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# THE UKRAINE CONFLICT AND ITS IMPACT ON THE EUROPEAN GAS MARKET

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P R O C E E D I N G S

MR. GADDY: My name is Clifford Gaddy from here at the Brookings Institution, and I am very pleased to welcome this standing-room-only crowd apparently to this afternoon's presentation. I want to welcome you here on behalf of two of the programs at Brookings: The Energy Security Initiative in the Center for the United States and Europe.

I also especially want to welcome our panelists. We have a very distinguished and, in my opinion, quite unusual for this day and time set of panelists. Two of the panelists are co-authors together with a couple of other people of the report that you will hear about today.

The third panelist, and I especially want to give a welcome to, is Robin Dunnigan, Acting Deputy Assistant Secretary of Energy Diplomacy as part of Energy Resources at the State Department. We have a distinguished representative of our government in the United States.

To comment on this report by a Western European and a Russian scholar, Tatiana Mitrova, is one of the leading specialists on energy economics in Russia and in the world. She is at that the Energy Research Institute at the Russian Academy of Sciences, the head of the Oil and Gas Department, and also is a professor at the Higher School of Economics in Moscow and at one of the oil and gas research teaching universities in Moscow; a very, very prolific scholar and well-known to those in the field.

Our own Tim Boersma. Dr. Boersma is in the Energy Security Initiative; Also an impressively prolific scholar who has written a number of ongoing commentaries about the energy security situation, especially in this current, critical geopolitical environment. He is also working on a major book that will be published soon.

To me, the most striking thing is this report were going to hear about

today is one aspect of what's here, but it's also, as I said, the participation. It's sad to say, but there aren't many examples still of collaboration between American scholars or American Research Institute and Russian scholars. We hope that we're not seeing the last of them for a while.

I think it's very encouraging that you're here, Tatiana, and that you've worked together with us and with Tim on this report. It's going to be a unique perspective, and then having Ms. Dunnigan present the US government's position as well as her expert commentary on this report gives us a unique opportunity.

We're looking forward to an hour and a half. We will, unfortunately, have to cut it short promptly at 3:30, and we're trying to stick tightly to our schedule, which I'll be assisted here by Jen.

Let me now turn it over to Tim. Tim, you're going to introduce the whole idea of the project and the report, and then you'll pass it on to Tatiana to complement on especially the methodology of the work that you've done. Then we're going to let Ms. Dunnigan comment on the report and anything else you would like to say, Robin, in the brief time we'll allow you. Go ahead, Tim.

MR. BOERSMA: Thanks, Cliff, and thank you all for being here of course. I would assume that at some point in time Europeans are going to be addressed as Europeans, not Western or Eastern Europeans. But as we will touch upon now, Cliff is very accurate in saying that there may actually be a difference. We're going to get into that a little bit in this report as well of course.

As all of you know, the ongoing turmoil in Ukraine has revitalized once again; the debate on European dependence on all-natural gas from Russia. As I'm sure all of you know as well, the debate is not really new. It's taken place in 2006 and 2009 when there were significant supply disruptions contrary to what we've seen today. So far,

we have not seen a major supply disruption.

In answer to those disruptions, I guess the answer was sought in supply diversity: Finding new sources of supply, new supply routes, and continuing gas market liberalization, integrations, and collaboration between member states, the idea being if you develop your market sufficiently there will be enough alternative gas in the system, and with enough infrastructure in place, you could ship gas freely throughout the member states will be resilient to potential supply shocks in the case they would happen.

Now, we've witnessed the very substantial progress from this fund. Throughout the larger part of Europe, we've seen, for instance, very substantial investments in LNG, regasification terminals, with existing capacity today of almost 200 VCN, which would be around 40 percent of European annual demand. Now, that's not always been used, but that's another story. It is there. We've seen significant infrastructure investments in terms of inter-connectors, reverse law options, and storage facilities throughout the larger part of Europe again.

In light of Russia's meddling in the Ukraine and the unrest that was there, we wanted to test whether the often expressed desire not just in European capital cities and in Brussels, but also in Washington DC, whether the desire to shift away from Russian natural gas would actually take place absent what we've called very drastic policy interventions in the existing division of labor between public and private entities as we know it in a liberalized gas market.

Our hypothesis was that the shift away from Russian natural gas would actually not happen. We thought that would be the case because the main incentive for actors in the liberalized market environment is price, and B would not think or expect that a political preference would enter that commercial lexicon.

In addition, we thought in particular importing more LNG, importing more

alternative natural gas through the so-called Southern Corridor or ramping up the domestic production of natural gas, in particular unconventional resources, we thought all had substantial limitations surely in the short term, but possibly also in the longer term. We've described this in more detail in our paper.

We acknowledged that the context in which a gas trade takes place today is very different from what it was about 8 to 10 months ago. We now in a situation where essentially the United States and Europe are in what you could call or could label a trade war with Russia and sanctions flying back and forth. In that sense, it's a different situation.

The other element that has changed, and it changed long before the Ukraine crisis started, was that pricing of natural gas in Europe has changed as well and the influence of oversupply, which we saw from about mid-2008 on board in the market. We've seen a lot of pressure on what the traditional pricing mechanism was, oil indexation, and we've seen increasingly, and in particular again in the markets that are better developed in Europe, that those pricing mechanisms have gone under pressure and have changed to more spot-based pricing, and it's had -- in general, not all the time -- a downward effect on prices of natural gas. We expect that trend to continue.

Now, given this context, I'm sure you'll appreciate that the title of our paper, which is Business as Usual, is somewhat provocative, if you will. Needless to say, we do not imply that nothing has changed or will change in the future of the European gas market functioning. The title actually refers to the prominent position that Russian natural gas supplies have and, according to our findings, will continue to have in the overall European supply base.

Our analysis also clearly indicates that this is not necessarily problematic. In fact, following over two decades of marked reforms in Europe, it seems

to me that, for the larger part, European dependence on Russian natural gas is not really problematic and somewhat overstated in most analyses.

First of all, the majority of member states have enjoyed fairly stable and fairly competitive supplies for several decades. More importantly, several member states that are largely dependent upon Russian supplies have, because of their policy actions, seen their resilience against supply disruptions and markets of use increase. I think the cases of Poland and the Czech Republic are very good examples of this.

Having said that, I would also say that our analysis shows that a lot of work remains to be done. In particular, in Central and Eastern Europe this is the case. Work would refer to implementing existing legislation, further developing European regulatory framework, better aligning the national regulatory regimes, and attracting additional investments in gas infrastructure, which of course, in a time when demand is actually staying flat or maybe even decreasing is extremely challenging.

