Ahead of the Herd Newsletter - 2018 Issue Seven
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How global growth and infrastructure are driving commodities

As a general rule, the most successful man in life is the man who has the best information

The global economy is booming again after years in the doldrums, commodities are back in a big way, and metals prices are for the most part, way up.

In our last article showing how commodities are the place to be in 2018, we looked at five drivers: inflation, the low dollar, economic growth, the relative undervalue of commodities versus other sectors, and tightness of supply. This article expands on the economic growth argument, and explains how commodity prices are being moved by a bevy of infrastructure projects around the world – all demanding "yuge", as Donald Trump would say, amounts of metals.

But we'll also talk about how insecurity of supply has created a climate of uncertainty around commodities, fuelled by increasing trade tensions that could lead to tariffs and quotas, driving up the prices of some imported metals – further exacerbating supply-demand imbalances. The US is finally starting to get that it must reduce its reliance on foreign metal suppliers, which is great for domestic exploration and mining. But first, let's talk about global growth and what it means for commodities.

Three quarters of the world is growing

A year ago the global economy was stagnant following the recession of 2007-09, an overhang from the debt crisis in Europe, and slowing Chinese growth which had seen double-digit GDP numbers throughout the 2000s. According to the International Monetary Fund, 75% of the world is now enjoying a full recovery. The IMF predicts global growth to hit 3.7% this year, the fastest rate since 2010.

The World Bank says it's the first year since the financial crisis that the

global economy will operate at or near capacity. Emerging markets will see the lion's share of growth, 4.5%, while advanced economies including the US, Japan and the EU will grow at 2.2%. China is expected to grow between 6 and 7%. India, Ghana, Ethiopia and the Philippines will grow more than China, and eight of the 10 fastest-growing countries this year are likely to be in Africa, according to consulting firm PwC.

Goldman Sachs was quoted saying that "rising commodity prices will create a virtuous circle, improving the balance sheets of producers and lenders, and expanding credit in emerging markets that will, in turn, reinforce global economic growth."

At the end of 2017 the Bloomberg Commodity Index, which measures returns on 22 raw materials, had the longest rally on record dating back 27 years to 1991.

The index was propelled by major yearly gains in copper, which had its best month in 30 years in December, oil, which moved above $60 a barrel for the first time in over two years, and gold, up for the second year in a row, by 12.5% in 2017. The roll continued into the New Year, with the index hitting a three-year high on Jan. 5 due to what the Financial Times described as the global economy's best period of growth (measured in manufacturing activity) since the 2008 financial crisis.

At this year's World Economic Forum in Davos, Switzerland, the tone was vastly different from the past two years when everyone was talking about the bear market for commodities and the oil price crash.

"In panel discussions, interviews, and conversations on the evening cocktail circuit at the Steigenberger Grandhotel Belvedere, it was hard to find a bearish voice," Bloomberg reported.

Key infrastructure metals all rising

Building large, capital-intensive public and private infrastructure projects all requires mined metals, in particular steel for bridges and buildings, aluminum, copper for wiring, and inputs used for making steel: coking coal, iron ore, manganese and vanadium. Nickel is also used in large quantities for stainless steel.

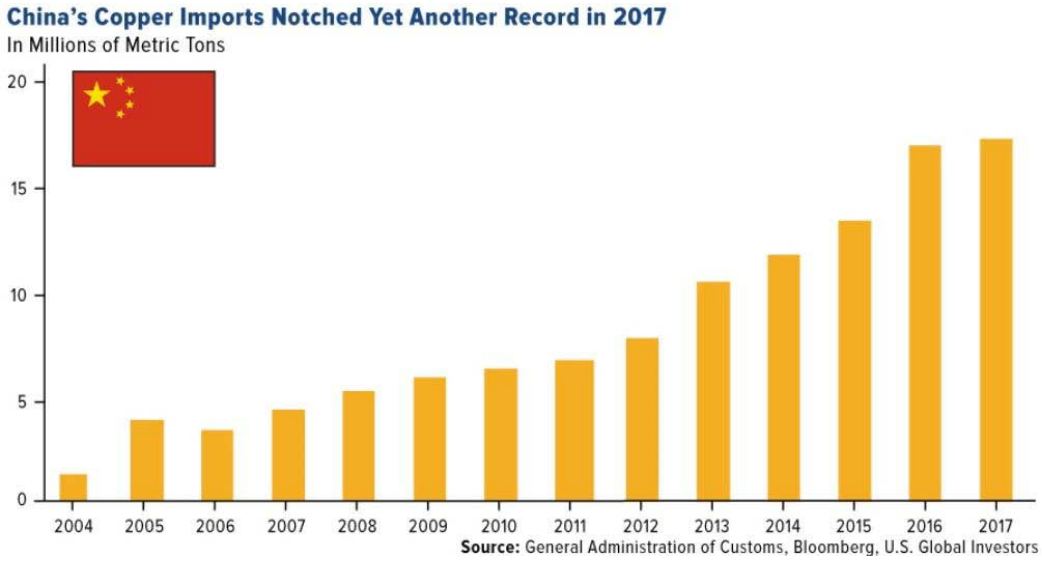
The outlook in 2018 for these commodities is for the most part bullish. A report from the World Bank states that a correction in iron ore prices – due primarily to a supply glut – will be offset by jumps in other base metals including lead, nickel and zinc.

A week ago mining stocks outperformed overall gains in US stock markets following the Feb. 5 correction, with investors piling into mining heavyweights like BHP, Vale, and Anglo American. The optimism was spurred by global demand for raw materials ahead of the annual Chinese New Year holiday. Copper rose above $3.24 a pound, nickel was at 14,100 a tonne, the highest since May 2015, and zinc hit a near-decade high of $3,567 a tonne. Even the iron ore price which many expect to pull back, rose to a five-week best of $78.25 a tonne.

Speaking recently with Robert Friedland of Ivanhoe Mines, US Global Investors CEO Frank Holmes laid out the bullish case for copper, noting the ever-increasing demand for the red metal not only in industry, but electrical vehicles which consume three to four times as much copper as gas-powered cars and trucks.

Friedland pointed to aluminum, cobalt, nickel, platinum and scandium as among the biggest beneficiaries in the shift to EVs and clean energy. Holmes mentioned a few other key trends that are driving commodities higher, including the global purchasing managers index (PMI) being near a seven-year high, construction confidence in the Euro Zone, and construction spending in the US which hit a record $1.257 trillion in November.

As usual a crucial factor is China, the world's largest consumer and producer of metals. On Feb. 8 China's copper concentrate imports increased 25% from the same period last year, continuing the trend from 2017 when copper imports hit a new high due partly due to Beijing banning of scrap metal and other recyclables.



The Chinese have also been importing record amounts of iron ore – 102.8 million tonnes in September 2017. China wants higher-grade ore because it boosts steel-making productivity and reduces emissions.

China's iron ore imports rose in January even as steel mills are idled as part of a government drive against pollution and stockpiles at ports reached new peaks above 150 million tonnes. The country consumes two thirds of the world's iron ore shipments and produces as much steel as the rest of the world combined.

And for all the talk of the coal industry being on its knees, prices of the fossil fuel are up and so are US coal exports. Platts reported that in 2017, US coal exports rose by 60% between 2016 and 2017, to 88 million tonnes. Thermal coal prices in 2017 were the highest in Northern Europe since 2012 - $84.77 a tonnes, while met-coal prices used in steelmaking averaged $173.95/tonne, up 39% from 2016.

