

Energy trends in the Middle East & the role of national oil companies



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Evolution of oil prices

1. Crude is now beyond USD 70 a barrel. What are the drivers of this rise? Is it likely to increase more?

Oil price would not have recovered in the last two years without OPEC's decision to work with major non-OPEC producers to curtail oil supply. However, this increase was assisted to a large extent by the robust demand growth, which is subsequent to the low price of oil after the collapse a few years ago. Some other incidental factors that may not have been tied only to oil, such as issues of national policies, economic cycles, etc., have also played a role; however, at the end of the day, it was the balancing of the supply against the demand and the beginning of cutting down of oil inventories that impacted oil prices.

Oil price recovery was helped, to some extent, by the fact that growth in North America was slowed initially, almost to a halt as the oil prices forced North America Light Tight Oil's (LTO's) producers to rethink their plans until they were more certain about price. They adjusted rapidly, and they managed to stay profitable at lower prices than the originally anticipated breakeven point.

All of these factors played a role in current price: the slowed-down LTO growth in North America helped demand grow, and OPEC curtailing with non-OPEC producers helped on the

supply side. It first stabilized oil price in the first 18 months, and then we began to see, with evidence of prices rising through inventories.

Today, the situation has slightly changed from a year ago. Indicators reveal that this year, LTO's production will be very robust. Both IEA and OPEC have revised their short-term outlook with increased LTO levels. Last year's stability in the market reflects that OPEC is working well. Therefore, it is reasonable to expect that OPEC will have to decide how to respond to face the expected increase of LTO production this year. Will it cut down supply more? Will the demand growth compensate North America's LTO increase? If we see similar circumstances than in the past, with supply increasing much more than demand and oil price dropping down dramatically, we will see an action from OPEC and non-OPEC producers. On the other hand, with the recent continued rise in prices, helped by the events that have adversely impacted Iran's and Venezuela's production, OPEC's leader, the Kingdom of Saudi Arabia (KSA), and Russia are now signaling that they are ready to act to ensure that the market remains well supplied and prices moderate, in order to avoid another round of demand-growth destruction. OPEC and other producers have learned from the lessons of the past.

2. Are we entering into a period of stability of oil price?

I am optimistic that the stability achieved on the market will continue without dramatic imbalances, although some people

predict wild swings. IEA continues to express their concerns about excursion of prices upward, while OPEC is worried about possibility of dramatic drop in oil prices. For OPEC, supply-and-demand imbalances would result from a lack of investments, and existing demand growth would be a result of economic growth. For IEA, preoccupation about price excursions stems from the fact that they feel that the low-price environment over the last few years would continue to discourage investors; hence, as a result, there would be a dramatic shortage in the market, and that creates upward price excursions.

The actions of OPEC and non-OPEC countries' actions have resulted in an increase in spare capacities, de facto because cutting down production has immediately generated an equivalent of spare capacity. This spare capacity could decline if facilities are not maintained or if investment stops. Assuming those are properly managed, the current spare capacity is healthy. Assuming we reach a point where we see dramatic imbalance between demand and supply – demand being much more than supply – then OPEC will be able to respond quickly because they have enough spare capacity. Once again, OPEC has learned the lessons of the past in this regard, and now, even ministers are echoing the sentiments that allowing prices to increase is not a good idea. Spare capacity is here to moderate the market. Saudi and Russian Ministers have recently indicated readiness to relax production cuts for that reason.

In the beginning of the last decade, in 2005–2006, OPEC did not succeed in moderating the price of oil because they did not have much spare capacity. When demand grew rapidly, OPEC hesitated to invest, leading to more and more tightening of the oil market. This was punctuated by the financial crisis in 2008, but resurrected again in 2011, 2012 and 2013; however, prices collapsed again, as a result of both the large demand-growth destruction and the emerging technologies to produce LTOs, and others, massively.

3. Are we seeing a long-term alliance between OPEC and Russia?

It is important to notice that OPEC has struck a point in time where allied non-OPEC producers, Russia in particular, are of the same view with OPEC. Russia now recognizes the benefit of being an actor rather than a free rider, as it had been, for the most part, in the past. This has resulted in Russia's energy policy shifting, and that has helped.

