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Energy Tidbits

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Produced by: Dan Tsubouchi

Saudi's Al Falih Points To Oil Supply Increase In July With An "Uptick In Real Demand"

Welcome to new Energy Tidbits memo readers. We are continuing to add new readers to our Energy Tidbits memo and energy blogs. The focus and concept for the memo was set in 1999 with input from PMs, who were looking for research (both positive and negative items) that helped them shape their investment thesis to the energy space, and not focusing on day to day trading. Our priority was and still is to not just report on events, but interpret and point out implications therefrom. The best example is our review of investor days, conferences and earnings calls focusing on sector developments that are relevant to the sector and not just a specific company results/guidance. Our target is to write on 48 to 50 weekends per year and to send out by noon mountain time.

This week's memo highlights:

1. Our 3 blogs on the US decision to not extend Iran waivers on May 2 and to move to cut Iran's exports to zero. (Click Here)

2. Saudi Energy Minister al Falih notes could see an uptick in real demand, which would provide the basis for an oil supply increase in July. (Click Here)

3. Putin indicates no OPEC+ actions on May 2, but doesn't take away the likelihood OPEC + increase supply on July 1. (Click Here)

4. The halt of Druzhba ~1 mmb/d oil deliveries to Europe should be fixed in 2 weeks. (Click Here)

5. Did Iran soften its stance on the Strait of Hormuz? (Click Here)

6. Service company Q1 calls point to slower than expected ramp up in US oil activity and likely growth. (Click Here)

7. Please follow us on Twitter at [LINK] for breaking news that ultimately ends up in the weekly Energy Tidbits memo.

8. For new readers to our Energy Tidbits and our blogs, you will need to sign up at our blog sign up to receive future Energy Tidbits memos. The sign up is available at [LINK].

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Natural Gas – Natural gas injection of 92 bcf, storage now at 55 YoY surplus

YoY storage now at 55 bcf YoY surplus

This week, the EIA reported a 92 bcf injection which was in line with expectations of an 85 bcf injection to bring storage to 1.339 tcf as of Apr 19. As expected, gas storage is now at a YoY surplus, with storage up 55 bcf YoY, but down 369 bcf vs the 5-year average. This eliminated the YoY deficit, so no surprise HH gas prices are down to approx. $2.50. Strong YoY US natural gas production growth means storage should continue to widen the YoY surplus and keep HH gas prices weak thru the shoulder season. Below is the EIA's storage table from its Weekly Natural Gas Storage Report. [LINK]

Figure 1: US Natural Gas Storage

	Stocks billion cubic feet (Bcf)				Historical Comparisons			
					Year ago (04/19/18)		5-year average (2014-18)	
Region	04/19/19	04/12/19	net change	implied flow	Bcf	% change	Bcf	% change
East	251	228	23	23	205	22.4	277	-9.4
Midwest	264	254	10	10	213	23.9	338	-21.9
Mountain	70	66	4	4	84	-16.7	117	-40.2
Pacific	138	128	10	10	177	-22.0	216	-36.1
South Central	616	571	45	45	604	2.0	761	-19.1
Salt	204	187	17	17	182	12.1	227	-10.1
Nonsalt	413	384	29	29	421	-1.9	533	-22.5
Total	**1,339**	**1,247**	**92**	**92**	**1,284**	**4.3**	**1,708**	**-21.6**

Source: EIA

Natural Gas – Mild winter leads to low YoY growth in China LNG imports

China Q1/19 LNG Mar imports +1.4 bcf/d YoY

There was more data to show why LNG prices are weak and why LNG cargos are being redirected from Asia into NW Europe. This week, the General Administration of Customs in China released its import data for Mar 2019. On Tues morning, we tweeted [LINK] "*More data to show why LNG prices are weak. China LNG imports in Mar/19 were 6.3 bcf/d (Bloomberg "CLGIIQTL"), sounds okay at +24.7% YoY. But China's mild winter reduced LNG import growth. China LNG imports Q1/19 were +1.4 bcf/d YoY, whereas Q1/18 were +2.4 bcf/d YoY.*" Our tweet also included our running China LNG import table.