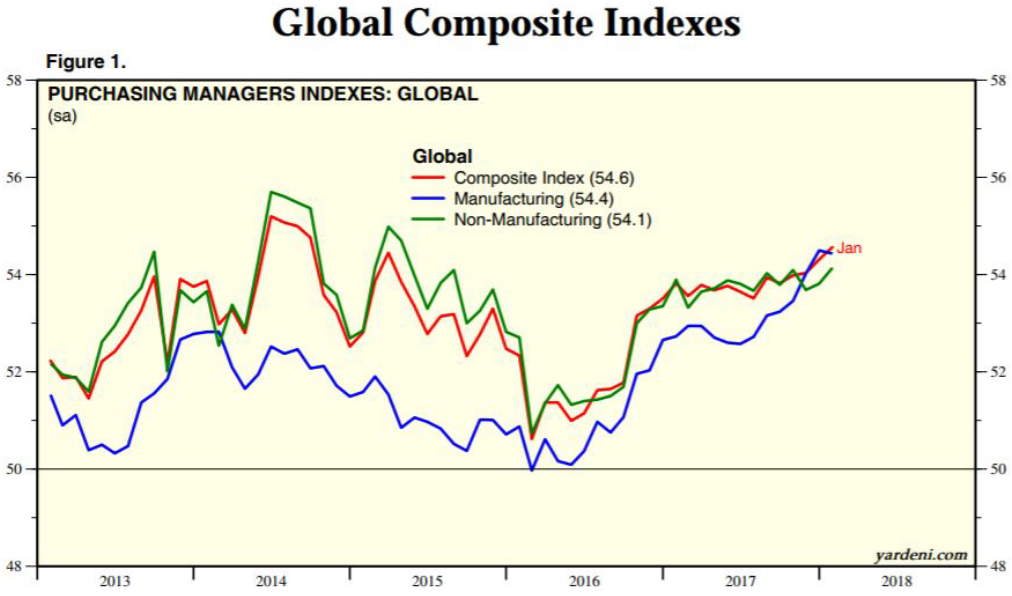
New commodities super cycle?

Many investors are wondering whether we've begun a new commodities super cycle.

"Purchasing Managers' Index™ (PMI™) surveys have been developed in many countries to provide purchasing professionals, business decision-makers and economic analysts with an accurate and timely set of data to help better understand industry conditions.

PMI data are based on monthly surveys of carefully selected companies. These provide an advance indication of what is really happening in the private sector economy by tracking variables such as output, new orders, stock levels, employment and prices across the manufacturing, construction, retail and service sectors.

The PMI surveys are based on fact (latest PMI's from Markit Economics), not opinion, and are among the first indicators of economic conditions published each month. The data are collected using identical methods in all countries so that international comparisons may be made." Markit Economics



Here is a link to more global PMI charts from Yardini Research.

"Super cycles are extended periods of historically high global growth, lasting a generation or more, driven by increasing trade, high rates of investment, urbanisation and technological innovation, characterised by the emergence

of large, new economies, first seen in high catch-up growth rates across the emerging world"~ *Helmut Reisen shiftingwealthblogspot.com*

As mentioned, Goldman Sachs, the influential investment bank, thinks that rising commodities prices will expand credit in emerging markets, thus creating more economic growth. Back in 2011 I wrote about how developing economies will boost the commodities supercycle, with the drivers in these countries being population growth, urbanization and the growth of the middle class, all of which spur consumption – of cars, fridges, smart phones, etc. These minerals have to come from somewhere.

In Daily Reckoning Australia, Callum Newman observes that there is some serious money right now sloshing around waiting to find a home. Examples include Saudi Arabia's Crown Prince wanting to spend US$500 billion to build a new city, and Australia's $130 billion Future Fund. Callum presages a new mining boom in Australia by pointing out that between 2010 and 2025 infrastructure spending in Asia will hit US$5.3 trillion, with China's total spend increasing 250% and for the Philippines, 300%. All of this bodes well for Australia, a major exporter of iron ore and coal, used to make steel needed for bridges, roads and airports, plus gold and other minerals.

Maxwell Gold, director of investment strategy and research at ETF Securities, agrees that we are on the cusp of a new commodities super cycle, which he points out usually last 10 to 15 years.

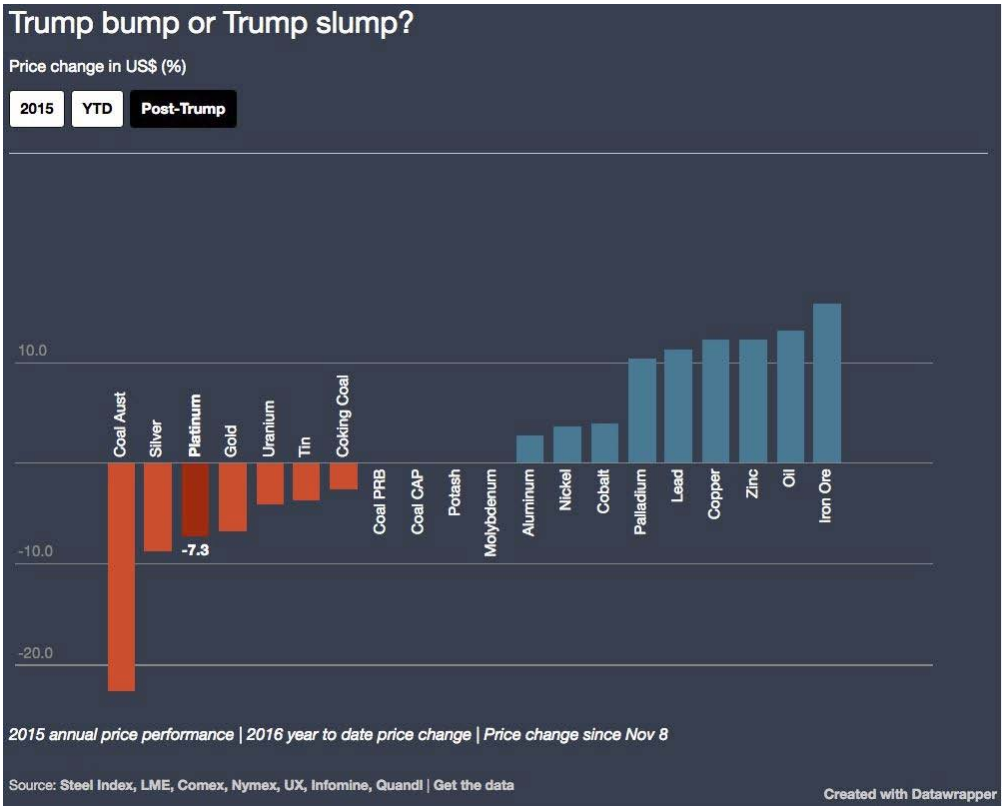
Gold says we are currently at the last phase of the current business cycle (lasting 5 to 7 years) where commodities tend to outperform stocks.

"The Fed and other central banks want to increase interest rates to slow down and control economic growth to prevent the economy from overheating too much. That typically goes hand in hand with a period where there's increased demand for inputs, raw materials and resources — primarily commodities. It's very typical to see commodity prices increase when we're in a rate-hiking cycle and interest rates are rising."

