



## DEBATE

### **Cécile Maisonneuve, Director of the Centre for Energy at IFRI**

Thank you, Bill. That is another call to policymakers. We could also have a philosophical debate on your presentation about the fact that history repeats a lot, the fact that we know how to learn lessons from history and that one revolution may hide another. It is time now to have our first debate on these issues. We have talked about geopolitics and geoeconomics and the way that economies are competing not only through labour and social costs but also through energy costs. I now give you the floor.

### **François Dassa, EDF**

Good evening. Clearly industrial competitiveness and the price of energy – gas and electricity – for industry are of real concern, as has been clearly explained and shown for Europe and Japan and we see it every day as a utility with our customers, but I think we should not forget the power purchase element. The price of energy is not only important for industry but also for consumption and growth on a macroeconomic level. Of course you can have short-term solutions that lead to cross-subsidies between different types of customers, in other words to make industry pay less and final or residential customers pay more. However, this is a short-term solution as in the long term you will negatively impact your growth pattern and this depress demand. This is what is currently happening with the debate in Germany, for instance, where you have huge over-prices due to renewables which are only borne by final customers, which depresses demand, and that ties into the debate we have had this morning about global imbalances in Europe. That can be a bigger issue because of those types of policies. Unfortunately, my remark is that the structural solution is to try to develop and deploy least-cost solutions in the long term. Cross-subsidisation can help in the short term to avoid dramatic effects, but we need to have longer-term solutions. In that regard I think the power purchase of final or residential customers is as important in the long term as industrial competitiveness.

Secondly, regarding the difference between gas and electricity in terms of competitiveness in Europe, with gas the situation is geological, whereas with electricity you have a gas component through the CCGT, for instance, the combined cycle to produce electricity, and you have a policy component in terms of the choices made by Europe as to the mix of electricity sources and that has an impact on electricity prices. It is very important to have those impacts in mind when defining policies regarding electricity. My question for debate is regarding gas. We have a debate about shale gas, which is centred on a question of geology, and it is not clear whether it will be as much of a game changer in the US as it could be because of geology and costs. Mrs Van der Hoeven, you have mentioned LNG, which can of course help in Europe, but it is not certain that it could help that much. The price today in the US is USD 3.5. If you have transport, liquefaction and all of the necessary infrastructure that puts the price at, let us say, USD 6. That is not too far from today's price in Europe. If prices go up in the US as forecasted then the advantage should not be that great.

My question for the panel is should we not look for other avenues, such as, for instance, the dialogue with Russia, in order to secure our long-term energy needs in Europe and to transform our dialogue with Russia from a commercial one to a long-term partnership in order to decrease costs? We have some technologies that are of interest to Russia and they have the gas, so maybe we could do something in that regard.

### **Cécile Maisonneuve, Director of the Centre for Energy at IFRI**

Thank you. I propose we take other questions before the panellists answer.

### **From the floor**

I was somewhat dismayed by a discussion of energy policy that did not discuss supply expansion, which it seems to me would always be at the top of the list in the United States. We are coming out of the outsourcing thing. The chemical industry in America had abandoned America. They were going to relocate to Saudi Arabia or somewhere. They signed treaties of accommodation with the environmentalists for a whole series of insane environmental issues that they now have to live with because now they have to come back to the United States. That advantage is going to be more costly than it was. They are not going to be as competitive as they would have been. However, we have had some advantages in the United States, partly accidental, partly not so.

The subsurface ownership rights of minerals in America are an important difference. It means that the landowners in the United States become partners with the developers. They both have a joint interest in exploring, if not agreeing, the opportunity of extracting oil and gas from beneath their properties. The system in the rest of the world of government ownership means that the landowner gets some of the inconvenience and none of the advantage. There is no reason why you could not rethink that.

Another aspect, for reasons that are partly rational and partly just American, we do not have the same obsession with climate change that you do in Europe. There is a debate in America about the whole topic regarding the science and the wisdom of rushing to raise the price of energy, something I think we will avoid. I am not sure where you are going to go with that.