In central Eastern Europe, we see that at the moment still gas continues to be the dominant or even the sole supplier, and this situation is not really new. In several of these member states in central Eastern Europe, policymakers have been reminded of this. Ever since 2006, we would argue. We find it surprising that remarkably little in some of these member states has been done to effectively address this issue. There's work to be done.

I think in this context we're going to turn it over to Tatiana, who will talk about our methodology and data and our main findings. I'll get back to you in a bit with some concluding remarks if Tatiana hasn't said it all by then.

MS. MITROVA: Thank you very much, and thanks for the introduction.

What was our methodology and method and data? Don't be scared -- it's just the structure of the modeling complex we are utilizing. It's a complex which was

developed in our Energy Research Institute and which we are normally using for our annual global model, so it's focusing all energy in the oil, gas, coal, nuclear, renewables. But here in this particular case, we were utilizing just these blocks which are related to the oil projections and global gas model, which we actually world gas model which was actually developed initially by a consultancy company, Nexant, and then integrated into our complex.

This is a linear program cost minimization model. Very, very detailed; it's probably one of the most detailed gas models in the world I know. It covers 130 gas producing and consuming countries and models nearly 400 of gas pipeline core doors and nearly 2000 rates for LNG transportation. It has nearly 800 gas provinces or large gas fields with all descriptions, with all the cost data and production volumes.

The output which this model delivers, based on these cost minimization optimization, is how much gas will be in the month, how much gas will be produced; supply and demand balances by country or even for large countries it is split in the notes. Gas and supply costs, rate of utilization of transport capacitors, flows by pipeline and by LNG, and of course, most interesting devices.

What is peculiar about this model: It is very well reflecting this hybrid pricing which we have in the gas market. It has numerous long-term contracts fixed in the model, and they are obligatory for the model. They are taken first at cost which the buyer has to cover anyway. It also has spot prices which are calculated like shadow prices, the price of the marginal supplier.

It's really quite representative for the task we had, and it has a really unique database standing behind the model. It is a very vast cost database for all the projects for all gas transportation projects via pipeline, via LNG. It has very good information on infrastructure, all the routes with their tariffs, with their length, gas demand

figures which we were providing based actually on our microeconomic assumptions and population assumptions, and most importantly, the most confidential I would say, part of the gas industry, these and gas contracts. Actually it's something we've spent a lot of time putting the data together. It's very difficult to find it. You have to do a lot of research in order to get an idea of what prized formula is there in the contract, what is the volume, what is the duration.

We are using all this data, and here are just a couple of examples. It's just print screen from the model; production potential and cost for supplies or infrastructure, transportation, tariffs, supplies. Here is, for example, contract data; all the long-term contracts Russia has with the OECD European countries.

I suppose it's really quite a huge tool which was applied for several scenarios. What were the scenario assumptions?

General assumptions were the same for all five scenarios. We were looking at quite a moderate global gas consumption expectation, that it will increase by 1.6 percent globally, which is not that much, but still good. Gas demand in Europe, according to our estimations, will begin to recover by 2015, and will grow by 20 percent by 2040, but all this growth will appear in the last decades of this period.

Actually, in the first decade you'll see that demand will not recover to the pre-crisis level of 2008 until the end of the period. We are actually quite pessimistic about gas demand in Europe. It will reach 2011-level, which was already after the initial drop, only by 2025. It is quite a skeptical expectation, but if you, for some reason, assume that Europe will have more optimistic macroeconomic development and regulation for gas demand growth, then it will only increase our argument concerning the need for Russian gas. But even in this quite weak market, quite low demand, our results are, as Tim said, more like the case is usual.

We also made very detailed assumptions on a country-by-country basis about gas production in Europe, which will drop to nearly 210 billion cubic meters already by 2020, which is minus one-third of production compared to the crisis period.

Average CO2 price of 40 euros, which is already a strong assumption. You know already CO2 price is about five euros. What is important? We assume that due to the political instability in Iraq and Iran, the Southern Corridor will be significantly expanding only after 2030. By the end of the period, you will see this additional 30 to 40 billion cubic meters coming from Caspian from the Middle East to Europe.

But it's also a result of our internal exercise on Iran and Iraq. If you look again on a field-by-field basis, it's not an easy story to put all this gas on stream. It's not an easy story to build all the infrastructure, and until the sanctions are lifted in a proper investment climate is created, it's very questionable, especially with ISIS and all these geopolitical stories.

Another assumption which is also important to take into account is that only plant LNG terminals are built. No proposed terminals are in this modeling exercise. In some scenarios we are showing that there probably would be a need for additional.org terminal construction in Central and Eastern Europe because it might become a constraint.

Just to illustrate, I've shown to you European gas demand. Here is a picture of total gas production on a country-by-country basis, and you see the drop in this decade is already quite significant. Then it is more or less fluttering with some shale gas production assumed. We are, frankly speaking, quite skeptical about it, but just to have a balanced approach we used here more or less optimistic expectations about production of shale gas in Poland and in the UK. Twenty BCM, some experts would argue that it's already too much, but we decided it's a fair game; let's take as much shale gas as

possible.

Here are the scenarios which we are regarding. The baseline scenario: Case as usual. The grand prize is $100 per barrel, which we used already during the last few years. Russian contracts are extended by 10 years after their expiration date. They will start to expire post 2022, and then we assume that they will be extended but with a different price formula. With an increasing share of spot indexation, we assumed it to 35 percent. We could argue about it, but that was just a basic assumption which seems to be reasonable and acceptable for the Russian side. Stream is constructed in this scenario and Ukrainian is accessible, so everything is fine.

Second scenario is assuming that there is no contract extension, so when they finish, that's it. Then Russia has to either assign new contracts or European consumers will choose other suppliers. High oil prices could be $120 per barrel, no self-stream construction scenario if European Commission doesn't allow Russia to build it, or if, for geopolitical reasons, no Ukrainian transit is accessible. That is the playing field, and so what did we get in terms of scenario results?

Here is the baseline scenario. Anyway, even in the case, as usual, LNG supplies to Europe will increase; it's the first finding. You see that utilization rate of LNG terminals, which is the red line on this left graph, is just currently 30 percent; it's very low. It will increase up to more than 50 percent while utilization of the pipeline capacitors will decline.

The reason for that development is this LNG glut. All this new LNG which is expected globally -- not in Europe, globally -- Australia, East Africa, North America, and LNG which will, according to our modeling, mainly target Asia, but it will affect the whole global situation, and it will bring European gas prices down. You see already starting in 2017, European prices are going down except for the Central

European gas hub, which is obviously in Central Europe, and which doesn't have access to these LNG due to its geographical location; here the prices remain higher.

