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Home » Files » Fossil Fuels » Oil: Stabilization or Lull Before the Storm?



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## Oil: Stabilization or Lull Before the Storm?

31 August 2016

By Andrey A. Konoplyanik

Recently this author was invited to appear on a TV programme [1] at the Russian RBC TV channel to speak on trends in the oil industry. The moderator opened the debate with the observation that “in recent days the dominant view has been that the oil market has stabilized and that nothing interesting has been happening in this market. Is stabilization the new trend? ... For how long will this equilibrium last?”

This author proposes to pass through four geographical checkpoints where developments can change the situation at the oil market, to what is called, “over-keel”, and thus transform current quiet conditions into a “lull before the storm”. The reason is that all four groups of factors discussed below increase uncertainties in relation to the global oil market.

### 1. Paris – COP-21

There are fundamental long-term phenomena of which we cannot foresee their future consequences in detail today, but we do realize that these may become key factors in determining future trends. For me, one of these key factors is COP21 – the Paris Agreement (179 signatory states) within UN Framework Convention on Climate Change, which regulates measures to reduce CO2 emissions post-2020. The Agreement was prepared during the climate conference in Paris, adopted by consensus on 12 December 2015 and signed on 22 April 2016.

It was already known, but within the COP21 framework it has been articulated more precisely, that if we wish to limit global warming to 2°C without large-scale implementation of carbon capture and storage (CCS), then we will not be able to consume more than one third of global proven recoverable reserves (PRR) of hydrocarbons (HC) up to 2050. The International Energy Agency (IEA) has already proven this in 2012 by detailed calculations of possible CO2 emissions from consumption of PRR HC through all energy value chains. This means technological chains from production to end-use on each fossil fuel (coal, petroleum products, gas) in each energy/non-energy use of energy resources.

According to the IEA, the cumulative future CO2 emissions from current PRR HC volumes (i.e. the part of geological/in-situ HC resources which are technically and profitably recoverable with today's available technologies) are three times higher than the upper limits of emissions agreed upon in Paris bearing in mind sustainable global development. Almost two thirds of such potential emissions will come from coal, 22% from oil and products, and 15% from gas.

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This means that the paradigm of energy development might radically change: instead of limitations on the resource base of world energy, e.g. supply side limitations (discussed below), the contours of possible limitations on the demand side of global energy induced by the climate-based restrictions on emissions are becoming visible. And such demand-side limitations might manifest earlier than the supply-side limitations that some experts predict. This might radically change the whole global energy picture.

In the past, discussions were mostly about possible timing and scale of the peak of "Hubbert's curve". That is to say, about reaching the fossil fuels extractive industries' maximum development level conditioned by the American geophysicist of the Shell Oil Company Marion King Hubbert, who described the rule of oil production (oil production profile) as early as 1949. His bell-type curve is a major component of the "peak-oil" theory which contributes to concerns about depletion of geological oil (and other non-renewable energy) resources.

It shall be clear for energy economists that the peak of Hubbert's curve has been constantly moving upward-right. This took place because the energy resources which were previously known as "unconventional" and thus had been located outside of Hubbert's curve, have become "conventional" and thus have moved under (inside) this curve. "Unconventional" energies are placed outside the curve because they are (1) unknown; or (2) they are known but technologically non-recoverable due to lack/absence of corresponding technologies; or (3) they are known and technically recoverable but non-recoverable from an economic standpoint, i.e. it is not profitable to produce and utilize them. But as new extracting technologies appear (technological breakthroughs) and/or existing technologies are modernized in the process of their exploitation (technological learning curves); and costs go down as a result, non-conventional energies become conventional.

Within the same group of potential supply-side limitations are the consequences of the so-called "Hotelling rule" which the American economist Harold Hotelling presented in his paper on the economics of non-renewable energy resources in 1931. He stated that the value of fossil fuel left in-situ would increase in value equal to the current interest rate within a given time-frame. This means that mineral resource rent is the addition to its price for the expected depletion of such energy resource.

