OPEC Defeated By US Shale Oil?

WASHINGTON – It seems that American shale oil producers, an assorted group of small and medium-sized firms which gained strength in the last decade and are now operating in many states, have become the swing producers in a position to influence global oil prices. How did that happen?

Cutting costs

U.S. shale oil production is relatively new. At the beginning of the "shale revolution" the cost of extracting oil from shale formations was quite high. But now they have come down significantly, mostly because of aggressive cost cutting measures adopted in response to OPEC imposed low prices. (More on this below). On account of this incredibly fast makeover, today a large number of the shale companies, especially those operating in West Texas, are profitable even with oil well below $ 50 per barrel.

Most interestingly, shale oil producers now have the ability to ramp production up and down with relative ease, this way adjusting to global market conditions, without causing major disruptions to their operations. They can increase output when prices are higher and cut back when prices are too low. Conventional oil producers do not have this option.

With crude around $ 50 per barrel, it is good news to have a substantial number of U.S. based oil producers supplying the domestic market, while making a profit even in this new era of low prices. This is a big plus for the American energy sector, and for all American consumers of energy products.

OPEC reactions

With good cause, OPEC saw the spectacular increase of U.S.

production caused by the large scale exploitation of abundant shale oil reserves (an additional 4 million barrels a day in just a few years) as a threat to its market dominance.

Hence a very simple strategy aimed at eliminating the American shale oil threat. The plan was to deliberately over produce, this way causing a global glut and consequently falling oil prices. The bet was that a long stretch of low prices would kill the U.S. high cost shale newcomers who –according to all analysts– could not survive with oil below $ 60 per barrel.

After having eliminated the U.S. menace, OPEC would go back to business as usual, reaffirming its position as the oil cartel which alone has the power to dictate prices by manipulating supply.

The strategy failed

But it did not work out this way. Not by a long shot. And this is because the U.S. shale producers, surprising everybody, managed to quickly adopt major technological improvements which increased well productivity, while aggressively cutting other production costs, this way staying profitable even with oil below $ 50 per barrel.

All in all, the Saudi/OPEC plan failed. While several marginal U.S. shale producers could not make the adjustments fast enough and went bankrupt, most of the shale sector survived the OPEC imposed squeeze on profits.

The high cost of low prices

In the meantime, the extended period of low prices hurt OPEC producers very badly. They saw their precious oil based revenue dwindle rather dramatically. It soon became clear that most OPEC countries could not sustain an extended period of low prices.

Therefore, led by Saudi Arabia, the OPEC cartel, (this time

working in concert with non OPEC Russia), tried to change strategy and jack up prices by cutting production, this way eliminating the oil glut they had created.

But this new approach is also failing. As oil prices go up on account of OPEC/Russia production cuts, the U.S. shale companies ramped up production, this way offsetting the OPEC/Russia cuts. As OPEC imposes cuts on its members, the U.S. shale sector produces more, while Saudi Arabia is denied the revenue gains that should have resulted from production cuts. So, the OPEC strategy aimed at eliminating the U.S. shale threat to its market dominance did not work.

Loss of precious revenue

That said, the sustained "attack" against US shale has been horribly expensive for the OPEC cartel members. Years of low prices hurt major Middle Eastern oil producers, (not to mention Nigeria and Venezuela, and non OPEC Russia, among others), in a significant way.

Most of these countries rely heavily on oil revenues to finance all or most public spending. Many of them had adopted national spending programs and budgets which assumed oil prices at $ 90, or $ 80 per barrel.

This means that all of them are facing fiscal problems or outright crises. Lacking oil revenue in the expected amounts, they have to cut spending and borrow more in international financial markets. But this is not an easy adjustment.

For example, in Saudi Arabia major spending cuts caused by declining oil revenue could lead to unprecedented political problems down the line. Almost the entire Saudi population depends one way or the other on direct or indirect government subsidies funded entirely via the oil revenue.

Reforms will take time

We know that the Saudi Monarchy is now openly committed to a major economic and fiscal transformation which will (hopefully) reduce and eventually eliminate all state subsidies, while promoting plans aimed at diversifying the economy. But, even in the best of circumstances, this is going to be a long journey. Cutting government largesse too much too soon could be politically dangerous.

Bottom line; U.S. shale wins; OPEC cartel and its new allies lose.

Trump Takes U.S. Out of Paris Accord on Climate

WASHINGTON – U.S. coal miners and out of work factory workers: this is for you! President Donald Trump publicly announced that the U.S. will withdraw from the Paris Climate Accord that his Democratic predecessor, Barack Obama, promoted and warmly endorsed. Trump's argument against the Paris deal is that it will penalize the American coal mining industry, and the overall American economy in the short term, with only vague hopes of somewhat lower world temperatures, way down the line.

Bad deal for America

As Trump sees it, this is a bad deal for America; and so the right thing is to get out of it. Sticking to the obligations created by the Accord would amount to enacting the equivalent of a huge energy tax on the US economy, because compliance

with new, strict emission controls (in order to limit the amounts of greenhouse gases released into the atmosphere) will be very expensive.

As a candidate, Trump promised that he would withdraw from this climate deal, and now that he is President he is doing it. We know that his close advisers are divided on this issue. His daughter Ivanka and son in law Jared Kushner, along with Secretary of State Rex Tillerson, recommended not withdrawing. Still, in the end Trump sides with the opponents.

What does this mean?

That said, from a practical standpoint, America's exit, at least in the short term, will not amount to any worsening of the global climate. Indeed, the Paris Accord, if all goes well, promises only modest progress on lowering the temperature of the world, and only after many years. And this will happen only if we assume that all the other participants will actually do what they promised to do in terms of enacting new policies aimed at lowering their consumption of fossil fuels, this way reducing greenhouse gases emissions. Do keep in mind that the Paris Accord has no enforcement mechanism. The commitments made by the signatories are purely voluntary. In the case of China, the world's biggest polluter, Beijing is theoretically bound to implement new policies several years from now.