Then when this glut will be more or less absorbed by the consumers globally, the prices start to increase. This development in this situation, the structure of the European gas balance actually doesn't change considerably, so you see the share of Russian gas supplies, which is blue, is diminishing somehow post-2030 and then expanding again. LNG imports are definitely increasing. It looks like Russia is providing the base load, and LNG is covering this increasing gap between indigenous production and demand. LNG is compensating for the falling indigenous production. That's the structure of the market.

Here in the baseline scenario, in terms of competing suppliers, the share of Caspian and Middle Eastern countries will nearly triple by the end of the period when all these Iran and Iraq guys will become available -- as I mentioned, post-2030 most likely -- while LNG imports will also become more diversified. At the same time, pipeline gas imports from Russia will remain at the level of 150, 160 billion cubic meters until 2025, including the export of gas from central Asia. Then, as the contracts will expire, they will drop down to 125, 135 billion cubic meters, which is still a lot.

There is some decline in the Russian gains in the pipeline, in the share of Russian pipeline gas in the European market. You can see currently it's about 30 percent, and then it will go down to 25 percent. But at the same time, some of Russian LNG will come to the European market, which means that in total, Russian presence will still be quite considerable though the overall gas industry will become definitely more diversified.

In the scenario when contracts are not extended, then LNG imports are increasing faster, obviously, but actually it doesn't drive any spot (inaudible) decline.

There is such a need for that, cheaper LNG could replace expensive Russian gas. But if you make an optimization and if you take into account production and shipping costs for these LNG, it's not that much cheaper than Russian gas.

In this scenario, gas exports from Russia fall to just 100 billion cubic meters by 2040. Russia is supplying an additional 32 BCM as LNG, but generally, even in this case, prices in the market change by only 6 percent, which means that Russian gas is quite competitive and LNG is not cheap at all.

If we are talking about high-oil-price scenario, it is compared to the baseline scenario. Gas prices are 6 to 7 percent higher, which also doesn't make any significant difference for the European consumers compared to all the other changes in the market.

In a scenario without South Stream there are actually no significant differences or difficulties at all. Simply look at this graph showing Russian transportation capacitors via Europe. You can see without South Stream, Russia can manage easily through Ukraine, Belarus, south stream, and north stream. There is already enough sufficient gas transportation capacitors just increasing gas transit for Ukraine, Moldova, and Gazprom Russia can completely replace the Willams of South Stream. I would say that in all areas South Stream is not utilized at 63 BCM capacitors; it's utilized at 25, 30 BCM, which is actually posing the question how large it has to be.

Scenario without Ukrainian transit is probably the most interesting one. Actually completely shutting transit through Ukraine will reduce the gas consumption in Europe by 6 percent in 2015 and 1 percent in 2014. IT doesn't have this catastrophic impact. In this situation actually, Russian pipeline gas in 2015, it is the major difference. It is less by 47 BCM. It's a huge drop for gas which cannot be transported via Ukraine.

But then with the South Stream construction and with the complete

utilization of all the other routes, the situation is becoming nearly the same and support prior says are remaining nearly unchanged in this scenario, which is most important except again for the Austrian market, which doesn't have other alternatives.

These are our main findings, and I think Tim will sum up the conclusions of that.

MR. BOERSMA: Thank you, Tatiana, for the overview. I'll keep it very brief.

The most important lessons that we touched upon in the analysis that you just heard, our main conclusion would be -- to get back to the hypothesis that we wanted to test when we started doing this project -- is that we do not expect major changes in the European gas supply mix as has been plead for by many politicians, particularly in Europe but also on this side of the Atlantic.

The only, what I think, very substantial change that we see in the longer run is that the share of LNG in the European supply mix is going to increase. That may sound to some as some kind of relief, but we would stress that these supplies mostly replace domestic production in Europe, which is declining fairly substantially, particularly in the Netherlands which is going to be the largest producer of natural gas.

From an energy security standpoint, I think that in the short and medium term, the lack of market integration in Central and Eastern Europe and collaboration between different member states in that part of the continent continues to be problematic.

As Tatiana has outlined, in our scenario in which Ukraine no longer functions as a transit state for natural gas, we actually see no significant or no meaningful impacts of that. It's quite substantial if you take into account that about 40 percent of Russian gas goes through Ukraine. If that supply route is cut, we don't see meaningful impacts on 7 of the 8 hubs that we've studied.

The only one where we do see it is Austria, which is an indicator of the lack of market integration in Central and Eastern Europe, and in my view, it confirms that European market integration generates very meaningful results. We would have seen different outcomes had we done this same analysis even if we go back only 5 years ago.

In the unfortunate case of supply disruption in Central and Eastern Europe, that would still be a problem. It reiterates that quite a bit of work needs to be done still to make that part of the continent more resilient to possible supply shocks.

As Tatiana said, we believe that Russian natural gas is going to be very competitive in Europe, although Russian companies are expected to lose some market share in terms of pipeline gas. A part of that is probably replaced with LNG, assuming that at some point in time the sanctions will be lifted, which we don't know. If they would stay in place for a very long time that would have repercussions for ongoing LNG projects in Russia.

Third, in our analysis we account for increases of supply from all the often-mentioned alternatives. But as Tatiana outlined, we don't think that any of them are going to be very transformative in terms of the overall European natural gas mix. You've heard that we do account for increases through the Southern Corridor which, at some point in time, surely will happen, but not in the very short term and not even in the medium term, one could argue. We think that the other alternative, such as ramping up shale gas production, all have their own difficulties as touched upon earlier.

In sum, I think our analysis is yes, that the transformation of the fuel mix in Europe is not going to take place. We believe that all these alternatives that we touched upon are very important in their own right, and we don't want to downplay them; I want to make that point specifically. But we do think that we could keep them in perspective.

We believe that the share of Russia in Europe's natural gas mix is going to be substantial. We also find in our analysis that, for the larger part of Europe, that's not problematic. To sum this up, we believe that the ways forward, in terms of European energy security, lie in more European collaboration and market integration, in particular in the small part of the continent where this has not already happened.

MR. GADDY: Thank you very much, Tim and Tatiana. Now, I'm going to turn it over to Robin Dunnigan for comments on the report and any other comments you would choose to make. The floor is yours.

MS. DUNNIGAN: First, thank you for inviting me. I thought the report was excellent. I don't know if most of you have had the chance to read it. I thought it was very good.

The main takeaway that I had from it was that Russian energy is going to continue to be an important part of the mix in Europe. That's something that the US government agrees with and we've been saying. In all of our discussions over the last 4 or 5 months, we've been very careful to say broader Europe but also in Ukraine that Russian oil and gas is going to be on important part of the mix. I think your report scientifically gets to that point.