However, do not assume that America is without its problems. We have tremendous opposition to pipelines, as everyone knows from the Keystone pipeline, and we also have incredible difficulties in putting in high-power electrical interconnections. In many ways we have a very Balkanised electrical grid in America. We have the east, west and – for reasons that only have to do with American politics – Texas as three separate grids in the United States. Those have historically been state-regulated, so we have good interconnections within states but very weak interconnections between them, which means we have a lot of entrapped electricity, tens of thousands of megawatts, that can be generated but cannot be delivered anywhere. There is tremendous opposition to greater interconnectivity. We also have the same crazy energy subsidies for anything that is not economical that you do. If it does not make economic sense we subsidise it in the energy area.

All of that suggests to me that we should think more about the supply side for energy. Mitchell, the man who figured out how to make fracking work, was an individual outside of any of the big oil companies, outside of government, who just went out and tried something that everyone thought was crazy and now he has revolutionised the industry. We at CI say you do not have to teach the grass to grow. Get the rocks out of the way and let the grass grow on its own, and most of the grass in the energy area is suppressed today because of excessive amounts of regulation, institutional arrangements that do not encourage people to do it, and I think we have the ability to produce massive amounts of energy and Europe does not have to suffer in that regard. You have got shale here, too. We have to recognise that the supply side is part of it and I thought it was not discussed adequately.

### **Cécile Maisonneuve, Director of the Centre for Energy at IFRI**

I suggest we answer these first two questions, the question about the dialogue with Russia, the axiom of resource capacity to the axiom of resource abundance, and reminding ourselves what the reasons are for the shale gas revolution in the US. We all know that it should not be a game changer outside the US, especially in Europe, but what about the game opener? This is the question I want to ask our panel.

### **Maria Van der Hoeven, Executive Director of the International Energy Agency**

I have a couple of remarks. First of all about the shale gas revolution in the United States, the only reason why it started was because of the prices and because the technology advanced. You are right that the United States is the only country in the world where the landowners also own the resources on or beneath their land and it has been helpful. Let us be fair about that. However, while shale gas is almost everywhere, it is not always simple or easy to exploit it. The gas infrastructure is not always there and geology plays a role. There are also water issues and



environmental issues and the gas can be situated in remote areas or in densely populated areas, like it is in Europe. It is therefore very difficult to replicate the shale gas revolution anywhere in the world at this time. We do not think these limitations will persist. We think a country like China will eventually exploit its shale gas resources. They need to because otherwise they will face sky-high import prices.

Regarding the breakthrough to Russia, what is interesting about Russia is that Russia knows exactly where its market is and it is true that part of that market is Europe. However, Europe is a declining market. It is not a booming market anymore. There is not an expectation of much more gas use in the next 10 to 20 years. There is, however, another booming market and that is to the east. We can see that Russia is responding to that and diversifying its markets. New pipelines are being built to the west and to the east. LNG is also a factor to the east in addition to pipelines. I think Russia is quite clever. They know exactly where their markets are and where they can get the most out of it.

That brings me to one other issue I would like to mention. You mentioned the cross-subsidies within electricity. You are right in that regard and Germany is a very clear example of that. Wholesale prices are currently lower than retail prices. Those who do not have a solar panel on their roof are paying the highest costs because of the surcharge. That is exactly the problem we are facing and they have to do something about it because otherwise the social acceptance of the renewable subsidies will disappear. The same goes for Japan where subsidies for renewables are double what they are in Germany. Germany is rethinking its renewable mechanism, as are Spain, Italy and Portugal, not only because of the prices but also because of the huge amount of renewable energy they can produce and which they cannot get rid of. They cannot get rid of it because of the connection to France, which means they cannot sell it. If you really want to do something about that it is not only about the production of renewable energy it is also about transport and distribution.