Infrastructure engine revving up

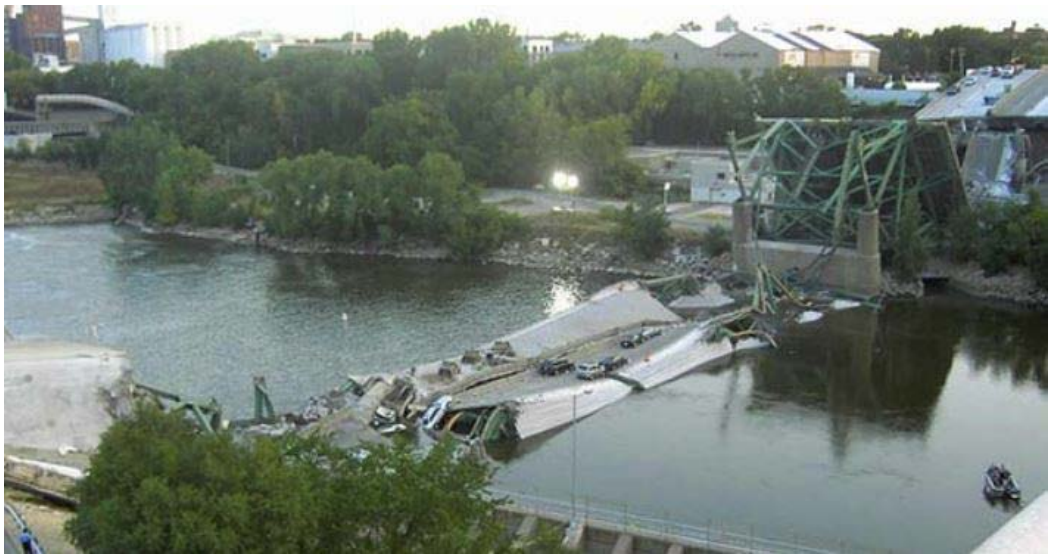
Most of us have heard of Donald Trump's $1-trillion infrastructure plan to fix American's crumbling cities, touted during his 2016 election campaign. A year into his mandate, that spending has been elevated to $1.7 trillion over the next decade. When or whether it comes to fruition is still fuzzy – the plan being presented to Congress involves $200 billion in federal funds, an amount being disputed by Democrats, and could involve a gas tax to pay for it – what is interesting is what happened to commodities after Trump was

elected. A month after the election was decided on November 8, 2016, oil and most base metals received a [“Trump bump”](), as shown in the graph below by MINING.com – proving that the promise of infrastructure spending has a direct impact on commodity prices – albeit in the short-term.



The effect of the US infrastructure plan on metals prices in 2018 is difficult to say, but one thing is for sure: the need is desperate. A 2017 [report from the American Society of Civil Engineers]() gave America's infrastructure a D+ and found that the US is facing $4.6 trillion in infrastructure investment needs over the next 10 years. The report looked at 16 categories including bridges, schools, railways and ports.

“Deteriorating infrastructure is impeding our ability to compete in the thriving global economy, and improvements are necessary to ensure our country is built for the future,” according to the ASCE. Consulting firm PwC estimated in a comprehensive infrastructure report that the US is looking at a total funding gap between 2016 and 2025 of $1.4 trillion, with the vast majority of funds needed for surface transportation ($1.1 trillion funding gap).



North of the 49th, Canada also plans to roll out a major infrastructure spend, though far less ambitious than the one planned in the US. The federal government's $5.4 billion infrastructure package in transit and water systems for provinces and cities was recently extended from two to five years. Ottawa and the Yukon Territory are partners in a promise to spend $360 million for road access to mineralized areas in the Yukon, including 650 kilometers of new roads and road upgrades.

The Quebec government has called for the province to invest about $1.3

billion in infrastructure over the next five years to attract $22 billion in private sector investment. The scaled-down “Plan Nord” aims to access untapped deposits of iron ore, copper, nickel, zinc and other minerals in Quebec's far north. Next door in Ontario, the provincial government is moving forward on an all-season road to the Ring of Fire, allowing roads in to a wealth of minerals in the remote region including chromite, nickel, copper, vanadium, zinc, platinum and gold.

Looking globally, Futurism put together a graphic of the world's largest megaprojects currently under construction. They are:

- the International Space Station: $150 billion
- Al Maktoum International Airport, Dubai: $82 billion
- South to North Water Transfer Project, China: $78 billion
- California High-Speed Rail: $70 billion
- Dubailand: $64 billion
- London Crossrail Project: $23 billion
- Beijing Daxing International Airport: $13 billion
- Jubail II, Saudi Arabia: $11 billion
- Hong Kong-Zhuhai-Macao Bridge: $10.6 billion

In terms of commodities demand, though, the most impactful country is, without a doubt, China.

“More than 2,000 years ago, China’s imperial envoy Zhang Qian helped to establish the Silk Road, a network of trade routes that linked China to Central Asia and the Arab world. The name came from one of China’s most important exports - silk. And the road itself influenced the development of the entire region for hundreds of years.

In 2013, China’s president, Xi Jinping, proposed establishing a modern equivalent, creating a network of railways, roads, pipelines, and utility grids that would link China and Central Asia, West Asia, and parts of South Asia.” McKinsey & Company

China’s One Belt, One Road is a $900 billion initiative meant to open channels between China and its neighbors, mostly through infrastructure investments. China long ago put a lock on much of Africa’s vast resources. The rationale is to increase trade in order to bolster poorer countries to China's south, and foster new markets that will keep China's economy going strong. According to the World Economic Forum, "Beijing says it will ultimately lend as much as $8 trillion for infrastructure in 68 countries," which represents a third of global GDP.