That doesn't mean, in our view, that we don't need to keep working and Europe doesn't need to keep working on energy diversification, which we think is absolutely critical to energy security. I'll talk a little bit about our engagement with Europe on that because our bureau and my office are not the technical experts. We really do focus on the energy diplomacy part of it which is how do we engage with Europe in a way that supports Europe's energy security in the United States' energy security.

The report also underscores how important commercial realities are in the European energy mix. Again, that's something that we absolutely agree with, that

often decisions are made based on what's commercially viable what's not. I think your report underscores that.

This points to a question that we are always asked, which is the role of US LNG exports in Europe's energy security picture. We're asked a lot about that because of the licensing process, European countries aren't FTA countries, what about TTIP, and what will that do for European energy supplies.

I think a couple of points are noteworthy: One is that, as your report alludes to, we don't think that US LNG exports is a panacea or a golden pill that's going to fix the European energy security challenges. In fact, the gas revolution in the United States has impacted Europe because were not importing the quantities that we are importing more, so there's more LNG on global markets, and that's affected pricing, it's affected regional hubs, it's affected the ability for buyers and traders to move quantities more quickly, and as to attend mention, it's not just the United States.

There's a lot of new gas coming online: Eastern Mediterranean, Australia, East Africa. The picture could look very different in 3 to 5 years, and I wouldn't bet on what it's going to look like because we don't really know what it's going to look like in 5 years.

But I think it's fair to say that the fact that we are importing less and there's more LNG on the market has affected Europe's ability to negotiate with as a sole supplier. It also has to do with regulatory practices in spot pricing in Europe, but it's also given a lot of European utilities more leverage with gas (inaudible).

I want to talk a little bit about our relationship with the European Union in particular on some of these energy security issues more broadly. Most of my comments really are not in line with your report.

I think there are a lot of conferences and a lot of questions about

European energy security in the last 5 or 6 months, but I think it's fair to say that the US State Department's been working on these issues for nearly 20 years starting with BTC. One of my very early jobs in the State Department was energy officer in Turkey 15 years ago. One of my main priorities was the CJ Han oil pipeline which we didn't have a US commercial interest in. I think we've long recognized the need to move new gas and oil supplies from the source and to Europe.

The Southern Gas Corridor is on the verge of becoming a reality, and again, US diplomatic engagement has been very important in making that actually -- it looks like it's going to happen and will happen soon.

The flagship of US-EU energy cooperation is the US-EU Energy Council. That's met five times since 2009. On our side, Secretary Kerry and Secretary Moniz Charat with their counterparts from the EU last met on April 2nd in Brussels, where we agreed on a diplomatic engagement plan for Ukraine's energy security this winter and looking forward on how we work together on other European energy security issues.

We've worked with Central and South East European countries on the inner connectors, reverse flow, prioritizing, some of the infrastructure projects so that those can get the European Union funding that's available. We worked a lot with our European partners on contingency plans for this winter if, in fact, there is a need for contingency planning. We've worked with our European partners on trying to ensure that where there is possible infrastructure projects that need private investment, that US companies are aware of those projects and have a chance to bid on those projects, so attracting private investment to some of the infrastructure projects.

In the end, I think your report concludes that the challenges that are out there are really the EU's challenges to resolve, but I think that the US and EU have worked together in a really productive way not just in the last year, but over many years.

I would say that I think Europe's better off today than it was in 2009. Storage is more full; the Third Energy Package was a very important development; some of the very important infrastructure projects had happened. I can talk a lot about what we're doing with Ukraine together with the European Union, but maybe that's better in the Q&A, and I can stop my remarks there.

MR. GADDY: Thank you very much. I'm going to turn it over to questions from the audience in a minute, but I wanted to get a couple of questions off my own mind here.

Tim and Tatiana, you report the conclusion is business as usual. One could argue that you set up the whole thing with your assumptions to come out with the conclusion of business as usual. I'm thinking of a couple of points in particular.

Especially Tatiana and the assumptions you made, used your way from radical assumptions; you want to err on the side of caution. The problem with that, some people might say, is you are tending then to eliminate in advance some of the more interesting scenarios which, true, may be low probability scenarios; the consequences would be very grave. When we talk about the idea of contingency plans, this is what we might want to hear from you.

I realize you have limited scope for running these scenarios, but two things that at least I, as a nonexpert, think about in terms of the global energy situation today are the oil price, which is not $100 a barrel and certainly not $120 a barrel. It's going lower; it's lower now, and it might well stay lower. I don't know. What do you say about that? Why did you not consider $80 or $60; give us something interesting in there?

The other is the sanctions or the whole geopolitical situation in general. You said you expect sanctions to be eventually lifted; I'm sure eventually they will be lifted. But what if sanctions were to actually remain in place or be even more severe --

enough to fundamentally impact Russia's production and possibly provoke counter sanctions by the Russians?

Same thing I might say about the Ukraine scenario. Now, you do have the scenario that Ukrainian transit is cut off. Was I supposed to feel comforted by the fact that by 20 years from now will be back at the level we are now? When I saw that huge dip of 30 percent, that it wasn't just overnight that it was going to be there -- it was going to be there for several years. It was a long period of European gas consumption that was much, much lower than what it is today. Maybe I read the chart wrong, but it doesn't seem like to me that's something you can just predict consequences of that for the European economies would be quite severe and what other spinoff effects or what other effects might happen.

My basic question is this, and there's a basic question about your assumptions for the scenarios: Why did you not really think of throwing out there a couple of more radical assumptions? Specifically, I would like to ask about the oil price. That's addressed to the two of you.

MS. MITROVA: We tried to make it an absolutely fair and objective assessment. From the modeling side, I can say we did not intervene with the model in any way. You can't adjust here and there and get the result you want. Here it was an absolutely clear exercise.

With oil price, if oil prices are going down, Russian gas is becoming more competitive. It's oil-linked, and with an $80 per barrel price, it will already be more competitive than LNG globally, than any spot-based supply. That means that it didn't make sense to go for scenarios which are more favorable for Russian gas to remain. It is something we understand; we could take high European gas demand. As I said, we took very, very low figures. Then for Russian gas would be higher.

Concerning Ukrainian transit, I think you really read the graph incorrectly because it was showing only pipeline flows to Europe. It's the same European gas consumption. It is simply covered partially by more LNG supplies, so for these first years of the Ukrainian crisis, Russian supplies go down and they are covered by LNG supplies.

Then Russian supplies are restoring, and that's why we are saying that nothing dramatic is happening, first of all, thanks to North Stream fifty-five BCM capacity, Umal Europe 30 BMC capacity, Blue Stream 16 BCM capacity, and Finland's route. Altogether, it means that we are actually talking about 30 to 40 BCM, which could go through Ukraine or could be delivered from LNG. Attracting 30 BCM from LNG for a little bit higher price is not such a disaster for Europe.