4. Have we entered into a new world order of oil with two swing producers, Saudi and US?

Indeed, Saudi and the US are now both swing producers, but their influence is driven by different considerations. For North America, the driver is the immediate financial bottom line, and not much consideration is given to trying to balance the market, as the case with OPEC and other producers. In OPEC, especially over this period, they have a spare capacity that they can bring

in if necessary. In North America, producers think commercial first, but they are de facto a second swing producer. If prices rise, their quick investment can result in quick returns, due to the nature of investments in the LTOs. For conventional producers, this process will take three to five years at least, maybe longer for some difficult projects.

I believe most investments in the current upstream oil & gas environment will be in the conventional oil business, towards investments that can generate results with a short period. That means we will not see investments by IOCs in large and difficult projects that would produce results over a very long period. It will result in investments in the Middle East's oil, which is easier and faster to produce than most other types of oil. Many Middle Eastern countries are now in dire need to increase their production capacity because they are coming out of war and sanctions, like Libya, Iraq and Iran. As soon as there is some stability there, we will see them investing because they need the oil revenues.

5. Do you think the relative weight of NOCs is likely to increase over time, since their long-term investments have less decreased than IOC's capex over the last years?

I believe so. This is dictated by the fact that the type of oil reserves available in most NOCs' countries, especially in the Middle East, can produce results over a relatively shorter period than what IOCs can. We will see more and more IOCs investing as partner or as service provider working in countries like Libya, Iraq, Nigeria, and even the Gulf countries. In the 1970s, IOCs moved away from OPEC countries towards the North Sea, and then Latin America in the 1990s. I think those days are not with us anymore, because this trend resulted in the reduction of investments. Besides, if IOCs look long term, they must be concerned about the challenges to oil in general, from the advances in mobility and transportation, whether it is electric vehicles with cheaper battery technologies, driverless cars or any other innovation in transportation services. IOCs see a challenge in the long term for demand growth, and since their type of investment outside of easy oil countries may take much longer, they would rather make this investment within easy oil countries in collaboration with NOCs. Today, we can see somewhat of a partnership forming between the IOCs and the NOCs in the Middle East.

Evolution of the energy mix

6. In your view, what are the main breakthrough in terms of development of non-fossil fuels? With solar and wind energy reaching competitive prices, what are the implications for oil-rich producing countries, and in particular the GCC region?

It is a complex question, and many factors influence the answer. On one hand, renewables, like solar and wind, have

become almost conventional, much more than other new energy technologies. In many countries, solar and wind are now the standard for investing in additional power capacity. This is because prices came down rapidly; thus, it is now quite competitive. It is also because the risks associated are less in relation to construction delays, cost of overruns and pure price fluctuations. I think this trend, which is global, is already taking shape in the Gulf and OPEC countries. Obviously, the rate of growth in the GCC is well below what we have seen in other regions, but the plans are there. We see evidence of this trend in Saudi Arabia, the Emirates, Kuwait, Qatar, and Bahrain, at varying degrees.

The question is, what is the impact of such investments in domestic renewables or alternative power? There are two schools of thought here. One school of thought is wondering what we are going to do with the huge oil and gas reserves we have if we build power plants based on non-fossil fuels, especially if projections are heading towards less demand growth and possibly a decline in demand growth. The other school of thought has a different perception. First, it does not believe that oil demand growth is likely to go negative or even flatten. Growth may slow down, but it is not going to be zero or negative for a long time to come, i.e., 30 to 40 years. On the contrary, that school of thought considers that any barrel of oil or equivalent gas saved in domestic power stations by building renewables can be sold later or turned into valuable chemicals or petrochemicals. This is why we see huge investments in petrochemicals beginning to take place in the Gulf countries. In my view, the overall balance between these two schools of thought is favoring the second one: there does not seem to be a contradiction between investing in renewables within the country and its impact on demand growth or price of oil. Obviously, nobody can come up with a definitive final answer extending to 30 or 40 years ahead. But this is the order of magnitude of the time period before oil demand actually decreases.

We will continue to see robust growth in renewable projects in the GCC countries. We are essentially started from zero, and most of the Gulf countries do not have any sizable capacity of renewables. It may not be at the annual growth rate of 20 percent or 30 percent, or even 50 percent, like we have seen in some Arab countries, but it is not going to be a 2–3 percent growth either. It will certainly grow more than the conventional oil. Most of the Gulf countries do not have any renewables. Europe and America, on the other hand, started with a base of around 7 percent conventional renewable like hydro, unlike this part of the world (Middle East). All of our renewables are new renewables. It took 10 to 20 years for renewable to really start to make an impact at the level of 1 percent to 2 percent to 5 percent, and then 10 percent, of the American, European and Japanese markets. Hence, the same pattern and time horizon is expected before we do it in this part of the world.