Figure 2: US Natural Gas Storage

bcf/d	2016	2017	17/16	2018	18/17	2019	19/18
Jan	3.8	5.4	39.3%	8.0	50.0%	10.2	27.0%
Feb	3.1	4.1	32.3%	6.8	66.9%	7.5	9.0%
Mar	2.6	3.1	17.7%	5.0	64.5%	6.3	24.9%
Apr	3.0	3.4	14.7%	5.4	57.8%		
May	2.2	4.5	104.5%	6.9	53.3%		
June	3.5	4.9	38.2%	6.3	30.4%		
July	2.5	4.8	95.1%	6.4	33.9%		
Aug	3.5	4.9	37.4%	7.3	50.0%		
Sept	4.1	5.5	36.8%	7.0	26.3%		
Oct	2.9	5.5	93.0%	7.1	29.6%		
Nov	4.3	6.5	52.6%	9.6	47.5%		
Dec	5.8	7.8	34.5%	9.7	24.9%		

Source: Bloomberg, LNG World News

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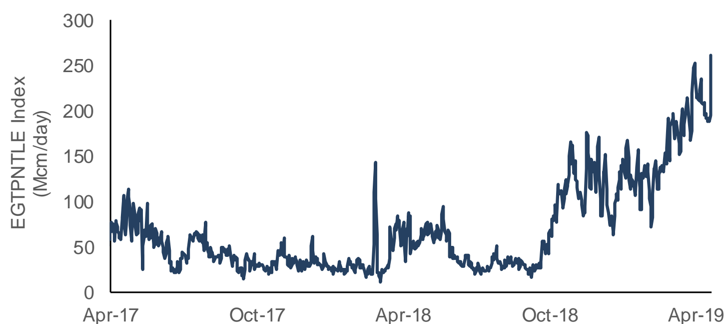
Natural Gas – Net LNG inflows into NW Europe are +7.5 bcf/d YoY

Net LNG flows to NW Europe +7.5 bcf/d YoY

The best indicator for the winter LNG surplus is YoY increases in net LNG flows in to NW Europe. This is a theme we have highlighted since our Sept 20, 2017 blog "*Shell: "Every LNG Cargo That Could Technically Be Produced In This World Has Been Produced And Has Found A Well Paying Customer*" [LINK]. NW Europe tends to be a dumping ground for surplus LNG, with Asian buyers redirecting cargos of surplus LNG. We have been monitoring NW LNG storage levels and there have been huge YoY net LNG inflows into NW Europe, especially in the past two months. Below is a graph of net LNG flows to NW Europe, which shows the current LNG inflows as of Apr 24, 2019 were 9.2 bcf/d, which is up 7.5 bcf/d YoY vs 1.8 bcf/d on Apr 24, 2018.

Figure 3: Net LNG Flows To NW Europe



Source: Bloomberg

Natural Gas – A slight push back in timing for Qatar's 4.4 bcf/d expansion?

A delay to Qatar LNG expansion?