Here I cannot actually imagine any additional significant black swans which could change the whole story. efficiency. Maybe if Europe will push on energy-saving and switched more to coal -- no, no, no, stop. No more coal. Energy efficiency, again, it's something which Europe is making on the temporary basis, but it is a very slow process. You cannot expect an overnight revolution which changes the whole picture. What else? I do not know what could be the game changers actually. You can add more.

MR. BOERSMA: I'm happy that. I would agree with all of that. We actually debated an $80 oil price scenario I recall when we were starting the study. Looking at all the studies that look out in the longer run, 20, 30, 20, 40, we thought, given indeed that we had limited room to do all of these scenarios, but the one that was least likely was the $80 oil price scenario, particularly in the longer run.

In light of what we know today, it would have been good to look at that scenario in light of oil prices being, as you just told me, $86 and a little bit. It would be interesting, but as Tatiana said, it wouldn't have made a huge impact on Russian natural

gas supplies in Europe. In fact, it probably would be (inaudible) than it is in our other scenarios.

I would say that the two scenarios that we looked that, backspace -- one without South Stream being built, the other one without Ukrainian transit -- surely one can think of the scenarios that are even more disruptive, but I would call them fairly disruptive. The South Stream pipeline is being built, so there's a lot of upheaval and this process has been stalled now, but actually blocking the construction of that pipeline would be, what I see at least, is a very substantial and significant decision in Europe. Now, I'm not saying it could not be made. It could be made, but then interestingly indeed we find that it doesn't really have any meaningful effect.

The same goes for Ukrainian transit, and I think you're right. Even though the timeframe may be shorter as we highlight in our study, the effects on Central and Eastern European markets and on the Austrian have -- to me and I hope to others -- are a good reminder that Europe has a lot of work to do there.

The frustrating part of it, at least for me, is that this is not news. We've known this for roughly a decade now that more collaboration in that part of the continent is really needed in order to increase resilience to supply shocks. Our analysis shows that that's currently not case.

Now, we can blame Russia for that if we wanted to, but quite frankly, I think we should blame our own policymakers for not addressing those issues in countries like Hungary, Bulgaria, and Romania because there's just a lot of work to be done. Existing legislation that should have been implemented years ago has not been done such. There's a lot of work there to be done.

On the sanctions front, of course, it may be tempting to say let's assume that sanctions stay in place for a decade or so. I don't know how likely that is. I would

think not very likely, but who am I? I don't know.

If that were to be the case, it would have meaningful impact, but the sanctions today are designed in a way -- and I think this is important to keep in mind -- that they do not affect any of the current production or deliveries or shipments to Europe or to the global markets for that matter. It is designed to specifically target longer-term, technologically challenging projects because that's where the US and Europe and western IOCs have some leverage left, and we can debate how large that leverage maybe is.

The shale oil reserves in Russia, which are allegedly the largest in the world, and Arctic resources, which are allegedly very large as well, they were not expected to come on stream before, what, 2030 and beyond '35? We could assume that sanctions stay in place until then, but sounds a bit of a stretch to me. I hope it's a bit of a stretch.

MR. GADDY: Very good. Very wise answers, and I'm glad I showed my ignorance by asking them. Maybe other people benefit from that as well.

Let me turn it over now to those of you in the audience. This huge crowd here, I'm sure, has a lot of important questions to ask. We have assistance with the microphones. The microphone will come to you, so don't start talking until you are recognized and the microphone is in your hand. As a first thing, if you would identify yourselves, please, and keep your questions or comments fairly pithy. I want to start with Charlie Evans here who is the director of the Energy Security Initiative. Charlie?

MR. EVANS: Thank you, Cliff. I may have read your chart wrong, but I was surprised to see the fairly flat line of gas from Algeria. Now, granted we know Algeria has terrible political problems at the moment, but if we're looking out to 2040, with unconventional gas reserves some people believe in excess of what the US has and a lot

of still-undeveloped conventional gas, I was wondering why you were so sober about that?

A quick second question is what makes you believe if Iran and Iraqi gas actually ever can enter the market with some kinds of political settlements it won't go to Asia rather than to Europe?

MS. MITROVA: Concerning Algeria, and actually we are making this exercise with Algeria and Norway all the time trying to find whether they are able to deliver more gas to the European market because they are currently the major suppliers together with Russia. It seems both of them can't.

Norway just reached its (inaudible) production, and the question is how long they will be able to remain at this plateau and all the new discoveries. They are just prolonging this period but not increasing the volumes.

With Algeria, the problem is that production is declining already; not even stagnating as it used to be 4 or 5 years ago. Now it is declining every year, and Algeria struggles to survive to deliver its contracted volumes already.

Yes, they have additional, mainly unconventional resources and some conventional, but these much more complicated, demanding new technologies as well, demanding huge investments. The whole institutional framework completely doesn't match these developments, and deliver costs of this gas -- production together with transportation -- makes it not very competitive in Europe.

Until 2025, 2030, we cannot expect any additional gas even if tomorrow they will start to invest. These are quite long-term projects. But even then, when this gas will be hopefully produced and delivered, it is not the cheapest one as it used to be with the traditional Algerian gas. It's a different resource base; it's a different development.

MR. GADDY: Very good. Yes, please, from the seventh row back there.

MS. SHAFFER: Hi, I'm Brenda Shaffer, Georgetown University. One question and one comment. One on the methodology: Europe as a unit. That's like saying the disruption of transit through Ukraine would affect 6 percent of the gas to Europe, sure, that could be half a percent to France, but it could be 100 percent to Bulgaria. How in your methodology do you find room for that diversity which is so different in how those disruptions impact different European markets?

Second, on the comment, I would like to actually join Dr. Gaddy's comment about radical events. Radical events are actually the only things we can say are pretty normal. Every 5, at most 10, years we have a radical event in the world system that dramatically affects supply and demand. We can easily say the fall of the Soviet Union, September 11th, the financial crisis, and probably we can say the next thing, Ebola, would be a radical change. How do we factor in radical events because they are the normal?

MS. MITROVA: It's the billion dollar question for any think tank: How to forecast unpredictable events? I am afraid I do not have an answer for that. Usually these are brainstorms and Oracle of Delphi questions. It's very difficult to model them because usually all the factors that you've mentioned, they're lying behind model assumptions. I don't know, but --

MR. BOERSMA: I'm contemplating what the effects of the Ebola crisis are. On a more serious note and as Tatiana said excellently, there are certain things that you cannot model and that you cannot foresee happening. That doesn't mean they don't happen; of course they do. Then the question is: What is their impact? That's a valid point, but it's not something that you can take into an analysis like this because you cannot forecast it.

