are, for example, seeing great advancements in deep-water technology, arctic technology, and in recovering heavy oil from the

world's resources. There are many changes taking place in technology and the private sector has been instrumental in delivering that. Now, there is more than just technology. We also need project management skills, training of national workforces around the world, capital, and a variety of other things in order to deliver the energy that the world is going to need. The private sector can provide many of those things, but they will need to work closely with governments, including the Russian Federation. We see the role of government as providing access, whether it is in Russia or in the United States. We have to make acreage and opportunities available for the private sector. We think that it will be very necessary for host governments to provide the types of fiscal terms and transparency that Mr. Sechin spoke about.

I think that having the collaboration with the right fiscal terms, the right type of access, the right partnerships with national oil companies and other champions for industry in host governments with work that the private sector is doing will give us a very good chance of delivering the energy that the world needs. One of the steps that Russia has taken recently – and it has been a long journey – is accession to the World Trade Organization. We certainly view this as a positive step. Chevron has tirelessly advocated free trade in Russia and elsewhere for many years. Our view is very simple. There is a framework that comes with accession to the World Trade Organization that is positive for Russia, positive for consumers and business elsewhere, and positive in the case of energy for the development of the resources that the Russian Federation has.

My view is very similar to others when it comes to shale gas and technology. We have seen that expectations have grown dramatically around the world. We can talk about how safe shale gas development is, how safe deep water development is, and how safe any form of energy is, but the important thing is that we mitigate the risks that we know are there and deliver that energy in the fashion that we know we can, which is safely and reliably for the consumers of the world. With that, I will just express my optimism in the steps that the Russian Government has taken to

provide the sorts of terms and access that Mr. Sechin referred to earlier. My company certainly looks forward to continued collaboration. Thank you.

D. Yergin:

John, just one quick question. You were Co-chair of the Committee trying to develop on the WTO session. Could you possibly say something about that?

J. Watson:

Chevron and I have spent a great deal of time over the past few years speaking about this subject in the United States. My view is very simple. We produce oil and gas in more than 25 countries around the world. We have also developed closer ties. Closer ties come from cooperation in business. What I have told officials in the American government is that when the American companies have a chance to compete and a chance to participate in the energy system around the world, we will be able to bring jobs, revenue, transparency, and the needed energy supplies to American and other consumers. We think that the integration that was spoken of is very important going forward, and accession to the World Trade Organization is a very logical step. I hope that the US will pass enabling legislation so that companies like mine can fully participate in the WTO benefits that are accorded to businesses doing business with Russia going forward.

D. Yergin:

Thank you, John. I would like to turn to Vladimir Drebentsov who is both the Vice President of BP Russia and the Chief Economist for Russia and the CIS for BP. With those two hats, I would like to ask you three questions. The first one follows from what John Watson was talking about: how do you envision an investment climate that will draw in capital over a long period of time? Secondly, do you have some views from your work on the demand for Russian oil and gas in the global marketplace? And thirdly, what do you expect the impact of the European crisis will be on Russian energy markets?

V. Drebentsov:

Thank you, Daniel.

Before I reply to your three specific questions, I would like to return to the topic of our discussion – ensuring energy market stability – and address the experience and the lessons we learned last year, which proved to be anything but normal. It was a year of huge social upheavals that impacted energy markets: I am talking about the Arab Spring. It was also a year of terrible natural disasters, earthquakes, and a tsunami that severely impacted Japan. These upheavals had significant fallout: for example, loss of oil and natural gas exports from Libya added up to approximately 11% of the European Union's oil consumption. This is a very high percentage. Japan, as we know, lost 30% of its electric energy capacity after it was forced to close its nuclear power plants. However, if we look at the year as a whole, when future historians examine global energy development in 2011 without looking at the fine detail, they will see none of these fluctuations. Last year, global primary energy consumption grew by 2.5%: the same amount as during any of the last ten years. This is nothing out of the ordinary, despite the significant turmoil I mentioned earlier. How did we manage to ensure this stability? I believe the two key phrases (already heard here today) are “growing global energy market integration” and “growing competition between mutually interchangeable fuel types”. If we consider methods by which the global energy industry dealt with the upheavals it encountered, this is the picture we will see: after Japan stopped using nuclear energy to produce electric power, it was forced to greatly increase its natural gas imports. And it succeeded. Both Japan and the global energy industry were able to cope because there were existing natural gas producers who had the capacity to increase exports to Japan. Most importantly, these exporters managed to redirect LNG supplies from other markets to Japan, and those other markets did not even really notice, or rather managed to compensate for this loss.