The one uncertainty that tips the balance one way or another between the two schools of thought is the alternative technologies in the transportation sector. Many people talk about it as disruptive technological development. While the trend is unmistakable, the timing and the pace towards higher penetration remains very uncertain.

7. In the GCC countries, the weight of individual car is prevailing among transportation means. What could be the impact of transportation technologies, disruptive services, both on civil society and on oil revenues for GCC oil-rich countries?

I think worldwide there is no doubt that policies in the transportation sector look forward to an increasing share coming from non-oil. It used to be that the transportation sector was captive to oil, not just to fossil fuels. Technological development in batteries could result in a major change in terms of the energy mix that fuels the transportation sector. As I said, it is not just the electric vehicles and the batteries, but also the softer side, that is, the transportation services and the technological breakthroughs, like driverless cars.

Yet, as I mentioned earlier, the pace of the penetration and maturities of these technologies is quite uncertain. You have the optimists and the pessimists, even though the trend is there. Even the pessimists – if one looks at the recent OPEC report on this topic – do not say it is not happening in their scenarios, but they indicate that it is happening at a much slower pace than what the IEA and what the others are saying. Almost everybody believes that there will be a sizable market penetration of electric vehicles, especially assisted with the breakthroughs in batteries, and that this trend will have major impact. In countries like China and India, the bulk of younger generation that will enter the market of car ownership is expected to come over in the next 20 years or so. Will they drive electric vehicles or oil-based cars, or use Uber-like driverless car services? Anybody who says, “I know the answer to that” is exaggerating a bit. All we can say is that the trend is there; we are moving in that direction, and that we will see a growth in electric vehicles. The growth, however, can be high or modest.

The same applies to the driverless cars, where the optimists say this will take three to five years to see things turn around. On the other hand, pessimists indicate that even if the technology is there, to replace the current fleet will take another 10 to 20 years, at the very least. It is a very uncertain ground, but certainly, the demand growth for oil will be impacted. Is it sufficient to generate a demand peak in the next 10 years? Probably not. The earliest is probably 20 to 30 years. The system inertia is large. Currently, you could grow electric vehicles by 10–20 percent a year without seeing a perceptible impact on the demand for oil because we are starting from essentially zero. In 10 to 20 years, you will begin to see more of an impact. Whether that impact will lead to a demand peak in 10, 20 or

40 years is the big uncertainty. My view is that it is less likely that the demand peak – as a result of these technological breakthroughs like batteries, driverless cars and car services – will materialize in the 10 years, but rather than in 20 to 40 years. I think you will see among the experts that opinions vary; some people say 3–5 years, but I am skeptical.

8. Apart from solar and wind, what else can be expected in terms of development of non-fossil fuel with a material impact on the energy mix? In particular, what are your views on the evolution of hydrogen?

I have been hearing about hydrogen for about 30 to 40 years. I would say hydrogen is more like nuclear fusion: it holds great promise, but it does suffer from a number of challenges. There have been cycles of optimism and pessimism, and it is very difficult at this point in time to say whether the current cycle of optimism will survive another series of challenges.

This issue with hydrogen is that it is not mined; you have to produce it from fossil fuels or water. Either you break down water or you can use fossil fuels to produce hydrogen. If you can do it from water, then it can be combined with nuclear or solar power, and stored. However, there are a number of technological problems and safety issues related to the technology, and it also dictates infrastructure related to the fuel stations and fuel distributions.

Now hydrogen promise is being built a lot in conjunction with fuel cells for the transportation sector. I remember in the early part in this millennium, we were promised that in 10 years, that there will be a huge penetration of hydrogen fuel cell driven cars, and we have not seen that. There have been many venture capital investments on this front to support various concepts, but none have materialized in technological products that has any sizable penetration yet. The advancement of technology and technological developments, more recently, has generated a cycle of optimism in current years. We cannot dismiss hydrogen, but if you go by history, you have to be somewhat skeptical about the potential that this will be the silver bullet. Of course, no technology will be, by itself, a silver bullet by itself. We will end up having combination.

9. Does nuclear energy still have a future? A few years after Fukushima and Germany's withdrawal, UK's new birth of nuclear... what is the long-term trend for nuclear?

There will always be a market for nuclear energy, especially new nuclear, mainly in newcomer or developing countries, like China and India, for a variety of reasons. The main one being that nuclear provides a compact source for energy baseload. The challenges that are facing the development of nuclear energy in OECD countries are very different than in the non-OECD countries.