Political consequences

Still, Trump's decision on this rather emotional issue has had immediate political consequences. From the stand point of other nations, particularly the leaders of the G 7 Trump just met in Taormina, Italy, this amounts to America choosing to go it alone, openly dissenting from a global consensus on the global threats to the earth created by the unrestrained consumption of fossil fuels.

U.S. no longer leading

In the short and medium term, this means that America is no longer leading the world on a critical policy issue, As most world leaders see it, America has now retreated in its narrow universe characterized by a bizarre anti-science fixation pursued by a strange president who is “anti everything”.

Anti-everything Trump

Indeed, Trump is so anti-immigrant and xenophobic that he wants to build a wall along the entire border with Mexico.

Furthermore, according to the now widely accepted narrative, this is a president who is openly against free trade, against the EU, against NATO, and against Muslims, (sort of). Given all this, Trump being also against joint international efforts aimed at stopping and hopefully reversing climate change is disappointing; but not surprising. This new development fits the now accepted narrative.

America is no longer leading. Trump’s America has retreated behind a myopic worldview of narrow self-interest.

From the standpoint of old friends and allies, Trump’s announcement on exiting the Paris Accord is yet another (sad) sign that America is no longer the “Leader of the free World”.

In fact, even before this new development on the Paris Accord, German Chancellor Angela Merkel had already publicly argued that it is time for Europe to think of and plan for a future without close ties to the U.S., since Trump’s America is no longer a reliable friend.

Political symbolism

Again, keep in mind that all this is mostly about political symbolism. It will take four years for America to fully extricate itself from the obligations contracted under the Paris Accord. This is fairly long time. And again, keep in mind that under the terms of this Paris deal, major polluters

like China and India have modest obligations when it comes to reducing their own emissions that will kick in much later. Which is to say that you should not expect world temperatures to start rising tomorrow, simply because today President Trump announced that America will pull out in four years.

No gain

However, as indicated above, this decision is not without political consequences. In the end, all this is will amount to an additional loss of international prestige for Trump's America.

With all this in mind, whatever you may think about the intrinsic policy value of the Paris Accord, it would have been better for Washington to be part of it, as opposed to becoming now a big pariah in the eyes of the world.

Trump is talking to his base

Well, then why did he do it? Very simple.

Trump's narrow concern here is to reassure his domestic political base –the millions of Americans who voted for him last November. This base includes out of work coal miners and people displaced by the closure of old manufacturing plants.

Trump's message to them is that his job is to revive the American economy. If this means heavy reliance on dirty energy, so be it. Out of work factory workers want money to pay their bills. They do not care about the fate of polar bears or about extreme weather phenomena in Africa. And they do not care about rising sea levels.

Finally, dire scenarios of New York City and Miami under water in just a few years (because of the rapid melting of the Polar Caps) are definitely a hoax –at least according to Trump and his supporters.

Facing Low Oil Prices Exxon Is Looking For New Strategies

WASHINGTON – Major oil companies are in deep trouble. Too much global supply means lower crude prices. If this continues –and there is every little evidence that it will not– this means that large exploration projects in far away lands that typically require large up front investments may no longer have economic justifications. Simply stated, these projects mean too much money invested now for potentially weak or even negative returns years from now.

Move into shale

Hence the decision just announced by the new Exxon leadership to invest more in the U.S. shale oil sector. This move would require lower up front capital investments, as opposed to the traditional focus huge on large "conventional oil" exploration ventures, many of them off shore operations, which may cost billions over a number of years before they become operational. It is hoped that this move into U.S. shale would create greater operational flexibility, since shale wells do not cost that much and can be "turned on or off" fairly quickly, depending on global demand and supply fluctuation.

This is how *Oil & Energy Insider* (March 3, 2017) describes the move:

"Exxon goes big on U.S. shale. *New* ***ExxonMobil (NYSE: XOM)*** *CEO Darren Woods gave his first presentation to investors this week, where he outlined a strategy to step up investment in U.S. shale. Exxon will allocate a quarter of its 2017 budget to short-cycle shale projects. The move will help the oil major navigate an uncertain market, as cash can be returned to*

the company much quicker from shale drilling than it can from the major offshore projects that Exxon has long been accustomed to. Still, Exxon will move forward aggressively on its large offshore discovery in Guyana, hoping to bring it online in the next few years. "

Diversify

So, here is the thing. Exxon is trying to diversify its energy portfolio. It will continue work on existing "conventional oil" projects. But it will try to mitigate the risks associated with large commitments to new expensive projects in a volatile and downward trending crude prices environment by buying more into the less risky U.S. shale sector.

I say smart move. However, it may just not be enough. In part thanks to the U.S. shale oil revolutions that began in earnest about a decade ago, there is just too much crude supply world-wide.

It may not work

Hard to believe that OPEC's oil price support efforts –its decision to cut production, somewhat– even if aided by similar production cuts enacted by Russia and other non-OPEC producers, will manage to put a real floor on oil prices.

Good luck to Exxon. It really needs it in order to protect its position as an American oil giant.

China To Become Green Super

Power?

WASHINGTON – Many Western environmentalists and commentators openly praise China for its declared energy policy objective of turning itself into a truly *"Green Super Power"*. They claim that, unlike Trump's America, (ignorant and backward), China (smart and forward-looking) truly understands the threat of global warming, and is actually doing something very serious about it.

Hundreds of billions for green power projects

Indeed China has committed hundreds of billions of dollars to renewable energy projects. It is leading the world in massive investments in wind and solar projects, with more to come.