It is subtle, but it looks like the new disclosure from Qatar Petroleum for its 4.4 bcf/d LNG expansion has slipped a bit from its prior disclosure of "by 2024" to its new disclosure of "in 2024". This compares to the Oct 2018 comments from Qatar Petroleum CEO Saad Sherida Al-Kaabi saying "*We are continuing our legacy and growth by recently announcing our decision to increase Qatar's LNG production capacity to 110 MTA by 2024"* This week [LINK], Qatar Petroleum announced it issued an invitation to tender on the construction of up to 100 new LNG carriers, with initial delivery of 60 LNG carriers to cover covers the offtake shipping requirements for Qatar's new North Field Expansion project. The release said Qatar's 4.4 bcf/d North Field Expansion project is to be *"Starting in 2024"*. Our takeaway from these comments, is a slight timing pushback from pre-2024 to sometime in 2024, which is in line with comments from Conoco Phillips as our Feb 10, 2019 Energy Tidbits said "*There was an interesting Qatar LNG expansion timing tidbit from the Conoco Q4 call last Thurs that suggests the Qatar LNG expansion looks to be later than prior Qatar Petroleum comments. Interesting disclosure in the Q&A. The last we recall seeing was that it was pre-2024. But in the Conoco Q4 Q&A, mgmt. was asked when they saw first production from the Qatar LNG expansion if they go forward with Qatar. Mgmt replied "<A - Matthew J. Fox>: I think the timeline will be first production between 2024 and 2025 is when the expectations are. Engineering design is already underway. And the – it's now being slowed down for the waiting for the final participants to be agreed. So it will be sometime late 2024 or early 2025 is when we would expect that to come to market."* Conoco reports Q1 earnings on Apr 30, and we will be looking for comments regarding timing of the Qatar LNG expansion project.

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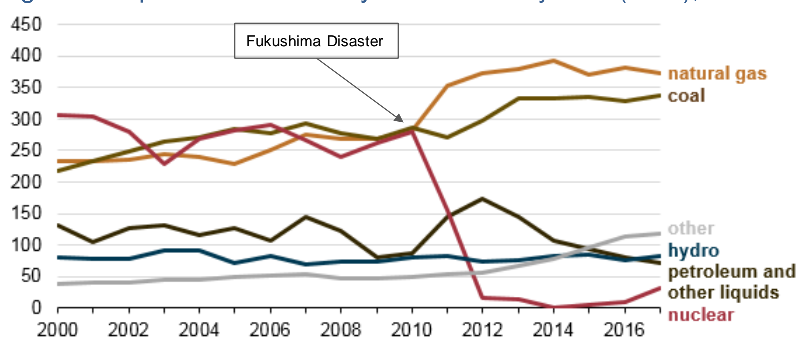
Natural Gas – Japan's nuclear return may be a little less than expected

Japan nuclear restarts face headwinds

Japan continues to try to bring back more nuclear power, but it looks like the nuclear power return will be a little bit less than expected. We put this item in the natural gas section as any return of nuclear power is expected to firstly hit LNG imports. This week, Japan's Nuclear Regulation Authority (NRA) refused to extend deadlines for utilities to install emergency facilities for nuclear reactors [LINK]. The deadlines differ for each reactor, but failure to build emergency anti-terrorism features prior to the respective deadlines means the NRA will shut down nuclear reactors. On Fri, Bloomberg Terminal story *"Japan LNG Use to Rise If Anti-Terror Rules Shut Reactors"* reported that up to 13 reactors are at risk of remaining shut down if they miss the deadlines. Japan is attempting to reduce coal fired generation, so reduced nuclear power generation growth means the big winner will natural gas. Bloomberg estimates the resulting impact to Japan utilities incremental LNG demand could increase 2%-5% (0.2-0.5 bcf/d) during 2020-2023. Below is a graph we included in last week's Energy Tidbits memo, showing the huge decrease in nuclear power generation following the Fukushima disaster.

Figure 4: Japan's Net Electricity Generation By Fuel (TWh), 2000-2017



Source: EIA, SAF

Natural Gas – Will Kitimat LNG FID be pushed back if Chevron wins Anadarko?

Potential Kitimat LNG delays?