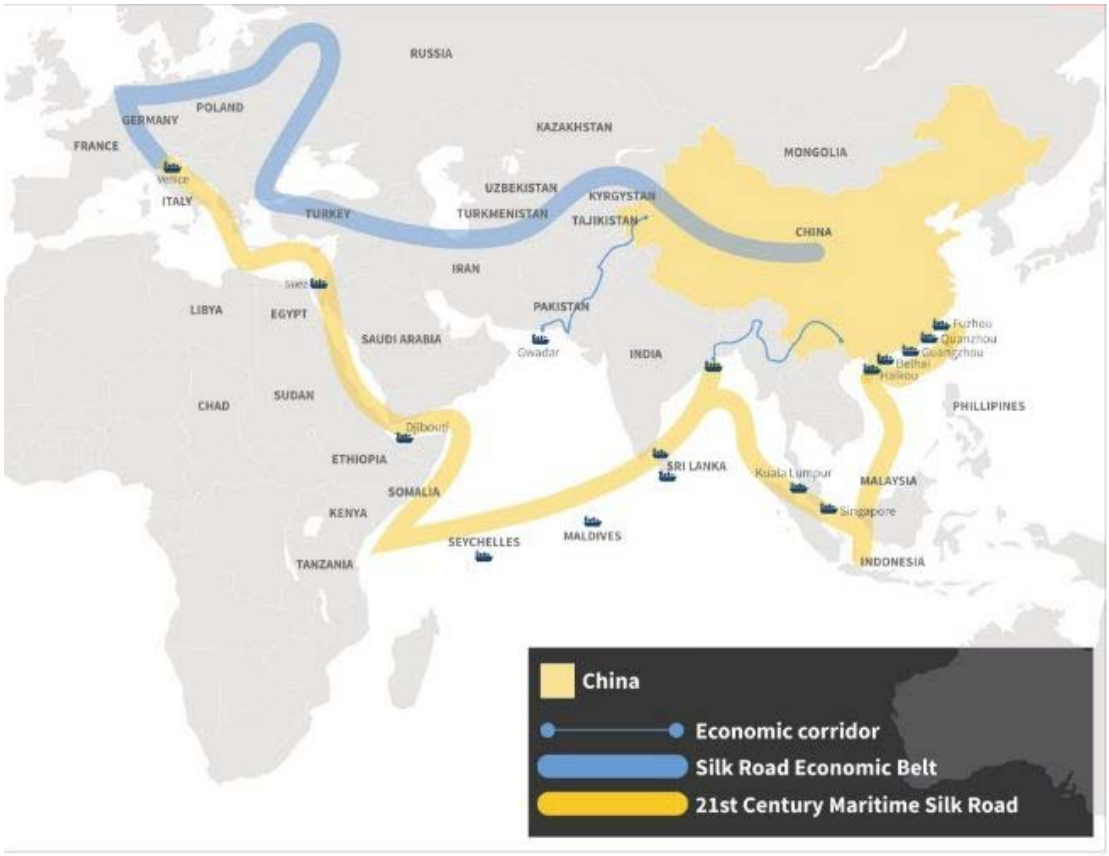


Image: Lowy Institute

And there's more. Last April President Xi Jinping announced a grand scheme to transform a backwater called Xiongan, south of Beijing, into a city triple the size of New York. Consulting firm Wood Mackenzie estimates that building the city will use 20 million tonnes of steel, 400,000 tonnes of aluminum, and 250,000 tonnes of copper during the first 10 years of construction.

Are two Belt and Roads better than one? Australia, the US, India and Japan are planning a joint regional infrastructure scheme as an alternative to China's multibillion-dollar Belt and Road Initiative.

Supply insecurity

Completing all of these infrastructure projects will require millions, maybe billions of tonnes of iron ore, coal, steel, copper, vanadium, cement and asphalt. But what is often lost in the discussion about commodities is where these materials will come from and whether the countries requiring them will be able to get their hands on the metals in time and in the quantities needed. I've written before on the metallurgical Achilles heel of the United States, which has allowed the depletion of four critical metals: chromium,

cobalt, manganese and platinum. Added to this list should be vanadium, which is becoming increasingly important as an ingredient (vanadium pentoxide) in vanadium flow batteries used in renewable energy storage.

The U.S. is dependent on South Africa, the politically unstable Democratic Republic of Congo (DRC) and an increasingly unreliable and aggressive China for over half of its supply of what it considers strategic or critical minerals.

“As resource constraints tighten globally, countries that depend heavily on ecological services from other nations may find that their resource supply becomes insecure and unreliable. This has economic implications – in particular for countries that depend upon large amounts of ecological assets to power their key industries or to support their consumption patterns and lifestyles.” Dr. Mathis Wackernagel, President of the Global Footprint Network

The United States has no producing manganese or vanadium mines. Stillwater Mining is the only American miner of platinum group metals, and there is just one company in Michigan that produced cobalt in 2017 as a by-product of nickel and copper.

Cobalt is an interesting metal to look at because it demonstrates the stark and growing disparity between supply and demand, reflected in a massive recent price spike. Over the past year cobalt prices have nearly doubled from US$47,500 a tonne to $80,000/tonne.

As a key ingredient in lithium-ion batteries that power electric vehicles (cobalt is used in both nickel-cobalt aluminum (NCA)-based battery cells used by Tesla and nickel-manganese cobalt (NMC) batteries employed by other EV manufacturers), cobalt is in high demand by battery makers.

Tesla says it wants to make half a million EVs a year, and has repeatedly stated that it plans to source the cobalt for its Gigafactory exclusively from North America. But the numbers don't add up. According to the US Geological Survey Canada and the US together produce only 4% of the world's cobalt supply – around the amount Tesla would need for just one of its models. In 2017 the US and Canada produced 4,950 tonnes of cobalt against the world total of 110,000 tonnes. How about metal in the ground? North American reserves stand at 273,000 tonnes versus 3.5Mt in the Congo and 1.2Mt in Australia.

But there's another problem with cobalt supply. Around 97% of it is mined as a by-product of copper and nickel, so in order for cobalt mining to be economic, the prices of nickel and copper need to be high enough to make mining the deposits economic. 60% of the world's cobalt reserves and

resources are in the DRC, which uses child labour and is highly unstable. One of the largest African copper-cobalt mines is Tenke Fungurume, in the DRC. US copper miner Freeport MacMoran used to hold 56% of the mine, with Lundin Mining and Congolese state-owner miner Gecamines owning the rest, but in 2016 China Molybdenum acquired Freeport's portion for $2.65 billion – the largest ever investment in the country.

So, we now have the largest cobalt mine in the DRC majority-owned by China, in a country that controls 60% of cobalt supply, and we have virtually no domestic supply, with demand and prices for a scarce commodity exploding.

Let's take manganese as another example. While 10 to 20 pounds of manganese per ton of iron is needed to make steel, an equally important application is electrolytic manganese metal. EMM was historically used in the alloying of steel, stainless steel and aluminum but a more recent application of electrolytic manganese dioxide (EMD) – a refined form of manganese- - is for the anodes of lithium-ion batteries used in EVs. This technology is already used in GM's Volt and the Nissan Leaf. The United States is the largest consumer of EMM but guess who produces 97% of the world's EMM? China.

The good news is that the United States has finally woken up to the fact that it needs to secure some of these strategic minerals. As part of the Trump Administration's plan to stoke the domestic economy, the Interior Department last Friday announced it wants to boost domestic production of 35 critical minerals including uranium, cobalt and lithium, to reduce its reliance on foreign suppliers.

"Any shortage of these resources constitutes a strategic vulnerability for the security and prosperity of the United States," said an Interior Department spokesman.

But some companies and countries aren't waiting. Tesla and Volkswagen AG are already hunting for long-term supplies of battery metals, while on Wednesday, Apple said it is considering going directly to miners to source cobalt – a key ingredient in mobile phones as well as EVs. As we have just shown, that means talking to the Chinese and the Congolese.

A week ago Sweden joined the race for cobalt and lithium, saying it will invest 10 million kronor (1.26 million) over the next two years to find battery metals. Sweden's Volvo plans to make all of its new car models electric from 2019.

Metal wars

It doesn't take much of a leap of logic to see that competition for critical metals and those essential for building infrastructure and society as a whole – like steel and aluminum – is heating up. Of the 35 metals the US has identified as strategic, many are produced by countries the US and Canada would not consider to be friendly. Take China and Russia as the two most obvious examples.

Last week the US Commerce Department recommended imposing tariffs or quotas on foreign producers of steel and aluminum. This was the result of an investigation into whether the imports posed a threat to national security. They do.

"The Secretary of Commerce concludes that the present quantities and circumstance of steel imports are 'weakening our internal economy' and threaten to impair the national security as defined in Section 232," the department said. It recommends a 24% tariff on all steel imports, and 7.7% on aluminum. Or, the US could target 12 countries including China and Brazil which export the most cheap steel to the States. If that were to happen, those countries could face 53% tariffs or higher.

China responded immediately to the Commerce Department threat, suggesting that US exports of sorghum and soybeans could face trade retaliatory trade restrictions. The Trump Administration has already imposed new tariffs on made-in-China solar panels and washing machines. South Korea, a major steel producer and one of the 12, said Tuesday it will consider filing a complaint with the World Trade Organization if the US follows through on steel tariffs.