Contrast that with heretic America now led by a President who believes and publicly affirms that global warming is nothing but a hoax. Indeed, instead of leading the way in renewable energy investments, President Trump's America promises to revive (dirty, high emissions) coal production, while he just signed executive orders that will re-start two major oil pipeline projects that had been blocked by President Barack Obama, at least in part because of environmental concerns.

Responsible China

So, there you go. Communist China's leaders are acting as responsible stewards of our Planet Earth, while democratic America is the prisoner of anti-science bizarre bigotry that ignores "the facts" about green house gases and global warming, and the dire consequences of disastrous energy policies still based on fossil fuels that will end up cooking the world.

The truth is more complicated

Well, this is how the critics of American policies would like

to frame the argument. But the truth is far more complex. It is indeed true that China is investing very substantial amounts in green energy projects. But it is also true that renewables are and will continue to be a small fraction of China's power generation capacity. The fact is that China relies today and will continue to rely in the future mostly on coal –yes, old-fashioned dirty coal– to produce about 66% of its electricity.

In contrast, if you look at the current mix, U.S. electricity generation is on balance far greener.

Green America?

In the U.S. coal is now used for only 33% of power generation, a much lower proportion than China's, (50% less, in fact). On account of the shale gas revolution that made natural gas abundant and cheap, America now relies on low emissions natural gas for 33% of electrical generation capacity. This percentage is destined to increase, mostly at the expense of dirty coal. While this transformation is driven by market factors, as opposed to government green policies, the added bonus here is that natural gas is a much more environmentally friendly fossil fuel.

If you add 20% of power generation produced by nuclear and 6% from hydro, (an old-fashioned source of renewable energy), the picture is not that disastrous.

Less coal, more natural gas

While the contribution from other renewables is still rather small in America –solar represents only 0.6% of total power generation capacity, while wind is a still a modest 4.7%– the fact remains that America relies on coal for only 33% of its power generation, while China uses this dirty fuel for almost 70% of its total electricity generation.

So, looking at the numbers, (to date at least), America is far

greener than China.

The truth is that coal-fired plants are and will continue to be for years to come the major electricity producers in China. Even at current levels of new investments in renewables, it will be a long time before China becomes green in a meaningful sense.

Biomass

In the meantime, if we break down China's renewable energy mix, we see that (if we exclude hydro) by far the biggest percentage is represented by biomass. As noted by Bjorn Lomborg in a recent op-ed piece published in The Wall Street Journal (*A "Green Leap Forward" in China? What a Load of Biomass*, February 5, 2017):

"It is peculiar—though unsurprising given the sensibilities of Western environmentalists—that those who celebrate China's "Green Leap Forward" almost always focus on wind and solar technology. By far the largest source of renewable energy used in China is traditional biomass—that is, people burning charcoal, firewood and dung, as China's poor do to stay warm. Biomass is the biggest source of killer air pollution in the world."

Health concerns

As biomass energy production entails burning animal dung, wood and charcoal, this type of fuel is hardly green, because of the fumes and soot produced by its combustion. If you consider that in China biomass is used for home heating and cooking mostly by the rural poor, this means that the fumes released by these "green fuels" cause a variety of respiratory diseases to vulnerable, low income people.

It will take a long time

So, what is really going on here? It is true that China is

committed to increasing the percentage of its electricity generation provided by clean solar and wind. In absolute numbers, China's renewable generation added capacity is truly impressive. However, as a percentage of the total (keep in mind that China has a population of 1.3 billion energy users), this contribution from renewables is and will continue to be rather modest.

Still reliant on coal

The fact is that major efforts in wind and solar notwithstanding, China still relies and will continue to rely on traditional dirty coal as the key component of its power generation mix for many years. In fact, while wind farms are built, China is adding more coal-fired generation.

It is therefore a misrepresentation to state that China is well on its way to becoming a "Green Super Power". While the intention may be there, it will be a long time before China will be able to rely mostly on renewables for its power generation needs.

Let the markets decide

The larger lesson here is that in the end it will be superior technology delivered at competitive prices that will tilt the power generation balance. When renewables will be really cost competitive without subsidies, then they will be adopted on a massive scale in China, in America and elsewhere.

Right now, at least in the West, the push for early adoption of still expensive technologies is not driven primarily by economic considerations. It is pushed forward by policy-makers through mandates, set asides and tax breaks created because of strong environmental concerns.

While this is understandable, we should not muddy the waters by arguing that if China can go all the way with renewables, so should America. China is doing something important. But, on

close inspection, a lot less than what is stated by Western environmentalists.

Oil Prices Will Go Down But U.S. Shale Will Survive

WASHINGTON – After the oil production cuts recently announced first by OPEC and then non OPEC oil producers, oil prices rallied. This is because supply cuts must mean tighter markets and therefore higher prices. Well, looking at what most energy sector analysts say, this idea of a sustained oil rally is a dream that will soon end. And this is because there are too many exemptions to these announced cuts, too many special cases and too many opportunities to cheat, since rather modest total production cuts are to be spread thinly among many producers.

Oil prices will fall again

Who is going to check about full compliance? Bottom line, expect oil prices to lose altitude again, as soon as hard data about production among OPEC and non OPEC countries will become known, probably towards the end of January. Keeping all this into account, while West Texas Intermediate, WTI, closed at about $ 53 on January 5, it is hard to believe that it will stay at that relatively high level for much longer.

What will happen to the U.S. shale sector?

That said, the really interesting question, assuming persistent low crude prices, is whether the U.S. shale oil industry will be able to withstand another prolonged price squeeze.