We have to believer western Cdn natural gas producers are hoping Chevron doesn't get Anadarko. After reviewing the Chevron Q1 call on Friday, we have to wonder happens to Kitimat LNG if they win Anadarko. We have been highlighting the positive Chevron and Woodside comments on Kitimat LNG in the past two months and how this was pointing to a FID within the next year. We believe the momentum was moving to FID, but wonder if a potential FID is pushed out until after 2020? There was zero mention of Kitimat LNG or any changes to Chevron's capex plans in the Q1 call. But a few things got me thinking about it – increasing buybacks, will be cutting capex from the pre deal capex for both companies, the cut projects "maybe not the same ones that satisfied that criteria in the past", and they will be going ahead on Mozambique LNG. (i) Post a deal, they plan to increase buybacks. Mgmt said "The transaction will increase from a run rate of $3 billion last year to and run rate of $4 billion this year and so the step up to $5 billion was a signal that this deal makes us even stronger. (ii) They plan to reduce the planned capex spend of the two companies. They were asked about the billions of capital efficiencies and replied "Alright. I'll be quick. So you can comply. So we got a different portfolio and we will look to make some decisions on those assets that really will compete for capital that offer the resource potential, and the value for our shareholders over time. What those -- what we'll disclose as we get into transactions. The capital that we've indicated -- you should think of it as both reductions in spend between the two companies and efficiency in that spend, so we'll look at contracts and the ability to execute and to drive capital efficiency into the system and also drive overall spend down".

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(iii) They seem to hint that some of the Chevron projects will be included in the cutback of capex. In the Q&A, mgmt. replied "We are continuing always looking to high grade the portfolio from a strategic alignment standpoint, the ability to compete for capital what the assets are, that will allow us to compete and deliver strong returns into the future. And oftentimes, those maybe not be the same ones that satisfied that criteria in the past." (iv) Mozambique is a world class asset. In the Q&A, mgmt. replied "*Sure. As I discussed on the call, a couple of weeks ago, we view Mozambique [ph] as a world-class gas resource. We are pleased with the progress of the products is made. It's a very cost competitive, LNG project and that matters. We do not intend to slow the projects timeline down. We think that there is a good team of people working on this and that they've done a good job, I plan to visit Mozambique soon to see the site and visit with both government leaders and people working on the projects there and we think that's this fits well into our portfolio and with our strengths and so we like the project. We think we can bring some value. We've got a balance sheet to support the project, we've got experience in things like shipping that -- this will have a large shipping components. So I think there are ways we can improve and enhance execution in value and mitigate risk in execution of the project.*" Our Supplemental Documents package includes excerpts from the Chevron Q1 call transcript.

Natural Gas – Offshore Egypt continues to be a game changer to LNG markets

Another major Egypt gas discovery?

Offshore Egypt natural gas should continue to be on all radar screens. Egypt was off natural gas/LNG screens until Sept 2015, when Eni made the Zohr natural gas discovery. We don't highlight many individual exploration discoveries but we did Zohr as it was a game changer to offshore Egypt. Zohr is going to be 0 to 3.2 bcf/d in 3.5 yrs. And its much more than Zohr, there are many "other" smaller than Zohr, but still big natural gas fields that will come onstream quickly and be hitting Europe and other markets. These "other" discoveries are big and generally the size of a LNG project and have quicker cycle times. These "other" discoveries are real risks to US LNG and east coast Canada LNG projects competing into Europe. The most significant disclosure from Eni's Q1 results on Thurs was its latest offshore Egypt natural gas discovery. It didn't get much attention because there isn't any information on this discovery other than the potential 90 meter gas column. We don't know how big this discovery is, it can't be a Zohr 3.2 bcf/d, but could it be something close to a Nooros 1.2 bcf/d? If so, that compares to LNG Canada phase 1 of 1.8 bcf/d or Pieridae Goldboro 1.3 bcf/d. In the Q1 report, ENI wrote "a *gas discovery was made in the exploration permit Nour in the Egyptian Mediterranean Sea, operated by Eni (40%)."* Eni press release Mar 14, 2019 "*Eni announces a new gas discovery under evaluation in the Nour exploration prospect located in the Nour North Sinai Concession, in the Eastern Egyptian Mediterranean, about 50 km North of the Sinai peninsula. The Nour-1 New Field Wildcat (NFW), which has led to the discovery, was drilled by the Scarabeo-9 semi-sub in a water depth of 295 meters and reached a total depth of 5,914 meters. Nour-1 well found 33 meters of gross sandstone pay with good petrophysical properties and an estimated gas column of 90 meters in the Tineh formation of Oligocene age. The well has not been tested, however an intense and accurate data acquisition has been carried out.*" There has been no estimates of potential reserves side. But from a pay perspective, the 90 meter gas column from a sandstone is a fraction of the massive Zohr discovery over 400 meters net pay, but compares, on a pay thickness basis, with the 65 meter thick sandstone for Nooros. On Feb 28, 2019, the Petroleum Economist posted a story "*Egypt's gas gold rush*" [LINK] that included "*Nour giant? Eni and Egypt decline to speculate on whether Nour, as rumours suggest, is greater still than the 30tn ft³ of gas in place at Zohr, but the upstream has never looked so promising*". The other interesting aspect of Nour is that it is located at the eastern boundary of the offshore Egypt area and looks to open up more of the eastern side. Below is a Petroleum Economist