I think it is stupid that we are not currently investing more in technologies that will help us bring clean fossil energy to the consumer. In that regard there is one elephant in the room we have not mentioned and it is called coal. To be fair, there will be a huge amount of coal used, not only now, but in 2050 as well, so it is extremely important that we do something about clean coal technology, about gasification and about CCS.

#### **William Ramsay, Senior Advisor of the Center for Energy, Ifri**

That is a pretty hard act to follow. I have just a couple of points. One is that you owe yourself a bit of candour on Russia and Russia's supply capabilities. I know that EDF is a shareholder in South Stream, which is priced out at something like USD 60 billion if you include the upstream fields, so it is not going to be trivial, and that of course has to go to the European consumer and I cannot imagine why a European consumer would want to pay for capacity they do not need in the first place, as they are doing with North Stream. How far does this have to go and where is Russia going to get this gas? It is going to get from fields where they really have not demonstrated their ability to get the gas out at any kind of a price that we would be willing to pay in this world of moderately lower gas prices. I am therefore not too optimistic about incremental gas in Russia. They might do better to keep the gas that they are flaring in their pipes, with independent producers, and they could fix their own gas system, but incremental gas in Russia where you have to put the infrastructure in may not be economic anymore. They have fooled around too long.

The other point made was about the supply side and the fact that shale gas reserves in Europe are not being exploited. That is true, but there is a big difference between how Europe operates and how the United States operates, not just the subsoil thing. In the United States we have had a vocation for years of producing oil and gas. Texans think of a refinery as a vacation destination. It is a totally different mindset and in order to deal with these things European countries have to go through a lot of revisions. While there are gas potentials in Europe, such as in the southeast of France, the fact is that you cannot produce that gas until you have regulatory systems, safety procedures, oversight and experience in place or somebody will make a mistake, as the cowboys did in the early days of US gas exploitation, which poisoned the reputation of US shale gas with some shortcuts in the early days. We cannot afford to do that again, certainly not in Europe, because the people will not tolerate it and it will be shut down.

**André Caillé, Director of Junex, Canada**

I have two remarks. First of all, it was not only the United States that had a regulation that provided for 3% of the value to go to the surface landowner. We have had that in Quebec. Unfortunately for my industry, it was changed at a time when everybody thought there was nothing beneath the ground. It was removed from the farmers. I think the situation would have been completely different in the lowlands of the Saint Lawrence River if that 3% had remained in place. Therefore I fully agree with you that there has to be an interest for the surface landowner for any of this type of development to happen. Otherwise it becomes very difficult because it is only the government that benefits from the development and people increasingly do not care very much about government revenues.

My second remark concerns the European relationship with Russia when it comes to supply of natural gas. This is only a suggestion from a non-European. I think this may be the time to move from that strictly commercial relationship to a real partnership. Maybe your supplier will start to consider the possibility of LNG imports from the United States. For instance, there is one project that has been successful. It has been put in place by the French company Cheniere. Our friend here was the one who sold the LNG to the European markets. That has an effect beyond the European markets because when LNG is loaded on a tanker it reaches the global market. It becomes like oil. It can move all over the globe by displacement. I think that suppliers here, such as Gazprom, may be interested in looking in establishing a longer-term partnership beyond a strictly commercial relationship. That is a suggestion from a North American.

**Christophe de Margerie, Chairman & CEO, Total**

I have a few comments. I have been working in this industry for almost 40 years and I am still in it. I am surprised to see how many doors we are still opening that are already open. For example, we discovered that in the US you have access to solar revenues. What a scoop! In many countries you cannot do it, but you can redistribute the revenues in a way that goes directly to the cities where the oil and gas is being produced. I take your point, which is very important. We focus on many things except, first, the cost of supply. I agree with you. In the industry, our first goal is to reduce our cost and we have a problem with that today because we mix everything. One day we will have to tackle that. When I was young and totally crazy, I thought that the best way would be to first, go in the place where you have access to oil and gas at the cheapest price- which means the cheapest cost- and then one by one, you go to the next and the next and next, which would mean today that Angola would not be produced. However, all countries have their own policies. That is true in Europe, too. There is no policy regarding energy in the world, not at all, so we try to invent things afterwards and give a good reason why. The best example of this is Brent WTI. It is not because there is more WTI or more light oil in the US that you have the WTI price going down. It is because of logistics. People are playing with this for refining margins. We all know that the market will be open and if the laws in the US were liberal, which is not the case because you cannot export oil in the US without state permission – and some people do not know this, that oil is kept under a certain control which keeps access to oil at a cheap price – you would have more oil on the market, another 1.5 million barrels per day out of 97. The impact is limited. That is why the real price is not WTI. It is the real price of half of the United States of America. Even in the south it is Brent. That is because the logistics factor does not exist there.