If recent history is good guidance, I would say: yes, it will. Surprising everybody, the American oil shale sector, until a few years ago deemed to be profitable only assuming oil would stay at or above $ 60 per barrel, managed to survive, when oil beginning in 2014 went down to $50, $ 40, and even $ 30 per barrel.

Of course, the success record is quite uneven within a sector characterized by so many diverse players that differ in terms of size, profitability of their reserves and financial conditions. Many shale energy company, especially those carrying quite a bit of debt, just could not make it. They went bankrupt. Others were bought by stronger competitors.

U.S. shale oil sector made up of diverse players

In truth, there is no such thing as a homogeneous U.S. shale oil sector. There are many energy companies operating in different states. Each one is different. And the chances to survive or thrive in a tough market environment because of low oil prices depend on many factors unevenly spread. Indeed, while examining companies, analysts have to take into account the specific geology that will affect production techniques and oil recovery levels and related costs, the company’s management skills, the amount of debt each company carries, the ability to apply in a timely manner state of the art new technologies, and a lot more.

Still, even taking to account that some companies are strong and some very weak, with many more in between, it is fair to say that the sector as a whole proved to be surprisingly resilient, given the low profit margins in a depressed oil price market.

Sustained production

Yes, the total U.S. rig count went down, dramatically, following the 2014 price collapse. But overall production, with some ups and downs, did not go down that much. The shale oil sector proved to be quite flexible.

While large conventional operations cannot be brought on line, closed and restarted at will, the shale sector is far more flexible. And this means that shale operators do not need to bet on a 5 year window of high prices that will guarantee profits in order to start operations.

They can quickly respond to price fluctuations, producing more when prices are high; while shutting down production when prices drop below their break even point. Look, obviously it is not just like flipping a light switch. But you get the idea. Shale is nimble.

How much flexibility and resilience?

So, flexibility and resilience define the American shale oil sector. But here is the question. Is it possible for U.S. shale to become ever more productive and nimble? Or, at some point, no matter how much they try to cut costs, the energy companies hit a profitability wall?

While we know that the shale plays in the Permian basin in Texas can stay in business even with oil at $ 40 or even $ 30 per barrel, what about all the other reserves in Oklahoma, North Dakota and other states? If we assume prices going down to $ 40 or even $ 30 per barrel for an extended period of time, how many shale companies, many of them operating in far less favorable locations, have a realistic chance to survive, let alone be profitable? Can new fracking technologies perform more miracles, or has the sector become as productive as it can get?

How long can Saudi Arabia endure the adverse impact of lower

oil revenue?

The honest answer is that we do not know. That said, we also do not know how long oil prices will stay this low. Indeed, we do not know how long Saudi Arabia, the world's biggest producer and OPEC's *de facto* leader, can endure the economic and fiscal impact of low prices without resorting to much steeper cuts in order to jack up prices and therefore state revenues.

We all know that Saudi Arabia's oil industry will be profitable even with oil at $ 30 per barrel, because Saudi extraction costs are very low. But the problem is that the Saudi Government depends on high oil prices to finance practically everything.

While the Monarchy is trying to change things, right now the Saudi State needs to lubricate with cash infusions a rent based society in which hardly any Saudi citizen is engaged in truly productive activities.

Low oil prices hurt

Which is to say that low oil prices hurt different producers in different ways. OPEC now has tried to drive prices up by announcing relatively modest production cuts to be spread among various producers. Some non OPEC countries indicated that they would also participate, with the shared objective of jacking up prices.

Based on what know, this time the trick probably will not work, because too many producers are saying one thing about cuts and then planning to do the opposite (keep production levels high, or in some cases, ramp up production).

When will Saudi Arabia announce serious cuts?

But at some point Saudi Arabia will start running out of cash; and so it will have to cut its oil production in order to

drive prices up. This would help the Saudi state immensely in its effort to stabilize its finances. However, any Saudi move aimed at supporting oil prices would also help the marginal U.S. shale producers. Some of them are hanging tight, hoping for better days to come.

In other words, who will give up first? Will the U.S. shale sector be eventually defeated by prolonged low oil prices? Or will Saudi Arabia have to swallow the bitter pill and cut production (therefore giving up some of its market share) in a far more significant way in order to drive prices up, with full knowledge that this will help U.S. shale companies?

Bet on Yankee ingenuity

All in all, when it comes to endurance and resilience in adverse market conditions, I would still bet on Yankee ingenuity. The American shale oil industry surprised the world by inventing and then deploying hydraulic fracturing (fracking) and horizontal drilling on a large scale, this way bringing on line millions of barrels of oil that was deemed to be unrecoverable. And then they delivered an even bigger surprise when they managed to make the entire sector much more productive and efficient in record time, when faced with a sudden crude oil price collapse.

None of this could be done, everybody said. And the shale oil people did it. May be they will keep doing it, surprising all analysts once again.

Mass Produced Electric Cars?

Sooner Than You Think

WASHINGTON – The still unresolved issue that will determine if and when there will be real mass demand for Electric Vehicles, EVs, is how to design and manufacture cheaper, lighter batteries for EVs with a higher energy reservoir, and therefore capable of traveling longer distances with one electric charge.

Getting there

The optimists tell us that we are getting there. They cite significant technological innovations and dramatic cost reductions already achieved in the past few years. All true. Batteries are cheaper. EVs now can travel farther. And the optimists also tell us that new collaborative efforts now underway may help expedite additional progress in battery design and effectiveness.

Cheaper batteries, coming soon

Here is a good example. "*Cheaper, more powerful electric car batteries are on the horizon*." This headline appeared on ScienceDaily, 9 August 2016. The story is about a new joint effort linking the U.S. Department of Energy, several U.S. academic institutions and the private sector, under the leadership of a Binghamton University expert.