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map. Our Supplemental Documents package includes the Eni March 14 release and the Petroleum Economist story. [LINK]

Figure 5: Egypt Offshore Natural Gas Fields

Source: Petroleum Economist

Oil – US oil rigs down 20 to 805 oil rigs

US oil rigs were -20 this week

On Friday, Baker Hughes reported its weekly rig data which was generally positive for oil prices. Us oil rigs were down 20 to 805 oil rigs as of Apr 26. Increases were in Mississippian +2. Decreases were in Others -9, Permian -3, Eagle Ford -3, Williston -3, Cana Woodford -2, DJ-Niobrara -1, and Granite Wash -1. US oil rig activity has been slowing in 2019, which is in line with recent Q1 call comments this week from Halliburton, Helmerich & Payne and Patterson UTI all seeing drilling to further decline in Q2/19. Below is our graph of the Baker Hughes weekly US oil rig data.

Figure 6: Baker Hughes Weekly Rig Count – Total US Oil Rigs

Source: Baker Hughes, SAF

Oil – Total Cdn rigs down 3 to 63 total rigs

Total Cdn rigs down 3 this week

Baker Hughes reported Cdn rigs were down 3 to 63 total rigs as of Apr 26. Canadian drilling activity always reaches its low during spring breakup, and we have likely bottomed out, or are near the bottom level of spring drilling activity for 2019. Cdn oil rigs were flat at 19 oil rigs, which is down 14 YoY. Last year, Cdn oil rigs bottomed out at 32 oil rigs on May 11, whereas we are currently sitting at 19 active Cdn oil rigs in 2019. Cdn gas rigs were down 3 to 44 Cdn

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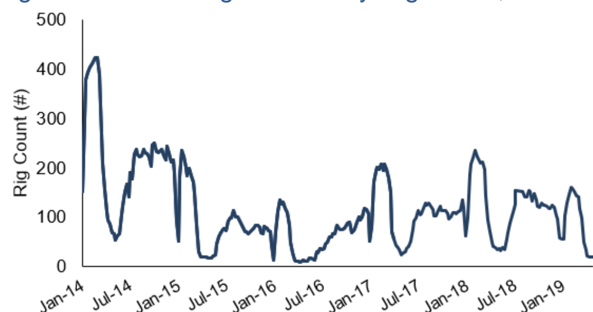
gas rigs, vs last spring's bottom of 43 gas rigs on June 1. Below is our graph of the Baker Hughes weekly Cdn oil rig data.