Tariffs or import quotas are generally imposed to protect domestic industries, by increasing the prices of the higher-taxed goods, making American-made goods more competitive. The higher costs of imported goods however may be passed on to consumers, who would pay more for goods made from imported steel, for example.

Russia is another tempest that the United States seems to be constantly battling. First it was sanctions imposed on Russia for the annexation of Ukraine and the still-mysterious shooting down of a Malaysian airliner. Now it's suspected Russian interference in the US election.

The recent indictment of 13 Russians for intervening in the 2016 presidential election has only made matters worse. Could the tensions spill out into a trade war? It hasn't happened yet – President Trump has a lot of business

ties to Russia as demonstrated by the infamous meeting at Trump Tower organized by Donald Trump Jr. with Russians who had links with the Kremlin – but according to Aljazeera, "Tensions between Russia and the US.... were on full display during the second day of a high-profile security conference in Germany featuring world leaders and top diplomats." A hint that a trade fight may be coming though was seen on Tuesday, when Russia joined South Korea in saying it will lodge a complaint to the WTO if the US acts on its threat to impose stiff sanctions on Russian steel and aluminum.

Conclusion

For the first time in a decade we are looking at across the board global growth in both developed and developing economies, setting up tremendous demand for commodities – both mined and grown – due to the effects of urbanization, growing middles classes and population growth. Add to this the ambitious plans for infrastructure spending in the US, Canada, China and elsewhere, and the bullish case for mined metals becomes even stronger.

But even as demand for metals, particularly battery metals used in the new electrified economy, continues to skyrocket as witnessed by the shocking increases in the one-year prices of lithium and cobalt, competition is becoming intense. Countries and companies are starting to realize that without a domestic supply, they are wholly dependent on foreign suppliers who set the prices and could easily hold these metals for ransom to extract political or economic capital from the buyers. For example, if Gabon, from which the US imports three-quarters of its manganese, suddenly decided to ban Mn exports, the effect on the US steel industry would be crippling.

All of this points to the need to develop local, North American producers of strategic metals that can act as a counter-point to the trade disadvantage the US and Canada currently find themselves in. The Trump Administration's plan to increase domestic production is laudable and a long time coming. Let's see whether the talk turns into action. I've got commodities and infrastructure spending on my radar screen, and I am on the hunt for investment opportunities that can make North America less dependent on foreign sources of strategic metals.

Are the future suppliers - our junior resource companies whose place in the resource food chain is to explore for, find, and develop to a certain point the world's future mines – of metals and minerals that enable your modern lifestyle on your radar screen? I can guarantee they are on mine.

If they are not on yours, maybe they should be?

Richard (Rick) Mills

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Red Queen versus Bread And Butter

As a general rule, the most successful man in life is the man who has the best information

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The technology that allowed for the extraction of "tight" oil and gas contained within layers of shale rock - fracking and horizontal directional drilling - has propelled the United States into being the third largest producer of oil and on the peak of overtaking number one and two – Saudi Arabia and Russia, maybe even sometime this year.

While the output numbers are impressive, they mask an under-reported, dark little secret about the "shale revolution": it's not sustainable. Productivity in the major shale plays like the Bakken, Eagle Ford and Permian Basin have plateaued, and the United States is gradually depleting its shale reservoirs. While the talk right now is of US energy independence, the United States still imports 8 million barrels of oil a day, mostly from Canada, where oil exploration has all but ground to a halt. The US will of

course continue to produce shale oil, but the profitability of the industry looks increasingly shaky. Given these realities, Ahead of the Herd investors should be looking less towards the shale producers to make gains (collectively they have lost money every year) and more to conventional, "bread and butter" oil and gas exploration.

US vs OPEC

The price of oil right now is dependent on how fast the global glut of oil that has kept prices low for around the past three years - only rebounding last fall - is depleted to a level where OPEC members believe it is profitable to turn the taps back on. Recall back in November the 14-member oil cartel and Russia reached a deal whereby they would extend earlier output cuts – about 1.8 million barrels per day - until the end of 2018.

But OPEC and Russia are keenly aware that the United States, not being part of the deal, is continuing to pump oil and export it at record numbers, increasing the revenues of US oil companies at the expense of their own.

Saudi Arabia and the rest of OPEC have seen this movie before. When the new wave of US shale oil supply that started in 2010 gushed to a peak in 2014, OPEC scrapped output limits, hoping that flooding the market with supply would restrain US shale production through lower prices. Instead, shale producers found cheaper ways to operate – like multi-pad operations, faster drilling, and more effective fracking – meaning that output continued to rise, and prices stagnated. OPEC then returned to its previous strategy of lowering output to let prices rise again, which is where we're at now.

There are signs that the cartel's target is close to being reached which could nullify the reason for capping output. According to the IEA, OECD inventories are now only 52 million barrels above the five-year average, compared to 264 million barrels a year ago.

"With the surplus having shrunk so dramatically, the success of the output agreement might be close to hand," the IEA wrote in its February Oil Market Report.

Bloomberg reported this week that no longer are full tankers floating around Iran and South Africa and that US stockpiles including the Strategic Petroleum Reserve (SPR) are at their lowest levels in three years.

US oil supplies shrinking

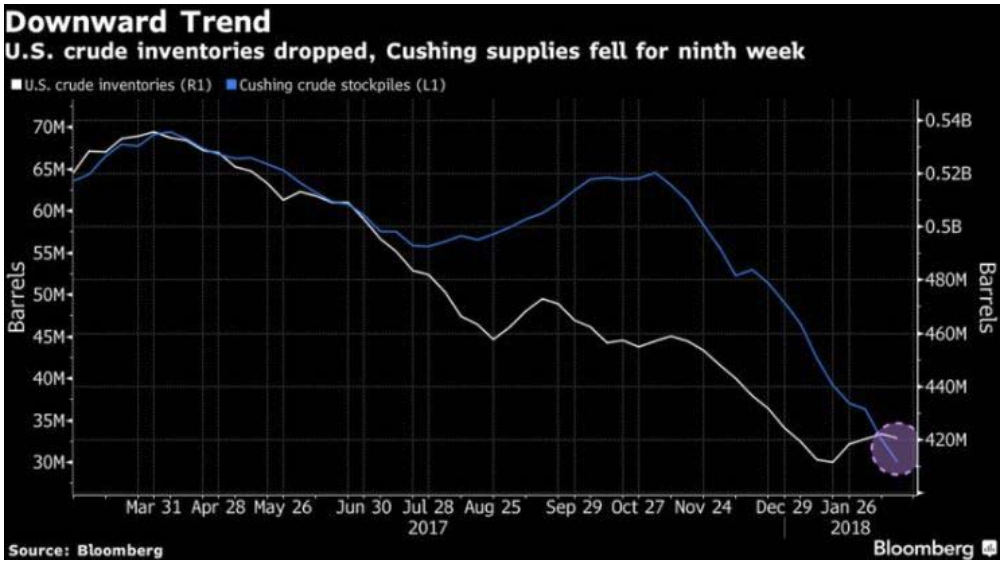
Last summer the SPR, set up in the aftermath of the 1973 oil embargo, slid

to a 12-year low because the US sold almost 17 billion barrels of crude from the oil stored in salt caverns in Louisiana and Texas to companies including PetroChina. Lawmakers feel that with the US awash in oil, there's no need to keep the reserves topped up.