"*The White House* –Science Daily wrote– *recently announced the creation of the Battery500 Consortium, a multidisciplinary group led by the U.S. Department of Energy (DOE), Pacific Northwest National Laboratory (PNNL) working to reduce the cost of vehicle battery technologies. The Battery500 Consortium will receive an award of up to $10 million per year for five years to drive progress on DOE's goal of reducing the cost of vehicle battery technologies.*"

"*[Assuming success, this effort] will result in a*

significantly smaller, lighter weight, less expensive battery pack (below $100/kWh) and more affordable electric vehicles.

M. Stanley Whittingham, distinguished professor of chemistry at Binghamton University, will lead his Energy Storage team in the charge."

"We hope to extract as much energy as possible while, at the same time, producing a battery that is smaller and cheaper to produce," said Whittingham. "This consortium includes some of the brightest minds in the field, and I look forward to working with them to create lithium batteries that will power future electric vehicles more affordably."

According to the Science Daily story, other Battery500 Consortium members include:

- *Pacific Northwest National Laboratory*
- *Brookhaven National Laboratory*
- *Idaho National Laboratory*
- *SLAC National Accelerator Laboratory*
- *Stanford University*
- *University of California, San Diego*
- *University of Texas at Austin*
- *University of Washington*
- *IBM (advisory board member)*
- *Tesla Motors, Inc. (advisory board member)*

Breakthrough?

Well, is this an indication that we are on the verge of a major breakthrough when it comes to the most critical component of future generation EVs? Who knows, really.

Still, if I were the CEO of a major oil company, I would feel very nervous.

Never mind OPEC and its mixed signals regarding its willingness and ability to freeze/cut production in order to stabilize global oil prices. Never mind the ongoing tensions between political rivals Saudi Arabia and Iran and their potential impact on oil markets.

Oil will become obsolete

The real scary thought is that oil may soon become obsolete. Yes, you got it right: *"Oil may soon become obsolete".*

Of course this will not happen suddenly. And of course there will still be a significant need for many oil derived products other than gasoline for automobiles. (Think jet fuel, diesel for heavy trucks, oil for plastics and other petrochemical products, and a lot more).

Still, the fact is that on a global scale crude is used mostly to produce the gigantic rivers of oil-derived gasoline that end up in the tanks of hundreds of millions of cars powered by internal combustion engines. Tanks that need to be refilled very often with more and more gasoline.

End of the conventional car

If and when cheaper EVs powered by cost-effective new generation batteries hit the road, there will be a fairly rapid revolution. This will be the end of the conventional car powered by an internal combustion engine.

Indeed, an electric charge is much cheaper than filling your tank with gasoline. Much cheaper batteries, assuming some companies will manage to manufacture them relatively soon, will lower the price of future electric vehicles, while increasing the distance EVs can cover with one charge.

As soon as this happens, there will be a consumers-led

revolution. Millions of drivers across the world will quickly switch to EVs because they will be finally affordable, dependable, and much cheaper to operate, not to mention far cleaner than their gasoline powered counterparts. (By the way: not entirely clean. EVs run on electricity, a zero emission fuel. However, a significant percentage of electricity in the U.S. and elsewhere is produced by burning coal and natural gas. Which is to say that if you consider the source of their fuel, although emissions free, EVs are still not entirely "clean").

How soon?

That said, the big, open question for any oil executive is: *"How much time do we have left before the whole oil sector will collapse, due to lack of demand"?*

It is very clear that this revolutionary transformation brought about by mass-produced EVs will happen. But nobody knows when: 5 years? 10 Years? 15 Years?

And here is the big problem for the oil industry. In order to properly run their businesses, oil executives must plan ahead. And these plans entail major capital investments needed now in order to reap significant gains to be realized several years down the road in terms of new oil production coming on line.

Indeed, for oil companies to stay profitable, mature wells close to exhaustion need to be replaced by fresh production. And this means investing now, sometimes on a massive scale, in order to secure continuity of future oil production. This is how the industry works. Except that now this traditional approach is no longer a sure bet.

Given developments in EV battery technologies, today oil executives know that this cycle of investments-exploitation-new investments-future exploitation will no longer work indefinitely.

The end of oil companies as giant players

If and when EVs will become dominant because of technological and cost breakthroughs in batteries technology, this will signal the beginning of the end for major oil companies.

In the not so distant future, many of them will run the risk of being caught with new expensive projects half completed that all of a sudden are no longer economically viable on account of collapsing demand for their product –oil– once coveted, and now out of fashion.

Beyond these contingencies, because of EVs almost all oil companies will have to cut production, concentrating on the cheapest crude, in order to survive in a new energy era characterized by drastically diminished demand for oil and oil products. The weakest players will not be able to make it. They will go under, or they will be bought by bigger companies.

Oil will still be needed

Having said all this, will EVs amount to a final catastrophe for the oil sector? Not entirely. Let’s keep all this in perspective. Even assuming state of the art, cost-effective EVs quickly replacing an enormous global fleet of gasoline powered vehicles, there will still be demand for oil.

Heavy trucks and ships will continue to run on oil derived diesel fuel for many, many years. Likewise, thousands upon thousands of civilian and military airplanes will still rely on jet fuel made from crude oil. Petrochemical and plastics industries across the globe will continue to need oil derived products.

All this is true. However, assuming a fairly rapid switch to EVs, the global demand for oil, now driven largely by demand for oil derived gasoline, will collapse. All of a sudden, the global oil industry will face gigantic over capacity: too much

oil and too little demand. Only the ultra lean, low-cost operators with a solid financial base will survive.

Good bye Exxon?

Hard to think of a world in which Exxon Mobil will be a mid-sized company confined to producing oil for jet fuel and diesel trucks only, since millions of cars will run on electricity, and no longer on gasoline. But we are getting there. And this may happen sooner than we think. Call it the next "oil shock".