However, both theories neglected to consider possible demand-side limitations. As a result these theories conclude that the future value of non-renewable resources in-situ will increase over time.

Such landmark understandings of the future possible consequences of supply-side limitations have resulted in and were reflected in the first report of the "Club of Rome" – "The Limits to Growth" (1972), which contains modelling results of human population growth and natural resource depletion. It was a response to that alarmist report of Sheikh Ahmed Zaki Yamani, the Minister of Oil and Mineral Resources of Saudi Arabia through 1962-1986, who uttered the phrase that has become very famous since: "The Stone Age did not end for lack of stone, and the Oil Age will end long before the world runs out of oil."

Thus, it might be that the limitation for the oil age will be demand-side limitations coming from COP21. And if so, then oil (PRR) might not increase in value over time, but might diminish in value (to some extent an opposite to the Hotelling rule), since not all of today's PRR might be demanded by the global economy. This means that the global market could be facing postponed oversupply, accumulated in current PRR, which can lead to decreasing value of in-situ oil because potentially it will remain unclaimed.

The very fact of such a shift in the debate changes the whole future logic of possible energy development. Firstly, because it provides incentives for quicker extraction and utilization of the current PRR HC. This will accelerate expectations of the "cheap oil" era ("cheap" in this case not referring to decreasing production costs but to the diminishing price society is willing to pay for it) as a result of the future possible oversupply artificially created by the climate change agenda.

From Paris there is a bridge to Riyadh.

## 2. Riyadh – "Strategy 2030"

Is it not from this perspective of potential demand-side limitations, that Saudi Arabia has proclaimed, by its new potential future leader – Deputy Crown Prince Mohammed Bin Salman Al Saud, who is the Kingdom's second Deputy Prime Minister and Defense Minister, and the chairman of the Council for Economic and Development Affairs, the new economic programme of the monarchy – "Saudi Arabia's Vision 2030", which was adopted by the Council of Ministers on 25 April 2016? Its substance is diversification, and more straightforward – deviation away from oil. Is this because the Kingdom feels the danger of possible demand limitations?

This programme tells me, inter alia, the following: it is clear that the Kingdom possesses huge PRR of conventional oil which is among the cheapest in the world with regards to production costs.

of conventional oil which is among the cheapest in the world than regular oil production costs. Saudi Arabia is placed in the geographical center of the "energy world", located between main consumption centers. It has access to the deep-water Persian Gulf and to the World Ocean (though through Strait of Hormuz), its oilfields are located nearby the coast. This is why it has flexibility of supplies, and it is not physically tied up with specific consumers. As a result, the Kingdom has the lowest production and delivery costs to consumers which guarantee ARAMCO the lowest level of cut-off prices in any price war. The Kingdom contains the highest level of idle oil production capacities which it has been using in the past to regulate the global oil market to support the high oil price level.

Saudi Arabia could do this now as well but it does not want to anymore. It is not the case, however, that the Kingdom is abandoning its regulatory efforts because it wants to start another price war in order to protect its market share. Instead, I suppose, the new macroeconomic logic which underlies this new strategy is that the Kingdom wishes to diminish energy costs for its domestic manufacturing industries (consumers of oil and products) which it would like to intensively develop in order to increase competitiveness of manufacturing production of oil-related industries with higher value-added (second-third-fifth steps in economic cycle/technological chains) at the global markets.

The new economic development strategy (Vision 2030) of the Kingdom clearly articulates the intention for diversification – and it is unavoidable and economically justified if, first of all, it will develop petroleum industry-based industries with higher value added both in energy and, especially, non-energy use of energy resources.

That's why I don't think the most prominent idea in the "Vision" is the partial privatization of ARAMCO (expected to be up to 5% of stocks of what is considered to be the most expensive company in the world) even though this part of the "Vision" attracted major attention of commentators. It seems that the understanding has crystallized in the Kingdom that progress cannot be stopped and that deviation away from oil as result of multi-facet diversification will continue. (Implementation of Sheikh Yamani's observation, mentioned above). That's why I don't consider partial ARAMCO's privatization as a goal in itself but rather as a means to raise adequate investments for post-oil reindustrialization.