MR. GADDY: How about the point about distinguishing parts of Europe?

MS. MITROVA: It's my fault. I was trying to put all our findings in six slides -- it's a challenge. It's much more in detail and described in the paper, and, of course, it's calculated on a country-by-country basis. Definitely Northwestern Europe simply doesn't feel any change at all. It's all about the Central and Eastern European countries, and there it's also different.

I would say Bulgaria and Hungary seem to be most affected by these disruptions, and here, as Tim correctly mentioned, Bulgaria has already felt it in 2009, and it was obvious that they need underground storages and reverse flows and additional interconnectors. It was absolutely obvious, but it was not done. Now that I'm following the situation, I'm afraid that I do not see any preparation for a cold winter at the moment, which I think -- I hope we'll avoid any crises this winter, but not taking any measures if you know there is a threat is not the responsible way.

There are figures in the paper, and I think the paper is already available on your website. You can download it with all the graphs and all the figures.

MR. GADDY: That's an important point.

MR. BOERSMA: I forgot to mention it. Yes, it's an important point. It's at brookings.edu/esi, I would presume? Yeah? Good. There you can find the paper and more background on these issues.

MR. GADDY: Robin, any comments here?

MS. DUNNIGAN: I think that the question really points to why the US government's policy has been a country should have an all-of-the-above strategy and they should really look to diversification of sources and supply because there are unknown events that can impact where you're getting gas and how you're getting it. I think diversity is really key, and your question just underscores that.

MR. GADDY: Great. Here at the third row.

MR. WARREN: Rob Warren. You did not cover this in your study in great detail; what I was wondering is could you analyze the situation in Ukraine regarding natural gas supplies at this time? There seems to be an indication that the price is going to be increased or they may have difficulty getting the quantity. What might be the impact? A cold winter?

MS. MITROVA: Not an easy one. At the moment, the Ukraine has about 16.5 billion cubic meters of gas in underground storage. It is using approximately 20 billion cubic meters domestically. Ukraine now has arranged some reverse flows from Eastern European countries. Altogether, it gives more or less sufficient supplies to go through a warm winter.

But even for an average winter, I would say, according to our calculations, Ukraine need an additional 5 to 7 billion cubic meters of gas, which it can currently get only from Russia because there are no other sources available.

On Thursday, Putin and Poroshenko are meeting to have this discussion. Hopefully, there will be a temporary contract for just 6 months to go through the wintertime on a temporary prize basis. It's a very short-term solution, but I hope that it will be done because otherwise it means that either industrial consumers will be cut off when gas is over if there is a cold winter -- last winter was warm -- or residential consumers will suffer.

Don't forget that due to all these events, it's not just gas lacking in the Ukrainian fuel mix, but also coal because most of the coal -- which was traditionally produced in Donas Con Ligas out of 90 mines; just 25 are functioning at the moment. The others are destroyed, and the railroad is destroyed. Coal supplies are also under disruption, and the Ukraine will have to import additional coal from Western Europe, from Russia, from everywhere around the world. I think they've even signed a contract with

South Africa. It's not just a potential gas crisis, but it could be an overall energy crisis, and I hope that timely decisions will be made right now to somehow fix this situation.

MR. GADDY: Thank you, Tatiana.

MS. DUNNIGAN: We've been working really closely with Ukrainians and with the Europeans on exactly this question: What happens to Ukraine this winter, and in the medium and long-term too; not just the immediate term. We've also played with the variables: The mild winter, economic growth or lack thereof.

The good news is the reverse flows from Slovakia and Poland right now are pretty much close to 100 percent capacity, between 95 and 100 percent capacity, which is a little more than a BCM a month, which is great, and Ukraine has filled its storage up to 16.5 BCM. But I would agree that no matter how you play it, it looks like Ukraine is going to need some more gas this winter.

We've been coordinating very closely with the EU and working with the Ukrainians in hopes that the most recent EU proposal is something that both the Russians and the Ukrainians can live with and come to an agreement on. We hope that in the next couple of weeks they do reach some sort of interim agreement.

On the medium and long term, I think it's important that we're not having the same discussion next October. The US government -- through the Department of Energy, USAID, and the State Department -- we're looking at working with Ukraine, and a lot of other governments are doing similar types of programs. We're not the only ones doing it, but looking at how it is Ukraine increases domestic production. It's been at about 20 BCM for 20 years, and so how do rehabilitate existing fields to increase domestic production, energy efficiency measures, and a whole host of things that hopefully by next winter or in 5 years from now Ukraine can choose to buy Russian gas and won't have to.

MR. GADDY: Great, thank you. More questions? Let me take on the fourth row.

MR. DENOS: Thank you. My name is Egor Danayos (inaudible) reporter for Russian newspaper. My question is for Ms. Dunnigan.

Shale gas is part of the US assistance and consultations with the Ukrainian government. Do you consider that exploring shale gas in the Ukraine can contribute to its energy independence, and could you maybe talk a bit about the perspective of US company investments in the Ukrainian energy sector? Thank you.

MS. DUNNIGAN: I think I'd say the same thing for Ukraine that we'd say for all of Europe: Every country makes its own decisions about which resources it's going to develop, and how it's going to develop them.

We do have a program, the Unconventional Gas Technical -- I don't know what it all stands for -- which if a country is going to explore unconventional gas resources that we work with countries on best practices and lessons learned from the experience in the United States. But the commercial decision to go forward with that exploration is up to the country and up to the private sector.

What we are doing with Ukraine is working a little bit on their regulatory structures. We're giving some assistance for regulatory reform so that if and when they choose to do that they can attract good, private investment from the private sector to explore the potential.

MR. GADDY: Thank you. Yes, sir, on the second row right behind you there.

MR. WOOD: Thanks, Barry Wood, RTHK in Hong Kong. I wonder if you could talk a bit about South Stream. I didn't get the figure that you projected for its capacity, but more significantly, is it going to be built? It's certainly not being built in

Western Europe now. Also, I wanted to ask Robin in terms of the United States policy opposing South Stream. How do you answer the Bulgarians and Hungarians and others who want that gas?

MR. GADDY: First maybe just on the facts of the stage of constructions.

MS. MITROVA: In the model we had the whole capacity: 63 BCM. But in all our runs, it was not utilized completely due to the weak European. It's utilization rate was varying from 5 to 11 BCM up to 30 BCM per annum, which is, like, two strings. If we assume high European gas demand it could go far beyond these figures, but in these runs it was not that strong.

MS. DUNNIGAN: I was interested in your slide -- and tell me if I read it wrong -- but there was no South Stream option. The gas made its way other ways and got there.