Round One: US Shale Wins, OPEC Loses

WASHINGTON – Here is the news. The US shale oil industry, while badly wounded by the price war waged by Saudi Arabia, is still standing and fighting on. In fact, it is now better than ever. Thanks to rapid technological innovation, it has been successfully re-engineered. Although bruised, it is slimmer, more productive and more efficient than ever.

Unsustainable low prices

Saudi Arabia instead may not be able to sustain its own scorched earth, low oil prices campaign; not because of its impact on Saudi oil profitability, (still very healthy); but because Saudi Arabia needs a much larger oil revenue to finance its budget and to continue subsidizing a population that looks at public money as an entitlement. Indeed, low oil prices for the indefinite future may jeopardize the very

survival of the Saudi state.

How it started

A couple of years ago, when oil prices started sliding due to a supply glut, Saudi Arabia announced that, contrary to expectations, it would not cut production in order to jack up crude prices. This was an unusual reaction, and all analysts wondered what prompted it.

In the past, OPEC's strategy had been to maintain price stability at a fairly highly level. Not too high so that it would financially damage buyers; but high enough in order to guarantee high margins for OPEC producers. That balance seemed to be with oil prices at around $ 100 per barrel. In order to achieve this goal, OPEC, led by Saudi Arabia, in order to support prices would cut production when supply exceeded global demand.

New policy

So, why the new course of action? Why would Saudi Arabia allow oil prices to slide? There were several theories. Saudi Arabia wanted to damage Iran. No, the Saudis were going after Russia, because they did not like its military support to Syria. ***But the most popular theory was that the Gulf oil giant wanted to kill its newest but possibly weakest competitor: the US shale oil industry.***

US shale

Indeed, thanks to the use of hydraulic fracturing (or fracking) the booming US shale oil industry had surprised the entire world. Using fracking to extract oil from shale formations, with incredible speed American shale oil producers had added millions of barrels of US production in just a few years, this way creating the global oil glut that caused the rapid crude price decline. This sudden change in global demand and supply obviously worried the Saudis, the established oil

markets arbiters.

Too expensive?

That said, just like almost everybody else in the oil business, the Saudis "knew" that extracting oil from shale is very expensive. The consensus was that US shale oil could be profitable only with crude well above $ 60 per barrel.

Yes, shale oil production via fracking is a fantastic innovation. But production costs are much higher than the industry average. Therefore, if you wanted to get rid of this US shale oil annoyance that caused a global supply glut, just drive the price of crude way down for a while by over supplying already saturated markets, and the the US shale oil producers would go bankrupt. As easy as that.

Make them go bankrupt

And for a while it seemed that the Saudi game plan (assuming that this is what they were really trying to do) was actually working. With oil going from $ 100 to $ 60 and then down to $ 40 a barrel, US shale oil companies' profits fell or disappeared altogether. The most indebted small and medium US producers could not get more financing. And so they went under. A large number of operations stopped.

It was a carnage. In just a couple of years, tens of thousands of shale oil industry jobs were lost. A very large number of vendors and suppliers to the shale oil sector suffered. Entire communities that catered to energy workers had to absorb major losses.

Surprise!

However, guess what, the huge body blow of declining oil prices that in no time had gone from $ 100 to $ 40 per barrel, or even lower, surprisingly did not kill the US shale oil industry.

To the amazement of all industry practitioners, the shale oil sector managed, in almost no time, to become more efficient and more productive. Costs were slashed, year after year. Oil recovery rates improved, quite substantially. Yes, as a consequence of falling prices, overall US oil production went from 9.7 million barrels a day down to 8.5 million; a net loss of 1.2 million. But the survivors are now nimble and profitable, even with oil below $ 50 per barrel. Many of them can still make money with oil at $ 40 per barrel.

Saudi Arabia now in trouble

Meanwhile, it looks as if Saudi Arabia cannot live much longer with the consequences of its own low crude prices policies. Let's make it clear. The Saudi oil industry is not in any trouble. It remains very profitable even at low prices, simply because Saudi oil extraction costs are very low.

However, the problem is that the Saudi government needs oil at $ 100 in order to finance its budgets, public investments plans, and a variety of subsidies offered to almost all Saudi citizens.

Out of cash

Sustained low oil prices caused a sudden state revenue shortfall. And this has created a huge fiscal problem. For the time being, Saudi Arabia can cope. It has used some of its vast currency reserves. It has issued bonds to finance its large and expanding budget deficit. So far, so good. But the outlook is not at all promising. Assuming low prices for the indefinite future, little by little Saudi Arabia will run out of cash.

Given all of the above, at some point OPEC, led by Saudi Arabia, will have to cut production in order to increase oil prices. This will increase Saudi state revenues and stabilize the Kingdom's fiscal situation.

Shale producers are more flexible

That said, this will also be good for US shale producers. Unlike other "conventional oil" producers, the US shale companies now have the technology that allows them to ramp up production relatively quickly, while cutting it when global supply is excessive. Which is to say that when prices go up more rigs will go into operation. When prices start sliding due to excessive supply, shale oil operators can shut down some operations, without going bankrupt in the process.

Shale wins

All in all, the plucky US shale upstarts, usually small companies sometimes poorly managed and not well-financed, managed to take huge blows, quickly reinvent themselves, and come back, stronger than before. This proves that disruptive technological innovation is possible –even in mature industries like oil. All in all, at the end of this oil price war round, shale wins, OPEC loses.

Is Exxon's Obfuscation About Climate Change A Crime?

WASHINGTON – Here is the thing. We know now that ExxonMobil's internal documents reveal that experts working for the company years ago admitted that burning fossil fuels would cause unwanted higher temperatures, and therefore climate change.

