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We not only have an energy revolution but also maybe the beginning of a new industrial revolution in North America, and the question when you talk about a revolution is whether it will expand, because historically we see that revolutions tend to try to expand outside of their borders. Therefore, the question there is not only about the replication of what is happening in the US, in Europe or in Asia, on shale gas, but also the effect of these low prices on the global market. Maria Van der Hoeven raised the issue of the evolution of the price on the gas market, but we also have to deal with the question of the oil markets. There I turn to Bill Ramsay about this topic and the consequences of what is happening on the oil markets and on traditional oil producers.

I do not know if I need to introduce Bill because he moderated this session last year, but he has much in common with those who sit at this table. Like Maria Van der Hoeven, he has held a position in the International Energy Agency as a Deputy Executive Director. He has one obvious thing in common with our chairman, but I will not say which one. You can guess. He has one thing in common with Mr Caillé, which is that he is from North America, and I must add that he has been the Director of the IFRI Centre for Energy and a Deputy Assistant Secretary of State in the United States. Bill is going to raise the issue of patterns in markets to talk about the history, geography and a bit of a prospective view. Thank you.

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

Thank you for that, Cécile. I would like to view this economic competitiveness issue as a broader economic viability issue and look at it from the producers' perspective and maybe offer a little contrarian perspective on this that not everybody shares, but I want to give it to you anyway. Since we have so much time I am going to go back to the late 19th Century to start. I am going to tell you about the hog cycle in the oil patch, and that is to say that if you look at oil and its beginnings in Titusville, Pennsylvania in 1859 they found that the stuff had tremendous value. If you refined it a little bit you could use the light oil for lighting. It replaced whale oil. It was smokeless. It was terrific. The market was immediately created as soon as somebody started producing the stuff and the prices spiked. By 1861 the price was at USD 110 a barrel in 2009 prices, really a high spike at the beginning of this market. Four years later the price tanked predictably, and I will come to that again later on. This was the Drake Well in Titusville, Pennsylvania. It might have been hard for Total at the time. It was 69 feet deep.

Looking at crude prices from 1861 to 2009, you can see that spike that took place in the early years and, as with any commodity market in its early days, it was thin, it was volatile and it jumped all over the place, but it then became very stable for 100 years. This 100 years of stability was interrupted by a couple of things. A lot of the oil was produced in the 1920s in Baku. When the Bolsheviks went into Baku and burned all the oilfields things got a little bit tough in the oil market. It worked a bit for the Rothschilds and the Rockefellers, but everybody else was paying a pretty high price for oil. A number of other things happened along the way.

Until the embargo of 1973 prices were pretty well stable. In 1973 we had the oil embargo and the prices spiked once again, and by 1977, four years later, the Shah was encouraging the United States to buy more of his oil because he was having a tough time placing his oil, so in four years the market partially responded to the 1973 spike. Two years later, in 1979, another spike doubled the price of oil and by 1983, four years later, the Saudis were having to do a little bit of a deal with the ARAMCO partners to place the oil because the ARAMCO partners wanted a bit of an incentive to guarantee the offtake of Saudi oil and so some price deals were struck. This was only four years later after the 1979 spike. Then in 1986 it got a lot worse.

In later years we are talking about prices of just below USD 100 on the WTI schedule, and you have to add another USD 12 or so for Brent because of the differential we were hearing about a bit earlier from Mr Caillé. In the intervening



years we have had a few other things happen. We had the Asian financial crisis, we had the demand shock of 2004 when we completely goofed on China and then we had the ramp to 2008 that drove prices to new heights, and for three years now we have seen Brent prices, after the collapse in 2009, go back up again and we see Brent for the last three years head over USD 100 a barrel.

Around 2006, when gas was running above USD 12 a million BTUs, in the US we had a technology fix. The guys who had been working on this for all these years, the entrepreneurs who had been trying to get gas out of shale for decades, finally got there with those kinds of prices. With the horizontal drilling, with the fracking technology, with some other things, they started gas coming out of shales and revolutionised the gas market. The same technology cascaded into the oil shales, and the US is on its way to energy, oil and gas self-sufficiency. I advisedly do not use the term 'energy independence'. It usually takes us the first two years of an administration to convince the president not to use the term 'energy independence' and the Congress has never learned. Never mind.