The issue of safety has become the major challenge, and its impact in Europe and North America has been huge. Despite

nuclear being climate-change friendly, it is not on the table in most OECD countries, with a few exceptions, such as the UK. There is always this fear of something you cannot touch or feel, in this case, the radiations, and the images of Fukushima and Chernobyl turning into mushroom clouds – that impacts the perception of nuclear power. There has been so much exaggeration about the potential impact of nuclear energy that it has become a rally point against it in OECD countries. The difference between advanced countries and developing countries is that the regulatory regime, coupled with the sensitivity of the public, is becoming so stifling that it is delaying significantly the construction time. What happens in Finland or in France with the French EPR, who is supposed to be a technological marvel, illustrates these delays. Costs have escalated more than twice, and construction years have tripled. Delays and overruns are a combination of the regulation, the responses to public opinion, and to past nuclear accidents, such as Fukushima and Chernobyl.

It is becoming almost impossible to undertake large nuclear projects without government guarantees. No government has stepped in, with the exception of UK project, where the government has guaranteed the project through the utility rate. In the US, the construction of nuclear power plant in the State of Georgia was paused and on the verge of being abandoned because of cost escalation. The State stepped in and forced the utility to recover the cost escalation from the rate payers, so that gave that project life for the time being. In general, the climate for large-scale nuclear power plants in OECD countries is not friendly. More recently, reports indicate that the Trump Administration, through the DOE, will forcibly instruct power dispatchers to buy power from nuclear and coal plants that are facing the risk of declaring bankruptcies.

One could ask whether this is a rational decision or not that led to this situation. The German reaction after Fukushima was exaggerated and, to some extent, was politically motivated. Everybody knows Chancellor Merkel won the first election by promising to cancel the phase-out of nuclear. When she faced the second election, she had to make alliances with the Green Party and was facing anti-nuclear public opinion. The public was willing to support the government in this new anti-nuclear power policy for decades. Germans are ready to pay high price for electricity, and are currently paying the highest amount amongst European countries (and probably in OECD countries). That allowed this Energiewende doctrine to appear not only to be successful, but also to be the one that voluntarily pays the tax in order to allow renewables or exclusively renewable expansion to proceed in other countries. On the other hand, we know that the CO₂ emission of Germany has increased because the replacement of the nuclear power has often been coal.

Newcomer countries see nuclear power as a way to become a technologically advanced country, and a worthwhile investment because of the complexity of the system. Some countries, of

course, see beyond technology; they view nuclear as giving them the know-how necessary to understand what others are doing, and maybe, if necessary, to do what others are doing. For example, Crown Prince Mohammed Bin Salman recently expressed that if Iranians resume pursuing their nuclear weapons program, Saudi Arabia will pursue them too. You cannot pursue nuclear weapons if you do not have the peaceful nuclear power program to build know-how capacity. It is a dual track. Iran had a peaceful nuclear power program which was the disguise for their hidden program that was uncovered in 2003, aimed at producing enriched uranium to be used easily, either to fuel nuclear power reactors or in nuclear weapons. If you go above 3 percent or 5 percent enrichment – they went to 20 percent enrichment – that knowledge provides you with the route to pursue nuclear weapons. For that reason, many newcomer countries may be thinking of nuclear power in the future, though this only applies to large countries. The Emirates, for example, is not considering this approach because they have announced a very transparent program and have accepted very strict conditions from the US and others. They gave up their right for enrichment, under NPT, to demonstrate their peaceful intent.

In the developing countries, the business obstacles we see in OECD countries against nuclear are not there. The Emirates project was executed with the completion of the construction of the first reactor, delayed by only a few months, and more or less at cost. In China, nuclear plants constructed are all within time and budget. The Russians, more or less, guarantee that their export reactors be will delivered on time, on cost, and that they are even financing them. issues, such as cost escalation, excessive regulation and the anti-nuclear public opinion, is not there. That is why we will see more growth in nuclear power in developing countries, such as China, India, even in Latin America, and similarly in the Middle East, in comparison to European countries, where you will hardly see growth. The only exception is the UK government. Possibly, the Trump Administration will reconsider nuclear, as has been reported in the press recently, but at the state level it is not working except in New York and Georgia.