Figure 7: Baker Hughes Weekly Rig Count, Canadian Oil Rigs



Source: Baker Hughes, SAF

Oil – EIA says US oil production up 100,000 b/d to 12.2 mmb/d

US production at 12.2 mmb/d

EIA reported US oil production was back to the all time record of 12.2 mmb/d for the Apr 19 week, up 100,000 b/d from 12.1 mmb/d for the Apr 12 week. Lower 48 production was also back to the all time record of 11.7 mmb/d for the Apr 19 week, up 100,000 from 11.6 mmb/d for the Apr 12 week. Note the new STEO for Apr has average Q2 oil production at 12.36 mmb/d, 160,000 above this week's estimate. We should expect to see US oil production increase towards the back end of Q2 as Permian egress is unlocked moving into Q3. The recently completed Seminole NGL Pipeline Reversal allows for an incremental 200,000 b/d out of the Permian, and the 585,000 b/d Cactus II pipeline is set for interim service in Q3. Below we pasted an excerpt from the EIA weekly oil production data. [LINK]

Figure 8: Weekly Oil Production

Year-Month	Week 1		Week 2		Week 3		Week 4		Week 5	
	End Date	Value	End Date	Value	End Date	Value	End Date	Value	End Date	Value
2017-Jan	01/06	8,946	01/13	8,944	01/20	8,961	01/27	8,915		
2017-Feb	02/03	8,978	02/10	8,977	02/17	9,001	02/24	9,032		
2017-Mar	03/03	9,088	03/10	9,109	03/17	9,129	03/24	9,147	03/31	9,199
2017-Apr	04/07	9,235	04/14	9,252	04/21	9,265	04/28	9,293		
2017-May	05/05	9,314	05/12	9,305	05/19	9,320	05/26	9,342		
2017-Jun	06/02	9,318	06/09	9,330	06/16	9,350	06/23	9,250	06/30	9,338
2017-Jul	07/07	9,397	07/14	9,429	07/21	9,410	07/28	9,430		
2017-Aug	08/04	9,423	08/11	9,502	08/18	9,528	08/25	9,530		
2017-Sep	09/01	8,781	09/08	9,353	09/15	9,510	09/22	9,547	09/29	9,561
2017-Oct	10/06	9,480	10/13	8,406	10/20	9,507	10/27	9,553		
2017-Nov	11/03	9,620	11/10	9,645	11/17	9,658	11/24	9,682		
2017-Dec	12/01	9,707	12/08	9,780	12/15	9,789	12/22	9,754	12/29	9,782
2018-Jan	01/05	9,492	01/12	9,750	01/19	9,878	01/26	9,919		
2018-Feb	02/02	10,251	02/09	10,271	02/16	10,270	02/23	10,283		
2018-Mar	03/02	10,369	03/09	10,381	03/16	10,407	03/23	10,433	03/30	10,460
2018-Apr	04/06	10,525	04/13	10,540	04/20	10,586	04/27	10,619		
2018-May	05/04	10,703	05/11	10,723	05/18	10,725	05/25	10,769		
2018-Jun	06/01	10,800	06/08	10,900	06/15	10,900	06/22	10,900	06/29	10,900
2018-Jul	07/06	10,900	07/13	11,000	07/20	11,000	07/27	10,900		
2018-Aug	08/03	10,800	08/10	10,900	08/17	11,000	08/24	11,000	08/31	11,000
2018-Sep	09/07	10,900	09/14	11,000	09/21	11,100	09/28	11,100		
2018-Oct	10/05	11,200	10/12	10,900	10/19	10,900	10/26	11,200		
2018-Nov	11/02	11,600	11/09	11,700	11/16	11,700	11/23	11,700	11/30	11,700
2018-Dec	12/07	11,600	12/14	11,600	12/21	11,700	12/28	11,700		
2019-Jan	01/04	11,700	01/11	11,900	01/18	11,900	01/25	11,900		
2019-Feb	02/01	11,900	02/08	11,900	02/15	12,000	02/22	12,100		
2019-Mar	03/01	12,100	03/08	12,000	03/15	12,100	03/22	12,100	03/29	12,200
2019-Apr	04/05	12,200	04/12	12,100	04/19	12,200				