The world has three natural gas markets: North America, Europe, and Asia. We know how the North American market handled the upheaval: the shale gas

revolution gave North America the most extensive reserves of this resource. But how did Europe weather the storm? Europe weathered the storm by decreasing natural gas consumption. Of course, economic problems were only some of the factors that pushed the European Union to make record cuts to natural gas consumption last year. Natural gas consumption fell by virtually 10% (9.9% by our estimates). This was unprecedented. However, some of these cuts were due to the fact that coal is increasingly providing an alternative source of electric energy. Coal began to replace natural gas, which had proved to be more expensive. Even spot prices on gas went up when Japan's demand increased and LNG bunkers were diverted from Europe to Japan. But the cheap coal that replaced natural gas also had to come from somewhere. On the one hand, of course, the European Union increased its own coal production for the first time in years, but it was forced to increase net imports of energy-grade coal. Where did this coal come from? It came from Columbia and the US. And here we come to the second event, which we and BP's economists consider one of last year's most interesting energy market events: in just one year, the European Union increased its energy-grade coal imports from the US by 38%. This is a serious increase. What made this possible? The fact that in the US, coal energy was replaced by cheaper natural gas energy. The American energy industry's coal consumption was at a record low. As a result, the global energy market managed to balance resource supply channels. The USA was able to replace coal with a cheaper resource, because it is currently undergoing an industrial shale gas revolution.

These are the lessons we must take into account when planning for the next 20 years. We estimate that by 2030, production of all primary energy resources will equalize: in other words, oil, natural gas, and coal will each account for approximately 27%. This is unprecedented in human history. One source of energy has always predominated. This equalization will mean that now, energy markets will be able to substitute one source for another. How is this achieved?

This is precisely the scope of experience that should be examined in Russia. Competition opens new vistas. Let us take North America: the development of

Canada's tar sands and the US's shale gas, and now shale oil, revolution are both possible thanks to technological innovations. And who developed these new technologies? Corporations. Why did this happen in North America, and not in Venezuela, which has larger reserves of tar sands than Canada, and not in China, which, according to geologists, is estimated to have more extensive shale gas deposits than the USA? We believe this is due to the fact that North America has the most competitive investment climate. Companies have access to energy resources, but must compete with each other to develop these resources for the economy. It is this competition that forces companies like Chevron and other global oil production leaders to develop and use new technologies. Other countries facing the same challenge of developing hard-to-get oil and natural gas reserves, such as Russia, should take this experience into account. We have already talked about competition on the natural gas markets, but I think we in Russia must take this into account as well. Russian natural gas could undoubtedly be a competitive commodity. But this will require serious efforts.

D. Yergin:

Thank you. I think that these sessions have set the scene for voting. We are a very democratic group so we are going to vote. The first question is going to be about the energy mix. You can see what the energy mix was in 2011, with oil followed by coal and gas, and now if we can have the questions.

How will it be for oil in 2030, will it be 33% roughly what it is, 28%, or on a worldwide basis will oil be down to 20%? Please vote, everybody.

That is astonishing. This is a democracy. We do not have a clear consensus.

OK, how will it be for natural gas in 2030?

Today it is 24% of the world mix, we have heard the discussion here on how it could rise to 29% or 34%, so again, please, your votes.

Well gas is going to do much better and just slightly over 50% believe it will be 29% and certainly gaining market share, which is something we have been hearing about today.

So, let us have the third question about the role of coal. Today 30%, in 2030 will it be 30%, 34%, or 22%?

Well, very interesting. Coal more or less holds its market position. But, I think what these results tell us is that we are going to have a lot of inter-fuel competition and a lot of flexibility in these markets as it plays out. Now, do we have any more questions?

No more. This year we do not have the traditional question about what the oil price will be a year from now. We will just leave that for you all to decide as you talk among yourselves. Please join me in thanking our panelists for a terrific discussion this afternoon.