The modern wave of energy diversification (the first wave is generally attributed to Winston Churchill's famous statement made in 1911 that "Safety and certainty in oil lie in variety and variety alone") started in the 1970s, after the first oil embargo, as the intra-oil-industry diversification (intensive non-OPEC oil development triggered by the high OPEC oil price) stipulated the "to diversify away from OPEC oil" policy. Then it was followed by an intra-energy diversification triggered by the first "to diversify away from oil" policy (inter-fuel substitution first within fossil fuels), subsequently followed by the "to diversify away from fossil fuels" policy (nowadays marked by an increasingly competitive shift from fossil fuels to renewables, where possible). That is what happened on the supply side.

On the demand side the competition took place between major factors of production: capital, labor, energy and non-energy natural resources (a modified version of Adam Smith's "capital, labor, nature" model for key production factors). "Energy vs. labour" competition started in the 1970s in the form of migration of energy-intensive industries from developed market economies to developing market economies with a cheap and plentiful labour force. "Energy vs. capital" competition took place in the form of improvements in energy efficiencies through all energy value chains in all areas of economic activity, where the value of energy savings paid back investment costs in energy efficiency improvements. Today a new component to this multi-facet competition between production factors has been added: this is the climate change issue, "energy vs. emissions" competition which might establish upper limit of energy production not by its competitiveness with other production factors but with direct restrictions on emissions.

So it might be unprofitable for the PRR-rich countries with low production and delivery costs, such as Saudi Arabia, to divide the upper limit of production (the latter established below existing PRR values due to climate change limitations) with its competitors – other energy producers with higher production and delivery costs. The only thing that can prolong in such case the "oil era" for Saudi Arabia (and other low-cost producers) and thus to provide the longer and softer shift to non-oil-only (i.e. diversified) economy is really low oil prices, even at 10-20 USD/bbl level. That might be affordable for the Kingdom but will have killing effect on most other oil producers.

Saudi's experience of the 1980s proves this thesis. The country then tried to regulate the market with the aim to hold oil prices high. It first played the role of flexible "swing producer". But as a result, through the whole first part of the 1980s, when oil prices began to slowly decline from their 1981 peak, the Kingdom had to diminish its production and export increasingly below its OPEC quota level. This was done to compensate overproduction (above their quotas) by most of the other OPEC states which tried by such actions to reach the levels of their preplanned budget revenues which came short due to price decline. When Saudi's accumulated losses had reached unacceptable levels, while at the same time the price decline continued, the Kingdom sharply

raised its production to its OPEC quota level at the end of 1985. This immediately had a downward effect on price; as a result many oil investment projects beyond OPEC became unprofitable and dealt a painful blow to the budgets of other OPEC states which had been freeloading (parasitizing) on the Saudi policy aimed at oil price protection. But all Saudi oil was in demand then and was profitable for the Kingdom, since the production and delivery costs were then as well as now among the lowest (if not the lowest) in the world.

From Riyadh – to the USA.

### 3. USA – shale oil

In the past, Saudi Arabia was the only one regulator of the physical oil market. The USA has been since the late 1990s and through the 2000s the sole regulator of the paper oil market. Nowadays, with the revolutionary development of US shale gas and oil, this country has “jointed in pair” with Saudi Arabia in its ability to influence the physical oil market. But if the Kingdom can influence the market in the “centralized” manner, because its production comes from a few megafields of conventional oil under full control of state-controlled ARAMCO and its huge volume of idle production capacities, the US situation is totally different.