MS. MITROVA: Yeah.

MS. DUNNIGAN: That's really what we've said on South Stream. It doesn't seem to make a lot of sense to us. The same gas, a different route for a lot of money. Rather than say we oppose it, I don't see it, and your research seemed to play that out.

More importantly, the EU right now has asked its member states to wait, take a look, make sure that the project is in line with European rules under the Third Energy Package, and I think that we need to let that process play out and see where we are when everyone has done their reviews of their agreements and looking at it in the context of the Third Energy Package.

MR. GADDY: Back there; the furthest one back.

MR. BEARY: Brian Beary, Washington correspondent, Europolitics.

I was wondering could you give examples of countries in Europe that

have already taken measures to minimize the disruption both in the short-term and long-term measures? The more positive stories on what countries have done.

MR. BOERSMA: I think that the most prominent examples are Poland and the Czech Republic. Both countries have, with the help of European funds, invested fairly significantly -- in the case of Poland, very significantly -- in infrastructure, reverse flow options on existing pipelines (inaudible), and interconnectors with Germany and the Czech Republic, and another one with Lithuania is being planned at the moment.

What it's done is it's essentially allowed the Polish to be more resilient in case supplies from Russia would not come to Poland it could attract alternative gas from either the Netherlands or Norway or natural gas from any form of LNG from Northwestern Europe. You see that it's worked.

In the Czech Republic, less substantial in terms of financial means. Measures have been taken, some cheaper options, because the country has a smaller market. But as a good sign that it's worked, in July of this year the Czechs have stopped their virtual trading point because they realized they were essentially part of the German market. Whatever would happen in the Czech Republic, it could be counted by natural gas from Germany.

I think those are the most prominent examples where you see that this actually words and that European collaboration here works. There's more work to be done in some of these other member states, but there has been a lot of progress. As Secretary Dunnigan said, Europe is a lot better off now than it was in 2009.

MR. GADDY: Could I just add a thought onto this or a question onto this general question? Maybe Tim, maybe Tatiana, I don't know, but, Tim, I know you think in these terms all the time.

Everything you've described about the measures taken by the

Europeans, if we reflect on all the arguments that were given for all the different energy packages and energy reforms, part of it is about increasing competitiveness. Presumably it's improving the market, the goal of which ultimately is more efficiency and lower cost.

The other reason that's always in everybody's minds about all these reforms in Europe from infrastructure and everything else is, of course, about energy independence -- about reducing dependence on Russia, and like almost any policy of insuring yourself or providing more security in any respect, it's costly.

You are choosing not to do the most efficient thing -- even though if the world were perfect and the Russians were the nicest guys in the world, you'd take the Russian gas and you wouldn't ask questions because it makes the most sense -- you say they shouldn't do that because then you're exposing yourselves to the leverage of bad Russians.

I know this is an impossible question to ask with any great degree of rigor perhaps, but just in general, if you look at everything that's been done and everything you're now talking about that Europe should be doing, how big of tradeoff is there between economics -- which certainly should be pretty prominent on everybody's mind if you're European and thinking about the fragility of the European economy and recovery -- on the one hand and security on the other? What would you say about that?

MR. BOERSMA: I think it's an excellent question. The way I look at what's been happening in Europe over the last decade or two is I would argue that economics prevails in almost all of these situations. I would point at the lack of investment that we've seen in parts of Central and Eastern Europe until very recently, like in countries like Poland.

On the one hand, you have the security narrative which you hear very prominently in Eastern Europe -- and I guess this is where Eastern and Western

Europeans are somewhat different. That security narrative which tells you Russians are bad news, and you don't want to be dependent on them, and this is a problem.

But on the other hand, you can observe that the actions taken do not really match that big security threat, because if this as such a big problem -- as is often portrayed in policy debates in the continent -- then you should wonder why on earth hasn't this been invested a long time ago.

In the case of Poland, who have done quite a bit of work a number of years ago, we hear this all the time. You talk to any policymaker, and the first thing that happens is you get a lot of big security talk and a lot of rhetoric about Russia and how this is problematic.

Talk to business people in Poland, and you'll get a very different narrative because these people will go for the cheapest option. They'll go for the economics, and so they'll trade with Russia and say, by and large we've enjoyed fairly stable and fairly competitive supplies.

Politicians see this differently. But then if you look at what actions have been taken to address this problem, they don't correspond; those two narratives don't correspond.

I think this is part of the problem in the European context, and it has hindered some of these countries to address their energy security challenges, if you still want to call them security challenges of course.

MS. MITROVA: I also want to add to that. I was just thinking what was the most successful that Europe has undertaken during the last 10 years in order to reduce dependence on Russian gas? The economic crisis dropped demand. That was really the main driver why Russian exports to Europe are now not 180 as they were supposed to be according to the contracts signed by Europeans but just 135. That's how

the dependence was reduced.

I don't think that it's a really productive way to reduce dependence, and actually all our modeling exercises showing that -- the price of the question we are discussing, the William, it is 30 billion cubic meters whether they will be coming from Russia or from the other sources. It's a big deal, but not such a big deal.

If I were in the Europeans' shoes, I would go for diversification, but at the same time, it's very important to have this perspective; where is the elephant in the room and where you adjust putting some cherries on the cake. It is important to have cherries as well, but first of all I would try to manage the cake to be properly prepared. (Laughter)

MS. DUNNIGAN: In fairness to our European colleagues and partners, I do think we should go back to the fact that there has been really important progress made in many countries over the last decade. The Third Energy Package has had and will continue to have really important effects on making the market more degraded and more competitive.

I think it's also important to note in this conversation that as dependent as Europe is, Russia is also very dependent on these revenues for their export earnings and their government budget. It's an important element to remember in this discussion.

Finally, I also think that the European Union does have the projects of common interest under the connecting Europe facility where projects don't make 100 percent commercial sense and need a little help for energy security reasons. Under the PCI, countries and member states can apply for and get these funds. There are a lot of competing projects; there's only so much money to around, but it would be good to see those projects be prioritized and be funded sooner rather than later.

MR. GADDY: Great. Let me first take the young lady there closer to the windows, and then I'll come and get you on the aisle there next.

MS. BERNSTEIN: Thank you. Leandra Bernstein, RIA Novosti. I'd like to follow-up on the question that was just asked because in the United States we often talk about energy security in Europe, which generally means, as you said, curbing the influence of Russia. But the conclusion of your report, as the panel said, is that Russian energy will still play a very important role in the European mix for the foreseeable future.

When you look at the American, western strategy -- the security concerns, trying to curb Russia's influence by going after this energy component -- how do you make sense of that? You mentioned the rhetoric versus the economics, but how can you make sense of this future of the importance of Russian energy, but then the rhetoric of the so-called security?