Another example: I was listening when you were talking about the price of electricity and the price of gas. Sorry, but electricity is not primary energy. Each time, I have to repeat : electricity comes from oil, gas, coal – unfortunately – nuclear and renewable, but it is not primary energy, so to say that the price of electricity is more than the price of gas is just nonsense. I am sorry, but it is nonsense. Electricity has its price and the market price of electricity is set by a different market to that which sets the price of gas. You know this. It is just like talking about electricity that is clean or unclean. Electricity coming from coal is unclean. In Germany, we all know that. What are they doing? They have tried to get the benefit of cheap coal to produce cheap electricity when they pay high prices for renewables and renewable electricity. We all know this. We all have the figures. However, it is not as easy to use because we are in a system which is still political whether we like it or not.

If those in charge do not get us out of this, we cannot do it. Saudi Arabia – one of my favourite countries – is still burning a huge amount of crude oil for electricity. Everybody knows it. They are doing this because they do not have enough gas and they do not want to be dependent. When I am told that nobody cares about dependence I do not believe it. Everybody cares but nobody wants to say it. Go back to reality, just like for the price of gas. We have been



fracking in the world now for more than 50 years. We were not just faced before with tight oil. Now it is shale oil. It was tight oil and tight gas before. Now it is shale gas. However, we have been fracking gas for many, many years. It was not shale gas. It was tight gas. We have been doing it in Nigeria for many years. We have been fracking oil soil for many, many years. It is not new technology. That is untrue. It is an old technology which needs to be improved. I agree fully with Maria on that.

**Cécile Maisonneuve, Director of the Centre for Energy at IFRI**

Thank you. We have another question here.

**From the floor**

I would like to say that in my mind the shale gas and oil revolution is more of a game changer rather than just looking at the quantities which are at stake. The US does not export energy today. It will happen in 2015. However, when the shale gas in the US displaces coal to produce electricity and this coal is exported to Germany it is exactly the same as exporting gas. You are exporting coal at the price of shale gas, so it is a kind of synthetic export of gas which has already started and which has already influenced the price of electricity in Europe, but it has also influenced CO<sub>2</sub> emissions. The US has no policy today on CO<sub>2</sub> emissions and last year was the best year in the last 20 years without any policy on CO<sub>2</sub> emissions. On the other hand, you have Germany, which is giving a lesson in good governance to everybody. We have people paying a huge amount of money to have renewables and yet we are burning coal or lignite to produce electricity. The shale gas is therefore already producing and is already a game changer even before exports start.

Secondly, today you are more than 50% of the gas market in Europe, which is no longer based on value. More than 50% is based on the gas index. How did this happen? It is because each time I see a government in Lithuania or in the Ukraine, although maybe the Ukraine is not an example, I am still in the offices of a government and I hear, 'The American can do better than the Russian.' They therefore use America as leverage to negotiate with Russia even if they do not import LNG from the United States. Hillary Clinton is talking about the soft power of the USA if the USA exports LNG in opposition to the power of Russia in Europe. It is a game changer.

Another anecdotal example is that we were in negotiation with China and for some reason there was no LNG for China because they did not move fast enough. The Chinese Ambassador made an official complaint to Obama because China felt that they were being punished and in the mind of China every decision is made by the government and not by a company. The good news for Cheniere is that when Obama listened to this complaint he started to take us seriously as a real project. Each a governmental authority from Japan and India goes to the United States they are talking about gas and they ask the US for liberalisation of gas exports. They discuss the WTO rules and so forth.