Shale production is the extraction not so much of “resource” rent per se (mainly by the means of “economy of scale”), but of “technological” rent (due to permanent implementation of technical improvements). This is why US shale production is provided by a huge amount of small and medium sized specialized companies within the broad diapason of production costs, for instance, according to Rystad Energy, from 10 to 80 USD/bbl and above. [2]

As a result, if Saudi Arabia and its ARAMCO and/or other major producers of conventional oil (primarily major state-owned producing companies) can act as the market irritants, the USA in current conditions – though it may sound strange – seems to have a different role: the role of market stabilizer. Moreover, it is a very flexible market stabilizer, but, contrary to Saudi Arabia and other major oil producers, it is not managed/regulated from a single center. If there is a sharp perturbation at the market resulting in oversupply and a drop in prices, then some horizontal wells within the above-mentioned price diapason, having become unprofitable, would be temporary closed (for instance, implementation of hydrocracking will be stopped at already drilled horizontal wells); this will diminish oversupply. If the prices went up, then both fracking at the drilled wells will continue as well as the drilling of new horizontal wells for new cracking. Thus supply increases and the price increase is slowed down.

But what is the major difference between conventional and unconventional (shale) oil? Shale oil production has a very short investment cycle (economic life of a shale well) since the debits decline sharply – by 50-60% within the first year, by 80-90% within 2-3 years. But within the liberal model of the US economy this has led to a very sharply falling “learning curve” in shale production. This means the ability to implement achievements of “evolutionary technological advances” due to permanent improvements of existing technologies. In other words, it is possible to decrease production costs almost in real time.

This means that price fluctuations which take place in the market due to different factors can be quickly dampened by the US industry in a decentralized (market-based) manner, in both directions, and in parallel with continuing diminishing costs, contrary to the very inertial conventional oil industry which reacts to price fluctuations with time-lag.

One of the last sources of short-term fluctuations in this quartet is Brexit.

### 4. United Kingdom – Brexit

I am not sure that Brexit will end up in a real Brexit (factual UK exodus from the EU). I appreciate the quick and well-organized change of the UK Prime Minister by the UK Conservatives with intra-party procedures, and the fact that the new PM Theresa May has already stated that, despite the fact that she personally has voted Remain, she will follow the will of the UK citizens expressed at referendum and will continue with all the formal procedures on leaving the EU, and that she will not call for a new referendum on the issue since she does not question the results of the first one. Nevertheless, there are still many uncertainties with regard both to how and when the practical results will be finally achieved of implementing the referendum’s outcome. And it is not given that the final result will be the real full-scale exodus of the UK from the EU as it might have been considered by the voters who have voted with a small majority for Brexit. Thus uncertainty remains.

But the very fact of continued expectation of the exodus has already set the financial markets on fire. Half of London’s City, which in its entirety serves about 1/5 of international lending and has been, together with New York, among two global financial centers, has started preparations for a possible move to other EU financial centers to be ready (in case the Brexit will really take place) to quickly adapt itself to work from another place within the EU, e.g. to stay within the zone of the single EU licensing of financial services. It is clear that to stay outside the EU means for London’s

city to make its financial services for the EU (from non-EU placement) more risky and more costly.

What are possible consequences for oil market?

Under continued uncertainties about the consequences of the referendum, with the UK pound falling to its lowest level in three decades, investors – seeking shelter against the weak pound – would like to invest their money into physical, tangible assets. The price of gold has already gone up. They will invest in other precious metals, real estate, antiques, and other “real values”. The question is: is oil currently among them? Is it still the stable asset which was so attractive for investors to compensate for the fall of the US dollar exchange rate in the 2000s? Within the above-mentioned framework, is oil today still the same attractive asset to compensate the post-Brexit decline of the UK pound as it was during the fall of the US dollar a decade ago? I’m not sure...

To conclude, I think these four problems create so many uncertainties that it would be better to consider the perceived “stabilization” of the oil market as “the lull before the storm”. To speak of a trend of stabilization seems to me entirely inappropriate.

1. Ros Bisness Consulting-TV (www.rbc-tv.ru) programme “Babich. Trend” on 06 July 2016.
2. Impact of North American shale development. Presentation by: Bielenis Villanueva-Triana, Shale Analyst at Rystad Energy. Delivered at the 2nd international conference of the Adam Smith Institute December 3, 2014 Moscow.

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