Looking ahead in regards to liquids, oil, in the United States over the next years, there is a projection of a bump down starting in 2020, and of course you can believe it will go down in 2020. But these kinds of depletion schedules do not stay fixed in time, they typically slip in time, so you are probably going to find those major resource moving beyond 2020 when –Middle East/Gulf producers – expect to get back in the catbird seat and feel good about their position in the production chain because they have a greater control in the market. We, for the time being, are in 2013 and the US is not the only boom going on out there. We have got Canada's Athabasca, we have got the Iraqi southern fields and we have got Venezuela's Orinoco – and I am sure that President Maduro has to recognise one day that he has to reopen Venezuela, as was done in Apertura, otherwise the country is going to have some tough times. Brazil's Tupi slips into the future, but it is not going to slip that far. It will be in the next few years. There is Angola's Pre-Salt and Kazakhstan's Kashagan, and Total ought to feel pretty good about that by now – they have brought some order to Kashagan, which is a very nice thing.

Therefore, where are world prices likely to be? Well, where should they be already with all this oil around? I think they are high because of a lot of geopolitical fizz. Where is the geopolitical fizz coming from? We have got our hardy perennial market antagonist in polite discussions, relatively, with the perm five plus one, so where are these discussions going to lead? Are they going to lead to some kind of a resolution of issues that would allow Iran to get some movement back into its oil fields? We know that there are lots of folks who would like to get back into the Iranian oil fields and that would be yet another source of oil – in addition to Canada, Iraq, Venezuela, Brazil, Angola and Kazakhstan – who could add 10 million barrels of oil a day to the market in the next 10 years.

Who is the swing producer? The swing producer has traditionally been Saudi Arabia, and I do not see any other volunteers out there for the time being, so we have to think about what the consequences for price would be if this oil continues to come onto the market at this kind of a pace. The probability of a price fall is ranked fairly low by many, but the consequences of such a fall could be fairly significant. If you look at the social cost of oil the way things have been evolving over the years how much does it cost to produce a barrel of oil? That is irrelevant. How much does it cost for a producing country to survive with its budget with the numbers of barrels it has to export? Right now the social cost of oil of many countries exceeds USD 100. That means that they are already in deficit, the Nigerians and the Russians of course. Russia fortunately has gas, but oil is not that favourable in terms of the Russian budget. Venezuela is slightly higher than Russia. The Saudis say they need 100. We have heard them say that. Iran is between Nigeria and Russia.

Therefore, we are going to have to wait seven years for the key oil producers to get back into the catbird seat and yet indigenous populations are rising quite rapidly. I am not talking about the populations of expatriate workers in the Middle East. I am talking about indigenous populations. They are growing rapidly. There are hundreds of thousands of people without jobs. 80% of them are under 30 years old. There are going to be a lot of changes in the next seven years. Monarchies will evolve. There may be some new monarchs in the neighbourhood. The efforts to forestall a second Arab Spring are very expensive, and so while seven years is not a very long time we do have to get there from here.

I refer to something some of you may have seen before in a history book, *A Distant Mirror* by Barbara Tuchman. In 1986 the oil price demand increases of 1973 and 1979 worked their way through the system: demand destruction and



recession, supply response in the North Sea, Alaska, the Saudis swing, supply roll, the price collapsed on the netback strategy when the Saudis got fed up with being the swing suppliers and Iran put a couple of rockets into the *Petrostar XIX* and other product tankers in the Gulf in April of 1986, a pretty harsh outcome. Now, three years of USD 100 a barrel oil, unconventional fossil fuels that are surging, sluggish economies worldwide, conventional sources are growing beyond just the unconventional, geopolitical fizz could be coming out of the market, although there is always a volunteer out there for trouble – if it is not the Yemen it is Libya, or someone else – but not on the scale of Iran, that is different, and the oil producers need USD 100 plus a barrel. In summary, who will be the swing producer this time? Our markets have demonstrated time and again that supply will respond to price. Why should it be any different this time? While this is not a forecast, it is just a plausible scenario, but I would think policy makers want to give it some thought. Thank you.