And under a spending deal that recently passed both Houses of Congress, the US is about to sell half of the SPR to help pay its bills, which defies the reason for having the stockpile in the first place: for emergency supply disruptions like hurricanes. The deal would sell 100 million barrels, depleting the SPR by 45%.

The shrinking of American oil supplies is having a a direct effect on prices. On Wednesday oil moved to its highest in two weeks due to a government report showing that US crude stockpiles decreased by 1.62 million barrels – the largest drawdown in five weeks. The depletion was aided by crude moving from Oklahoma storage facilities to the Gulf Coast, where exports jumped 55% to 2 million bopd, the most since October according to Bloomberg.

As global oil stocks drain, OPEC wants to maintain the cuts in order to keep prices up and companies profitable. Saudi Arabia in particular is reportedly waiting for $70 oil so that its Saudi Aramco IPO can go ahead as planned. But OPEC has a problem.

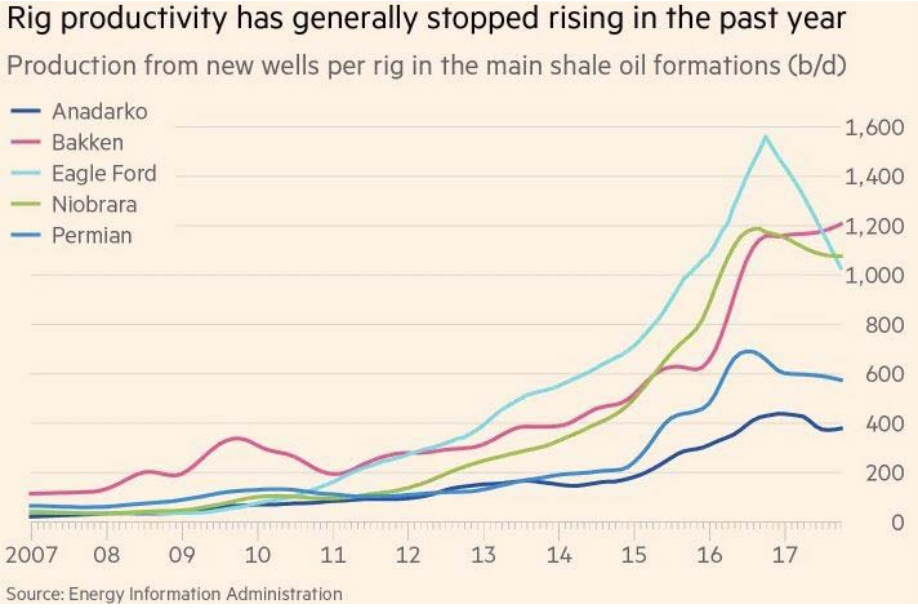


"The basic paradox confronting OPEC is that the more it succeeds in bolstering prices, the more it emboldens shale explorers and other competitors, Mike Wittner, head of oil market research at Société Générale SA in New York, told Bloomberg in November. "Increases in U.S. oil

production [in 2018] will be big enough to cancel much of the sacrifices made by OPEC and Russia, leaving the surplus more or less intact, forecasts from the International Energy Agency show. The recent rebound in prices could energize shale even further."

Peak shale?

Will it though? The evidence actually points to a levelling off of shale production, as productivity increases stop and wells are tapped out, or drilled and never completed. Reporters usually go by rig counts to indicate the strength of US output, but rig counts don't tell the full story. While rigs rose last week by seven to 798, marking the fourth-straight weekly rise, rig productivity gains have basically dried up. Productivity data from the EIA and charted by the Financial Times shows that while production in the main shale formations grew steadily from 2007, rising sharply in 2015 (the Eagle Ford peaked at nearly 1.6 million bopd) mid-2016, in the past year rates have declined.



Data from Baker Hughes showed that a year-long ramp-up by US shale operators hit a plateau last July, with some companies, like Pioneer Resources, lowering their targets. Shale growth estimates for 2018 vary wildly from between half a million barrels to 1.7 million a day.

The lower numbers have some predicting that US shale oil production could peak before 2025. This is because shale oil wells are gushers in their first year, then deplete rapidly. Last fall consultancy Wood Mackenzie modelled three scenarios for the growth of the Permian, the most productive US shale

play. It found that while barrel-per-day production could increase by 500,000 in a base case, with new technology, “downside risks related to tighter well spacing and well-on-well interference could bring peak Permian production forward by 4 years compared to the upside case — putting more than 1.5 million b/d of future production in question.” According to Wood Mackenzie, this means Permian production would peak in 2021 versus the more optimistic 2025.

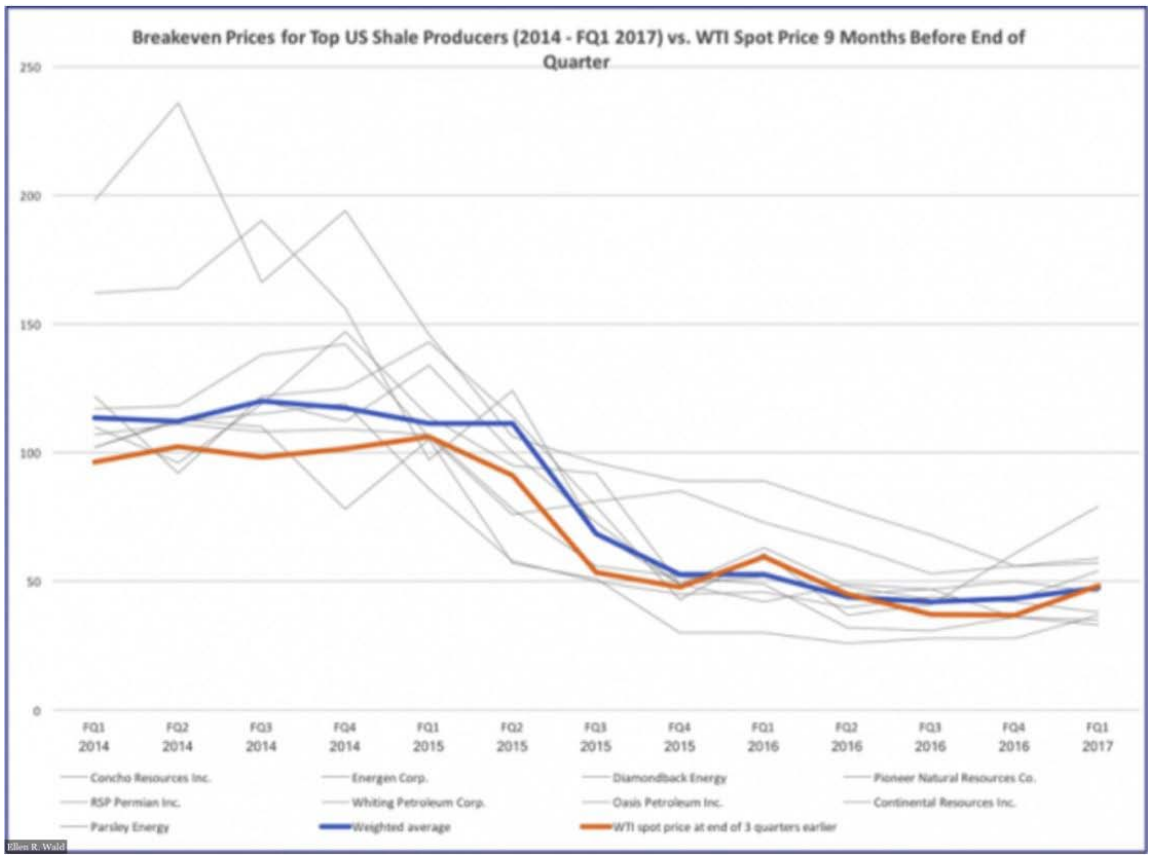
A report this month from from the Post Carbon Institute argues that the EIA's rosy forecast of strong US oil and gas growth for several decades – with shale oil not peaking until the 2040s – is simply wrong.