MR. BOERSMA: Security rhetoric, yeah. My short answer would be that in a market environment that there is in Europe today, economics dictates certain realities, in my view. Now, of course, one can change that. The market reality as it is today does not necessarily need to be the market reality of tomorrow, and unexpected events, shocking events, could trigger such policy interventions. We cannot account for those, but we have noted, and I would note again, that, absent of such drastic policy interventions, we do not foresee significant change. Then in that constellation you have to look beyond the rhetoric, but it's part of the debate.

I would also caution to dismiss -- and this, I don't think, we wanted to do at all with our study or with our findings -- to dismiss political realities. It may very well be that there is a mismatch between what one would see a market do or expect a market to do and what political realities are. Of course, those can be not aligned. Then again, it is possible for a policymaker to decide to intervene and design measures to change those realities, but we, at this point, do not foresee that happening. Not sure if that's a satisfactory answer to your question, but that's what I was (inaudible).

MR. GADDY: Do you still have a question? Good.

MS. MANDEL: Hi, thanks. Jenny Mandel with EnergyWire. A related question directed towards Robin.

What I'm hearing is that there is potential in the coming months to have significant shortages in Ukraine specifically and Bulgaria as well. It seems like over the past many months we've seen that when there is a flare-up of activity in the Ukraine, then there is a corresponding flare-up of political interest in Congress. Measures are debated which it sounds like you may be saying aren't really necessary. These are bigger, structural changes, but natural gas exports in the US and how those should be tailored to the European situation.

Given that we can expect, if there is a cold winter or even an average winter, potential shortages that would get big headlines in the US, how are you responding to that, and what does it mean for US policy developments that may or may not be appropriate in the longer run that's being forecast here?

MS. DUNNIGAN: I do think US energy exports matter in the way I spoke about before and the impact on global markets, but our first LNG exports aren't coming online until 2015. Then most of the license that have been approved start coming online in 2017, 2019. US-owned energy exports isn't going to be a solution or part of a solution for any problem this winter.

Regarding the debate in Congress on our LNG export policy, our LNG licenses are governed by the Department of Energy. You can actually go on the Department of Energy's website and see who's in the queue and where they are and who they're going to sell to. You see that those companies, commercial entities that have been granted licenses, have contracted for their gas, and they're making commercial decisions about where the gas is going.

I don't envision a scenario in which the US government comes in and tells companies that have contracted for gas already to send it somewhere else. That doesn't mean I don't think US LNG exports in the immediate term don't impact the situation, because as I had mentioned before, I do think they do because of the impact on global markets.

But we are working hard to help ensure -- as is the EU and as is Ukraine -- there isn't a crisis this winter. We're doing a multipronged approach, and I think a lot of governments are doing a combination of -- DOE just had a team out in Ukraine for several weeks looking at contingency measures.

If there are gas shortages, USAID is doing work with energy efficiency measures. A lot of other governments are doing work. We're doing a lot of work with long-term planning on domestic production. The EU is working very hard, and we're supporting that effort to try to get the parties to reach an agreement.

MR. GADDY: Let me follow-up on this. Suppose there were a really cold winter and a real crisis in Ukraine. Did I understand you and Tatiana right, Tim, that the only source of gas is Russia to make up the difference between what you outlined or in a real emergency would it be possible to get more gas from somewhere in Europe?

Robin, you said the US government has people in Ukraine talking about contingency measures. What would they be? What are we telling them in a really bad crisis? Presumably that's the kind of contingency somebody's planning for even if my point about doing a scenario of it is different. Suppose it were a really, really cold winter and people were freezing and starving too probably. People will die. What could be done?

MS. MITROVA: I'm afraid in this situation Russian gas is the only solution, but you have to understand that it doesn't start in November or December. So

far, Ukraine already has quite a good amount of gas in underground storage, and it will definitely cover demand for the first few months of the winter. We are talking about potential problems probably at the end of February or the beginning of March. It's not like the whole winter, but I still hope that they reach a solution with the Russian gas supplies, and I hope it will be fixed right now, not in February.

MR. BOERSMA: Limited options, I think so too. Assuming that there's no natural gas transit to Europe as well, which would be substantial. Contrary to the situation we've seen in 2006 and '09, the Russians have gone a reasonable length to make sure that they meet their contractual obligations in Europe. But assuming that would not happen and they would say, okay, look, we've got to stop this because at some point, I would assume, the Ukrainians would decide to use some of that transit gas for their own as it's happened in the past.

Assuming the Russians would say, we're going to stop all of this, as been described earlier, the opportunities to ship different gas into Ukraine are limited. They're almost entirely used at this point.

The ability of Europe to get natural gas into that part of the world is also limited. As we touched upon earlier, that's exactly the part where more integration is need. I think for the larger part of Europe you could, in fact, (inaudible) supplies, but then that part in Central and Eastern that are still vulnerable would suffer as well. That period of shortage would not just apply to Ukraine but also to countries like Hungary, Bulgaria, maybe Greece, that part of the country.

MR. GADDY: I have time for one more question. Wayne, is that you back there?

MR. MERRY: Hi, Wayne Merry, the American Foreign Policy Council.

Gazprom is one of a number of very large, Russian, parastatal entities

that have quite significant debt-service loads that they are going to have to pay money in the next 15 months. Rosneft is another, and it, of course, also exports energy to Europe. To what extent are these entities as much dependent on maintaining their revenue streams from the European sales as the consumers are in need of the energy?

My question is basically is Gazprom also to some degree now, at least in the next year, year and a half, a prisoner of debt service, that it has to be a reliable supplier because it needs the money to pay off that very considerable load of debt that's coming between now and the end of 2015?

MR. GADDY: Thank you. Tatiana, you can take that.

MS. MITROVA: It is; you're right. European exports are providing two-thirds of gas from revenues while all sales to Russia and to CIS are providing just one-third. You can understand how substantial it is for Gazprom's functioning. Not saying about the new investment projects, it has to build power of Siberia. They started construction on the 1st of September, so they definitely need financing for that.

Here this mutual dependence like turtle and snake case, about friendship, it's the same story. Moreover, it's not just Gazprom; it's the whole state which is strongly dependent on the budget revenues. Thirty percent exports for pipeline gas. It gives approximately 10 percent of total Russian budget revenues. You can imagine the country, which is facing sanctions, which is facing at the same time quite weak economic (inaudible) 10 percent of budget revenues -- it's a big deal. Nobody is going to risk this, I think.

MR. GADDY: All right. I guess that's good news. (Laughter) Let's stop there before we come up with another bad scenario. Please join me in thanking our panelists. (Applause) Again, I thank all of you for coming.

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