

# OLIVIER APPERT

## Chairman of the Conseil Français de l'Énergie

I will not discuss long-term issues and I will not discuss climate change. I will focus my presentation on short-term issues and oil and gas, which is a topical issue in the Middle East. You know that the rapid rise of US non-conventionals triggered a dramatic change in the world's energy. I will focus on the implications on the short-term and mid-term energy scene in oil and gas. This shale evolution has huge geopolitical consequences and OPEC recently changed its strategy dramatically. The fall in oil prices which has resulted has deeply damaged the economic welfare of oil-producing countries, even those with healthy financial reserves such as Saudi Arabia. This has also had a dramatic effect on the gas market.

In my short presentation, I will highlight the main facts and figures in this game changer of US non-conventionals. I will then present my views on the short-term and mid-term impact on the oil and gas market. I would just like to remind you as an example of recent history in the oil market. Since the beginning of this decade, the world has experienced a dramatic growth in light-tight oil in the US. Every two years, a new Norway has been put into production in the US, and the US has become the most significant oil producer, surpassing Saudi Arabia and Russia.

At the same time, there were some structural concerns regarding demand, and as a result, the market appeared to be oversupplied by 1-2 million barrels per day. Surprisingly, in November 2014, OPEC decided to maintain their production in order to keep their market share. This new strategy was clearly described by Ali Naimi, the Saudi oil minister, during this OPEC conference. If OPEC decides to reduce its production, which in fact means Saudi Arabia, the price will go up, and Russian, Brazilian and the US shale oil producers will take our share. Somehow, we are in a new paradigm for the oil market.

As all of you are aware, the shale revolution started in the US a few years ago. This revolution is coming from the mobilisation of new hydrocarbon resources, tight reservoirs and source rock. A new business model has also emerged, based on intensive mobilisation of two well-known techniques that have been used for decades in the oil industry. These are horizontal drilling and fracking. Shale producers have been able to dramatically improve the efficiency of oil production. For example, the initial production in tight oil formation in the Permian basin increased by a factor of almost 10 between 2007 and 2015.

I just have a few figures to illustrate this unexpected phenomenon. Since 2011, the average production per well has been doubled and the duration for drilling wells has been reduced from 20 days to seven days. The number of wells per annum and per rig increased from 16 to 47. As a result, the break-even cost of shale gas and shale oil production has been dramatically reduced. Thanks to these technological breakthroughs, oil and gas shale production in the US has been much more resilient than anticipated.

Despite a drop in the number of drilling rigs and fracking units by a factor of more than two in 2015, LTO production remained almost flat. It started to decline only in the last few months, after a further drop in the rig count. In the case of gas, production continued to grow during the same period. The shale producers are very reactive. When the price of oil reached USD 50 per barrel in July, immediately, the number of rigs increased. This will lead to an increase in LTO production in the next few months.

The oil companies reacted very rapidly by reducing their cost and more specifically their investment. Upstream, oil and gas investment reduced by 25% in 2015 and there was a further reduction of 17% in 2016. In the US, the drop is more significant, at around 50%. For the time being, this drop is having no impact on conventional oil production. Oil

companies are producing at the maximum rate, as the OPECs are lower than the oil price on the market. However, due to the natural depletion of the fields, production will decrease sooner or later. We estimate that this drop-in investment will result in a lack of conventional oil production of about 4 million barrels per day in 2020.

On the demand side, the situation is changing compared to what happened in those last few years. Oil demand is expected to grow by only 2 million barrels per day this year and next year. However, the growth in demand continues to slow, dropping from a five-year high last year to a four-year low in Q3. The situation of China is symptomatic. Chinese oil demand growth all but vanished in Q3 compared to one year ago, pulled down by a substantial slow-down in industrial oil usage. This seems to be a structural shift in the Chinese demand pattern, which has been the engine for world demand growth in the last 15 years.

However, at the same time, surprisingly, production from OPEC, driven mainly by low-cost Middle East supply, has risen to an all-time high. Russian crude and condensed production surged by 0.4 million barrels per day to a post-Soviet high of more than 11.1 million barrels per day. Clearly, the resilience of Russian supply is due to very low production cost, linked to the fall of the rouble against the dollar.

Despite the drop in non-OPEC production and the slow-down of oil demand in the market, the market is still over-supplied. A massive oil inventory, on the other hand, is keeping the market under pressure. As a result, oil prices dropped dramatically in the market. They went down to USD 30 per barrel at the beginning of this year, creating an increasing concern amongst producing countries. The market was still over supplied. In February, and later in April in Doha, the OPEC countries and Russia made the first attempt to try and stabilise the market. The price went back to the range of USD 40-50 per barrel. However, for the bulk of producing countries, this is still much too low to rebalance their economies.

On 28 September, OPEC countries took the decision on principle to reduce their output by around 750 KBD. This decision ought to be finalised during the next OPEC meeting, which will take place on 13 November. The market reacted immediately and the price went up, but afterwards, it went back again. The decision at least contributed to stopping a further decrease in the price. Many questions have been raised. Is a reduction enough to rebalance the market? Will Iran and Russia agree to contribute to this effort? What will the reaction of US producers be? Will OPEC countries comply with their commitments in the long run?

I will just comment on a cartoon from *Upstream*, which clearly highlights OPEC's dilemma. It features comments from OPEC delegates in Algiers, who say, 'I think we can all agree it does not make any sense to flood this fragile market with more oil'. Then you have the reaction of the shale producers who say. 'We are back at USD 50 per barrel. Man the pumps, frack those wells and ramp up production'. Will the next OPEC meeting be a success? One may consider that such a decision will just have the effect of a sword cutting through water. Or will it be a Pyrrhic victory?

The medium-term situation is no clearer, but perhaps more challenging. As explained before, we may anticipate a drop in conventional oil production at the end of this decade. The geopolitical situation in the Middle East is raising major concerns. On top of that, the spare capacity within OPEC countries is at its historic lowest level. We may anticipate that the oil market will rebalance, but this may not be smooth.

Now I will just say a few words on natural gas. It is necessary to discuss natural gas in Doha, and the shale revolution has also a dramatic impact on natural gas market. Shale gas and tight resources in the US are huge. 800 TCF are available at a price of USD 3 per million BTU. Gas production is increasing despite the low prices of gas at Henry hub. Whereas the US was importing increasing quantities of gas for decades, now it is exporting LNG. The first LNG trains have been passed and started producing at the beginning of this year. Additional units are under construction. In 2020, export capacity will reach around 80 BCM.



The US can deliver gas profitably, both in Europe and Asia. Thanks to specific clauses on cost of liquefaction, the marginal cost of US LNG is competitive even in a low gas price environment. On top of that, US supply is very flexible, with no take or pay and no destination clause. US LNG will play a major role on the international market. Thanks to the new export project, by 2025, the US will become the biggest LNG producer in the world. The natural gas market is between commoditisation and globalisation. A new international market is emerging where the price will be based on the Henry hub price plus liquefaction, transport and regasification costs.

This dramatic change will have a major impact on the geopolitics of natural gas. Just consider the case of Europe, where internal production has been declining for many years. It will rely more and more on imports from Russia on one side and from the US on the other. The European continent will be placed at the centre of a US-Russia battlefield. Also, in Asia, there will be competition between US LNG suppliers, suppliers from the Middle East and Australia and local suppliers.

In a nutshell, the shale revolution is a major game changer. It will last quite a long time and it is impacting dramatically the international oil and gas markets. It introduced a completely new paradigm, which is impacting both producers and consumers. It is mandatory to take into account these new drivers when we consider both the short-term and long-term evolution of the energy sector.