“Well productivity improvements have flat-lined or decreased in all but two counties, indicating available well locations are running out,” Oilprice.com quoted the Post Carbon Institute report. It also says the EIA has overestimated the Eagle Ford play area by 65%.

It's the old story with shale - what’s been termed the Red Queen Syndrome - where drillers have to drill more, faster and better just to keep up with wells that keep depleting. Shale wells typically bleed off 70 to 90% in their first three years, and drop by 20 to 40% a year without new drilling.

The walking dead

Shale companies are therefore money losers because they have to keep ploughing more money into production just to keep output flat. While the producers like to boast that productivity gains have increased output and cut costs, in fact the breakeven costs for shale producers have consistently been above the price of WTI, as the graph from Forbes below shows.



Note the blue line since 2014 (the weighted average) is mostly above the orange line (WTI) and producers were frequently above the blue line; in 2014, when the oil price tanked, most were way above that line. The story behind the graph produced by a Texas economist and oil industry consultant shows that shale costs have nothing to do with the current price of oil. "Because shale costs are not fixed or even stable, the industry will likely struggle to achieve consistent profit … Essentially, shale should struggle to achieve sustained profitability, no matter the price of oil."

The article points out that shale producers are heavily dependent on institutional investors and lenders, who demand growth and fail to reward cost-cutting. Shale producers must therefore spend and pump in order to keep their funders happy.

Peak Prosperity paints a picture of a heavily-indebted industry that has burned through cash every year since 2012, whether the oil price was $100 or $30 a barrel. The Economist agreed last summer that the biggest 60 firms used up $90 billion a quarter for the past five years – with total debt at over $200 billion.

"The bottom line is this: The US shale industry resembles a fraudulent Ponzi

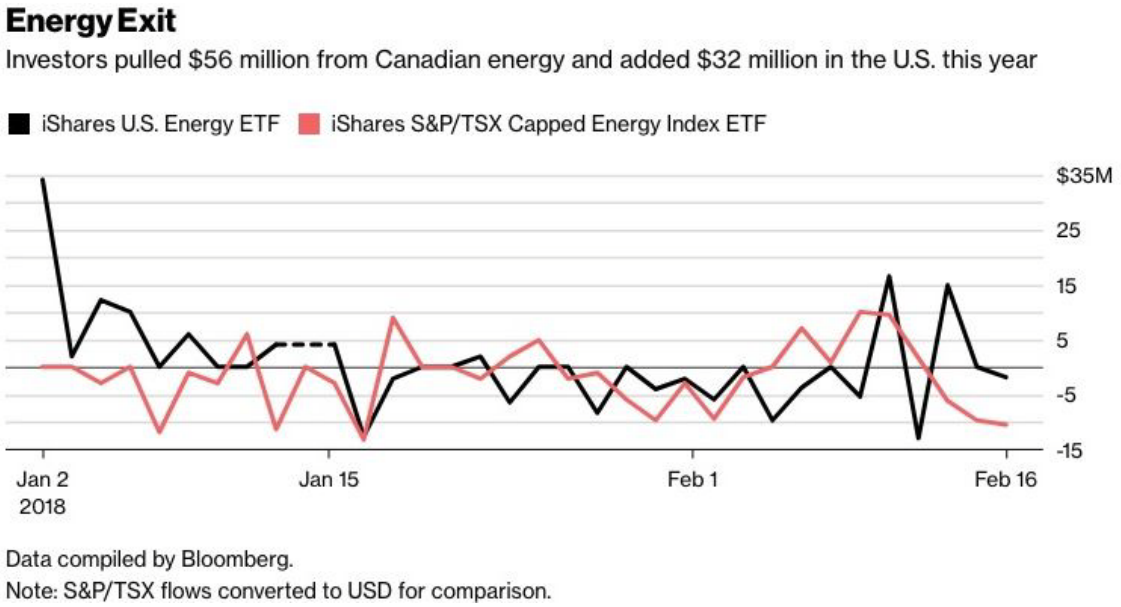
scheme much more so than it does any kind of miracle." Peak Prosperity

Canadian drillers heading state-side

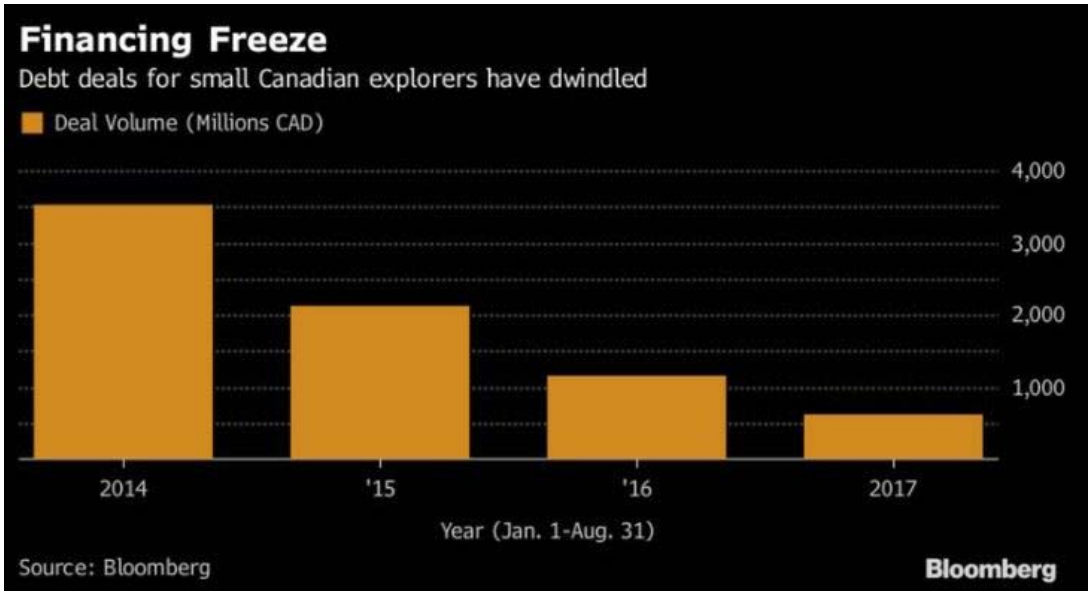
If the shale revolution is basically over, what about the opportunities for oil exploration in Canada, the number one oil exporter to the United States? While pipeline proponents like to think that Canadian oil exports to the US could dramatically increase, the reality is that we have seen a dramatic slowdown in the Canadian oil patch.

Getting Alberta oil to tidewater is always seen as the holy grail for Canadian producers because then they can export it and receive Brent crude prices, which are always higher than Western Canadian Select – a heavy crude blend derived from the oilsands. Leaving aside pipeline politics, the problem is that until more pipelines are built, Alberta oil remains landlocked and must receive the WCS price which is currently trading US$20.50 (Cdn$25.90) below WTI, as of Tuesday.