Deceit

Exxon’s top management was well aware of these findings. But quite obviously it chose to ignore them. In fact, it did much worse. The oil and gas conglomerate for years funded research organizations that either minimized the impact of fossil fuel emissions on temperature changes, or denied it altogether.

There is no question in my mind that Exxon knew exactly what it was doing. It was engaged in a big lie in order to protect its enormous economic interests. It fought against those who would want to drastically curb the use of fossil fuels, and therefore harm or kill its business, on the basis that burning fossil fuels increases CO2 levels in the atmosphere. There is no doubt that Exxon’s behavior is unethical and despicable.

Is this a crime?

But is it also criminal? Well, many U.S. public officials think so. Led by New York State Attorney General Eric Schneiderman, they maintain that Exxon’s actions are in fact ***fraud***. By denying evidence that it knew to be true about the harmful impact of its products, Exxon Mobil willfully cheated its investors.

They were told that the company was engaged in safe activities, while it turns out that they are unsafe, given the global warming impact derived from using the fossil fuels that Exxon produces. According to Schneiderman this behavior is very similar or equal to the pattern of conduct exhibited by the tobacco companies when for years they denied that nicotine was addictive and that smoking cigarettes greatly enhances health risks.

Just like the tobacco companies

The tobacco companies quite clearly knew the truth about the consequences of smoking. But they engaged in a massive disinformation campaign because they wanted to protect their market. If, by doing this, they allowed millions of Americans to die prematurely because of lung cancer and other cigarettes

caused diseases, so be it. They just did not care. In order to keep their immense profits, they kept obfuscating for as long as they could. Later on, this was considered criminal behavior. And so the tobacco companies were forced to pay enormous fines.

Well, Exxon's critics now say that the oil company did pretty much the same. The company withheld from its investors and from the American public the content of internal studies that acknowledged that global warming is the result of humans using fossil fuels on a massive scale, while publicly claiming that the data and the evidence supporting this thesis is ambiguous and inconclusive. Very simply, they knew the truth; but in public they declared the exact opposite.

It is not fraud

Anyway, is all this criminal? I do not think so. Most investors knew exactly what they were buying when they purchased ExxonMobil stocks. Even though Exxon was engaged in a robust disinformation campaign, people –including investors– had access to plenty of publicly available studies that clearly stated the opposite.

Which is to say that people who bought Exxon stock knew the facts. More broadly, it is clear that Americans keep using fossil fuels and their byproducts (gasoline) out of their own free will, notwithstanding the efforts of scores of NGOs and the Greens who on a daily basis warn everybody that this behavior will lead to planetary catastrophe.

In fact, even those who believe the green arguments against fossil fuels continue to use them simply because as of today there is no plausible, truly cost-effective alternative. Nobody forces the average American to drive a car powered by an internal combustion engine fueled by gasoline produced by Exxon or by any other energy company. But millions drive these vehicles simply because for most people there is no practical

alternative.

Immoral but not criminal

So, here is the thing. Exxon's behavior is clearly immoral and unethical. It had information that would have harmed its business and it chose not to disclose it, while pretending in its public statements that there was no conclusive evidence that burning oil products harms the environment. This is bad behavior.

But this behavior does not amount to fraud on a massive scale. Indeed, if people wanted "the facts" on the relationship between the use of fossil fuels and global warming, they were out there. There were and there are plenty of widely available sources that state the dangers.

It is completely disingenuous to affirm that the poor, innocent investors were duped into buying stocks of a company that makes harmful products only because ExxonMobil lied to them.

The Dream Of A Modern Saudi Arabia

WASHINGTON – Bloomberg Businessweek placed Saudi Arabia's Deputy Crown Prince Mohammed bin Salman on its cover (April 25 – May 1) underneath a caption that says he is *"preparing Saudi Arabia for the end of oil"*. The lengthy cover story is all about this energetic young Prince who –all alone– is determined to spearhead a series of bold initiatives and

reforms aimed at re-engineering a country whose vast richness come from gigantic oil revenues, and not the skills of its citizens. Of course, being the son of the King helps a bit in what is still a top-down, absolute monarchy.

Plan to diversify the economy

The long article explains how the Deputy Crown Prince plans to diversify the economy. He wants to start selling shares of Saudi Aramco, probably the single largest oil company in the world. He would then invest the proceeds in a number of global companies. After this diversification, in the future Saudi Arabia's economic fortunes will be less tied to the ups and downs of oil prices.

No more subsidies

At a different level, the Prince wants to cut back the vast web of subsidies provided by the Royal Family to almost every Saudi citizens. But this may be a bit tricky. It is an open secret that direct or indirect payments to millions of people are the means through which the Saudi government keeps a lid on Saudi society. In a region marred by unrest and civil wars, not much anti-government unrest in Saudi Arabia, since almost every citizen gets a regular check from the government.

Problem: no real middle class

Well, so far so good. Except for one thing. Even assuming that all these reforms will work, at best Saudi Arabia can become more efficient. But it simply cannot become a modern society the way we understand it. For the very simply reason that Saudi Arabia does not have basic political freedoms and a modern middle class that can act as the engine of self-sustaining growth.

Here is the simple truth. Except for vast amounts of easy to extract and therefore highly profitable oil, Saudi Arabia does not have a real economy. Saudi Arabia does not have a sizable

educated middle class with a fair number of entrepreneurs engaged in profitable, innovative businesses.

Monarchy controls oil

Saudi Arabia is an oil Kingdom (second largest crude reserves in the world) essentially "owned" by a mostly parasitical elite. This elite, (the extended Royal Family), controls all the oil wealth. The same leadership distributes some of the oil revenue proceeds to the rest of the country, in many cases via bogus government jobs that produce no value. It is fair to say that most Saudis do not do any real work. In the Kingdom real labor is provided by foreign workers.