Regarding costs, over the last five years the cost of the production of shale gas was reduced by 700%. If you put the lateral length of each horizontal well, the time to drill, the cost and the initial production in the first two years you have a 7% increase in efficiency of shale gas production. I am not sure that we know of a lot of industries which have made such huge progress in efficiency in such a limited period of time.

**Christophe de Margerie, Chairman & CEO of Total**

You know why? It is not economical. When we produce shale gas today, we are losing money. We cannot even produce dry gas. Even with rich gas, the price of ethane is the same as the methane price. The price of propane and butane has dropped to USD 4 to USD 4.5. It is nothing to do with the price before. Why is that? That is because there is too much of those products on the American side that they cannot swallow because they cannot export, and because they cannot export, the prices are dropping. When we say it is competitive today, it is competitive for the consumers, not for the producers.

**From the floor**

That is true.

**Christophe de Margerie, Chairman & CEO, Total**

As Maria says, and I used this at the last IEA Ministerial meeting – I have only thing in common with not the “Greens” – I am green – but with the “green Greens” - which is that it is true that shale gas is not good. They used me to say, ‘You see, even the Chairman of Total is saying shale gas is not good for the economy.’ I said, yes, because it is not profitable. I am serious. Why did we have to reduce the cost? It is true that we have the pressure of the market. It is good to be more efficient. We need market pressure. With market pressure we have been forced to cut and cut our costs by more and more. Maybe one of the reasons we were not sufficiently taking care of our costs was that the price of oil was so high that everything was acceptable. All the costs had therefore been jumping skywards at the time. It was 148 and we are now back to 110/111. Why is that? That is because everybody was thinking it was nice to have. Contractors and everybody thought that. It was always do-able. That was a big mistake. Today we know that it is not the case anymore. As you said very well, Maria, we can still sell at a high price to keep the margin for good reasons rather than spoil it through doing things we should not do, such as higher costs and nothing being clean. There is therefore a difference between the price and the cost and there is always a difference between being in a purely liberal system where you sell at any price and in countries where you have taxes, responsibilities, acceptability and so forth.

**From the floor**

I would agree on dry gas, but on wet gas are you now flaring 0.3 BCF a day of that kind of gas with a negative value?

**Christophe de Margerie, Chairman & CEO, Total**

Yes, we are.

**Cécile Maisonneuve, Director of the Centre for Energy at IFRI**

The gentleman wanted to intervene there.

**Ernst Von Weizsäcker, Co-Chair, International Resource Panel (UNEP)**

Thank you. I used to be a Member of Parliament in Germany at the time when we created that law on renewable energies. In a sense I am a culprit of what happened. However, industry is actually flourishing, including energy-intensive industry. They are very much benefiting from the renewables revolution in Germany.

My main point is of a different nature. I liked very much what Maria Van der Hoeven said about climate. It is not going away. It is getting worse. As you know, the Philippine delegate at the Warsaw conference said he was going on a hunger strike until some results come. Of course he will die because no results are there. Anyway, the climate situation is really serious and I like what Maria Van der Hoeven said about efficiency. I would like to add to that. When I am teaching my students I always ask them how many kilowatt hours would be needed to lift a bucket of water weighing 10 kilograms from sea level to the top of Mount Everest. The average answer I get is anything like 500 kilowatt hours. The answer in terms of physics is a quarter of a kilowatt hour, meaning our imagination of what a kilowatt hour can do is wrong by a factor of 2,000 or so, which means that all of our demand estimates are built on an incorrect estimate of what we can do with a kilowatt hour.

There is a revolution technologically available, but it is not happening for the very simple reason that energy is so ridiculously cheap. Of course the people always complain it is too expensive, but in terms of technology development it is too cheap and I would like to see a coalition emerge between people who sell energy at a high price and people who really care about the long-term environment.