More than the price differential though, which has been a problem for years, is that investment is fleeing Canadian oil. A graph published on Wednesday shows investors ripped $56 million out of Canadian energy stocks and dumped $32 million into US energy stocks this year. The reason? Too many taxes, and too much regulation up north.



It's even worse for Canadian drillers, who have been starved of capital by the big banks which usually finance junior explorers. Retail investors have also fled the Canadian oil patch in search of better returns.



“The dearth of fresh capital has trimmed the ranks of junior explorers dramatically, bringing the search for oil and gas in Canada nearly to a standstill. Their extinction could have far-reaching effects, making it harder for the industry to ramp up production when prices rebound by depriving large producers of the buyout targets they typically rely on to replenish reserves,” Bloomberg reported last fall.

Share offerings under $100 million for the first eight months of 2017 were down 39% compared to the same period in 2016. A report from the Fraser Institute ranked Alberta 33rd on a list of destinations for oil and gas investment, with most on the survey saying taxes are too high. Global News reported the Canadian Association of Oilwell Drilling Contractors forecast 6,138 wells to be drilled in its 2018, just 107 more than 2017. The CAODC shows drill rig utilization at a dismal 43% in the first quarter of this year, falling to 18% in Q2, then rising to 32% in Q3 and 37% in Q4.

Some drillers are so fed up, they're moving state-side. A growing number of Canadian drill rigs are being trucked across the border to take advantage of a better climate for oil and gas exploration. The rigs will likely be crewed by American workers. “We’ve raised taxes, we’re increasing costs because of labor laws that are changing, we aren’t building pipelines and we can’t get federal or provincial governments to do anything to help us,” one drilling services company CEO told Global at the end of January.

Advantagewon

It was partly the frosty investment climate of his home Canada that had

Advantagewon Oil Corp (CSE:AOC) CEO Charles Dove looking to Texas instead of Alberta or BC. He found that the comparatively friendly business environment, less regulations, and plentiful labor supply made Texas an excellent place to setup shop.

Their idea is to tap existing oil reservoirs that have been depleted or only partially developed. Advantagewon plans to use the cheapest method of enhanced oil recovery (EOR), water flooding, whereby water is pumped into the reservoir to raise the pressure, thus allowing oil to again be pumped. The technology has the potential to increase recoveries to as much as 75% of the oil in place. Wells in Texas can be drilled much cheaper than in Canada (under $75,000) and Advantagewon is being paid in WTI, not WCS, which trades at a $20 per barrel discount. Being a Canadian company, AOC has to pay its expenses in US dollars but earns revenue in USD (USD$1=CAD$0.79).

The company currently has 34 leases in Texas and is producing in roughly equal amounts from two areas: Saratoga and LaVernia. The more prospective leases are in the LaVernia area, where wells can be drilled for quite a bit less than Saratoga.

This week Advantagewon released news indicating that it has received the first three permits for its upcoming drill program. According to the company, site prep for the first three of six wells is underway, with the drill rig scheduled to arrive on Feb. 27 weather permitting.

Once the six wells are up and running, at each producing 15 bopd, Advantagewon will increase its production to 135 bopd, triple its current 45 bopd. The company breaks even at 60 bopd.

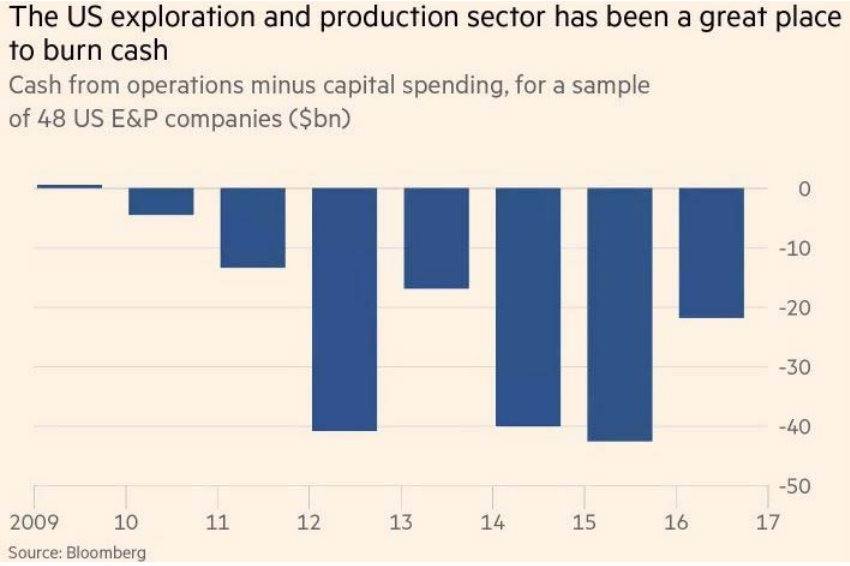
The business plan is ingeniously simple: find an existing pool, preferably in shallow, layered sands, and drill it – recovering as much oil as possible using existing technologies. There is no horizontal drilling, no fracking costs, or oil production delays while fracking fluids are recovered and best of all, these wells are conventional, so their depletion rates are lower than shale. If successful, the six wells will be expanded to 10 in Q1 and Q2, growing production to 200 to 300 bopd. Then repeat. Advantagewon's current land holdings could provide as many as 100 locations.

Conclusion

The dramatic increase in US oil production has most observers closely watching the shale reservoirs to see if producers can deliver their intended outputs. The results will be interesting, not just to see whether the US can

exceed 11 million barrels of oil a day and become the planet's number one oil producer – giving Donald Trump something else to brag about – but also how continuing strong US output will affect oil prices and the dynamic between the United States and OPEC.

But there's another dynamic at play here, that many investors have missed.



Shale oil really isn't the place to be if your goal is make a return on investment. Shale producers are burning cash, their reservoirs are depleting fast, and pretty soon their investors and lenders are going to tire of supporting them as they continue to lose money.

Consider the cost of new shale cube drilling methods, reported as high as US$120,000,000.00, with stacking wells on all the different pay zones production might increase temporarily, but it seems to your author reserves are depleted that much quicker. And no junior can afford to play that game.

Consider Canadian exploration has ground to a halt. Junior O&G companies can’t exist in Canada. OPEC watch’s as the US burns through its oil and gas resources. The world watches as the US sells off its oil stock pile, even its Strategic Petroleum Reserve is being sold to, among others, China at firesale prices.

What happens when the shale naysayers, me included, are proven right and US oil production levels start to crater when the new ‘Cube’ technology fails to deliver the necessary production to run faster for much longer? Of course, with production rates dropping at up to a eye popping 70% in the first year or so of production it will not take investors long to see the writing on the wall. From boom to bust but of course OPEC will be glad to sell its oil to

America. At US$200 a barrel.

Without the infusion of new capital, forced by market needs to meet production estimates, the “shale resource” strategy would be hard pressed to survive. The business, if forced to grow organically, through cash flow alone would struggle. To me, shale is dead, and I'm looking elsewhere to invest my oil dollars.

Advantagewon Oil Corp (CSE:AOC) has a great model for drilling conventional long life wells at low cost, getting fast payback, earning oil revenue, then repeating the process somewhere else. They break even at 60 bopd at lower then current prices, could be between 300 and 500 per day by the end of the year, and are one of the very few juniors left out there to invest in. And they are run by Charles Dove, who has ‘been there, done that.’ What’s not to like?

I've got AOC on my radar screen as they begin drilling and start growing their barrels per day.

Do you? If not, perhaps you should.

Richard (Rick) Mills

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