No modern middle class

Now, given this picture, I submit that unless these fundamentals are drastically transformed it is essentially impossible to re-engineer the Saudi society. Capitalistic economies succeed mostly because of the existence of basic political freedoms and because of a solid, entrepreneurial middle class. By that I mean large numbers of reasonably well-educated, driven individuals who engage in money-making enterprises. Their activities are supported by bankers, lawyers, accountants, marketers, public relations professionals and what not.

In other words, modern competitive economies do not exist without a vibrant middle class that can produce at least some capable entrepreneurs. These entrepreneurs understand the value of innovation. They understand competition within a rules based system fairly managed by an independent judiciary that can act as a reliable referee in case of disputes.

Oil is the only productive sector

Well, guess what, none of this exists in Saudi Arabia. And I sincerely doubt that any of this can be created –essentially out of nothing– by an energetic Crown Prince eager to

modernize a rent based economy in which, with the exceptions of the few skilled people who are in charge of the highly profitable energy sector, nobody has done anything even remotely approaching real, productive work for decades.

Rules based democracy

You want modernity? Well, then you need a rules based democracy in which people really understand and agree upon the proper balance between private and public, in which all players agree that the private sector is the driver of economic growth, while all economic actors appreciate the need to have and follow clear rules. You also need a government that is efficient, open, transparent, and fully accountable. Finally, you need basic freedoms, including laws that guarantee freedom of expression, and therefore truly free media.

Tinkering is possible; but no transformation

I see none of this in Saudi Arabia. Despite formidable constraints, I can see that some tinkering is definitely possible within the existing environment. If his reforms work, Prince Mohammed may be able to make the existing system less wasteful, less corrupt, and less dependent on the price of oil. And this is a good thing.

But he cannot create a brand new country and a new Saudi society. And without these two prerequisites in place, there will be no modern country.

Oil Prices Will Stay Low

WASHINGTON – I am not at all surprised to see that the Doha oil talks aimed at finding an agreement about stabilizing output among major producers failed. Saudi Arabia would have liked to freeze production at current levels, which means at the Kingdom's highest level in modern times, (more than 10 million barrels a day).

No deal with Iran

However, it was obvious that Iran could not possibly have agreed to freeze its own production at current levels. Tehran wants to ramp production up to its pre-sanctions peak. And how could anybody have assumed anything else? Of course the Iranians want to increase their oil production and regain lost market share.

Therefore, no deal. As a consequence, oil prices are once again headed lower. There was a time in which low prices were really good news in the West. But now it is a mixed bag, especially in the U.S.A.

Oil was good news in America

And how so? Well, because "unconventional oil" exploration and recovery –we are talking about shale oil– has been one of the brightest spots in the otherwise timid U.S. post 2008 economic recovery. Tens of thousands of new, high paying jobs made things better in many oil-producing states, from North Dakota to Texas.

U.S. oil in recession

But now, lower prices are bad news for a sector composed primarily of small to medium-sized companies, many of them under capitalized and highly indebted.

For small U.S. energy companies it was easy to get bank loans

when oil was at $ 100 a barrel, and therefore future profitability was not in question. But now it is at $ 40, possibly headed even lower. And therefore the U.S. oil patch is in a recession. Moody's just downgraded many U.S. energy companies. Tens of thousands of good jobs have already been lost, with more losses to come. This will have a nasty effect in the affected regions, and some negative impact on the overall American economy.

Resilience

Things are not awful across the board. In fact, the shale oil sector has proven to be much more resilient than most analysts had predicted. A combination of aggressive cost cutting and vastly improved production technologies allows at least some shale oil companies to stay profitable even with oil at $ 40. But this is only about some companies.

The other good news is that shale oil production is relatively flexible. It is not too complicated to shut down wells and then start production again in better times, when prices have recovered. Still, idled wells do not generate any income. Weak producers close down, or go bankrupt. Some may be bought by bigger competitors with deeper pockets.

Sure, at some point this cycle will end. Saudi Arabia cannot afford huge budget deficits for ever. Its bizarre policy of keeping production at these levels, (this way depressing prices), while the Kingdom needs to get into debt in order to fund current government operations (and that includes almost the entire country getting some money from the Royal Family) will end. But it will take a while. In the meantime, hard for U.S. oil workers to find other jobs that will pay so well.

Good news for consumers

That said, depressed oil prices, while they hurt an important sector of the U.S. economy, on balance are positive. America is still a major net oil importer. Lower prices translate into

a smaller balance of trade deficit. And for the average consumer cheap oil must be good news. Who can complain when finding lower prices at the pump? For tens of millions of American drivers low gasoline prices are equivalent to a tax cut. More money in their pockets.

The future of oil

That said, going forward, the real challenge for the U.S. oil sector is not Saudi Arabia flooding the global market. The real challenge will be new, non oil-based technologies.

Despite its uncertain beginnings, the electric car sooner or later will become economically viable. Elon Musk of Tesla has bet everything on making affordable, mid-sized electric vehicles, EVs. We are not there yet. Money losing Tesla may be will fail. But even if it does, others will follow. And when someone will hit the sweet spot with easy to recharge, attractive EVs with a good range that the average consumer can afford, it is good-bye to oil.

Saying good-bye

And that will be a real good-bye. It will not be about temporary sector recessions, or fluctuating prices due to Saudi shenanigans. It will be the end of the oil era.

Here in the U.S. at least someone will be prepared for this gigantic transformation. But economies such as Russia, Venezuela and Saudi Arabia which depend entirely on oil revenues to fund *"everything"* will be in deep, deep trouble.

All told, better to be in America. This society, with all its problems, is still capable of promoting change while embracing it when it comes.