The future of nuclear power will depend to a large extent on what is happening in the current construction programs: will they prove to be safe, as these generation 3 reactors are supposed to be much safer than the ones they are replacing? So, it will depend in 10 to 20 years from now what happens to these reactors. Would they fulfil their promise that they are inherently safe, such that if there is an accident they will shut and cool themselves automatically, without the need for human intervention?

The other factor is what will happen to the small modular reactors' (SMRs') nuclear power technologies; that is under consideration by many countries. There are over 40 designs that are being pursued. Some of them are at a very advanced stage, and some are even at the prototypes stage, being built in China

and few other countries. A potential advantage of these SMRs is that the financial risk is much less because their size is small. They are modular, which means they are usually constructed in a factory, allowing more control over the quality. They are also easier to build and ship, like building cars. Again, the proof is in the pudding. None are on the market yet, and we do not know which of the 40 to 50 different types of designs will win. All of them claim that they are inherently safer.

In the next 10 to 20 years, we will see two things happening on the part of large water reactors that are currently being built. First, we will see the performance of the third-generation reactors being built in China, India, other many developing countries, and possibly one or two industrial countries like France and England. Second, we will see what will happen on the SMRs front, which can be built within 2–3 years and are easier to accept on our grid, because we can order them to produce 100 megawatts, 200 megawatts or 50 megawatts, depending on the needs.

The black horse here is what happens to nuclear fusion. Since the 1970s, it has always been in the “next 30 years.” We keep hearing that it will solve all of the problems and will become commercial. Recently, some MIT scientists said that they now have a breakthrough, and it will be ready within 15 years. Again, it remains to be seen. I am a bit skeptical, but I continue to keep an open mind about it. It is a different ball game, because if fusion happens, we will see a resurgence of nuclear because it is essentially radioactive clean.

Evolution of NOCs in the Middle East

10. What is the impact of energy transition on NOCs?

Some are extending their activities to downstream and petrochemicals, some seek to develop solar energy... IOCs claims they are becoming energy companies. Do you think NOCs in the Gulf will follow the same trend, or will governments establish new companies for renewables different from the oil companies?

I think GCC governments should create new companies for renewables, rather than developing renewable energies through the existing O&G NOCs. Partnerships are being established between the national oil companies and these entities dedicated to renewables.

KSA is a good example: they have established a major entity, KACARE, for nuclear and renewables, but in close consultation with Aramco. Aramco embraced renewable as an investment for their power plant and their own operations. The same applies to Kuwait. KPC announced that they would build a power plant of about 1,200 megawatts to support their own operations as a part of the national plan that is led by KISR and the ministry of electricity. KISR is given the lead in the development of renewables. We will see if this type of partnership is becoming the mode, which is different from the IOC mode.

In my view, the NOCs are so important for their countries' economy that they need to stay focused on oil and gas as a primary preoccupation. Renewables, for them, is added as a partnership and collaboration, but not as a strategy of replacement to move away from oil, as BP was thinking or advertising on, trying to position itself as if renewables would replace oil soon.

NOCs' mandate is to make sure that oil stays in demand, and that they continue to produce it, process it, and sell it as a clean and attractive fuel. For example, Aramco has invested heavily in improving the efficiency of internal combustion engine in partnership with research centers and partners in Europe and North America. The idea is that if you can produce more efficient internal combustion engines, you can make it more challenging for electric vehicle, battery based to compete with internal combustion engine. You reduce the demand for oil per mile driven, but you certainly guarantee that it is still in demand rather than being replaced completely by renewables generating electricity stored in electric battery.

Another good example of the NOCs' responses to make the demand of oil last longer is petrochemicals and carbon capture. Aramco and other NOCs invest in carbon capture and storage (CCS). I am an advocate of oil companies investing in carbon capture (even capture in the atmosphere), storing it underground and then putting a stamp on each exported barrel, stating that "this barrel of oil has been compensated at the source of extraction by capturing and sequestering an equivalent amount of CO₂ content," so that it is essentially a zero-emission barrel of oil. I think this is a vision to develop. When you talked about carbon capture 30 years ago, people said you were a dreamer. Today, it is becoming a reality, maybe not immediately, but the trend is there. National oil companies' job is to invest in technologies to make demand for cleaner oil sustainable, i.e., oil that produces less CO₂ per mile driven or flew, whether it is through improved internal combustion engine, carbon capture equivalent to the emission. That is the primary job of an NOC, and it should not be their preoccupation to move to renewables as the primary one, though their country should move to renewables.

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Arthur D. Little

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