Source: EIA

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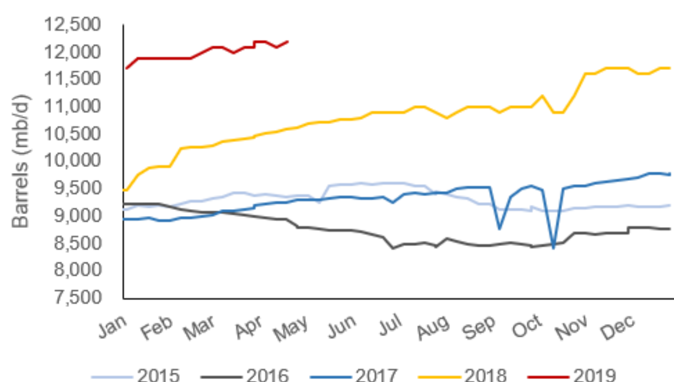
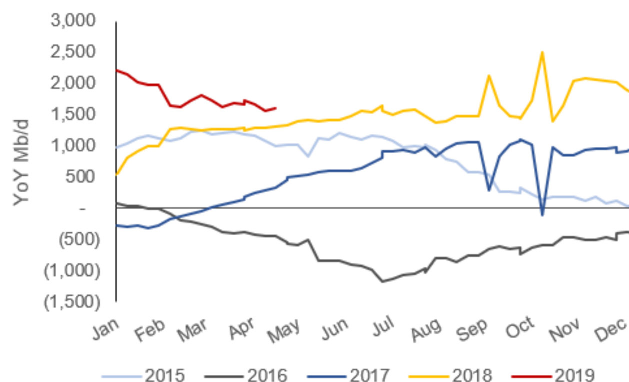
Figure 9: US Weekly Oil Production



Source: EIA, SAF

Figure 10: YoY Change in US Weekly Oil Production



Source: EIA, SAF

Oil – Are the service companies pointing to lower or slower US oil growth in 2019?

Slower US growth in 2019?

One of our two key oil outlook questions from the US service company Q1 calls (Halliburton, Helmerich & Payne, National Oilwell, and Patterson UTI) this week was wondering if they are point to lower than expected and/or slower than expected growth in US shale oil in 2019? US shale oil growth is likely the biggest risk/upside to oil prices. The three service company comments were similar. (i) Not seeing operators increase capex budgets despite the stronger oil prices of late and looking forward. Remember at the end of 2019, WTI strips were closer to $45 than $50 for 2019 and 2020, and now they are over $60. (ii) See industry activity going lower in Q2, but Q2 should be the bottom for the year. (iii) The stronger YoY oil prices are not expected to lead to a YoY increase in activity, rather less of a YoY decrease. (iv) There was one other linked point from the Halliburton call, where Halliburton seemed to say that operators have to crank it up to hit their production targets. Mgmt said "*More specifically around the second half of the year, a couple of ways we think about that, but I think importantly is the production targets that are out there today, all of that requires some level of completion activity to meet that*." (v) National Oilwell's Q1 call on Fri specifically warned on this risk. We tweeted [LINK] "*Drillers say drilling to bottom in Q2, increase in Q3. National Oilwell Q1 call - customer drill pipe inventory @ 10 yr low, deliveries pushed to Q2*

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or Q3, "consuming drill pipe daily and they won't be able to drill when they run out". Oil growth ramp up slower than expected?"

Oil – Is Halliburton's focus on tier 2 acreage indicate lower US oil growth post 2020?

Lower US oil growth post 2020?

We believe the US oil issue that will get the most scrutiny in 2019 will be the how much more and at what pace can US shale oil grow in the out years ie. 2020 thru 2023. It will get more attention in the summer and then certainly in Sept as markets look more to 2020. Its inevitable for this to get scrutiny, its like everyone calling the end of the bull market. In listening to the Halliburton Q1 call, by no means did mgmt. come out and say lower US oil growth was a concern, at least not directly. But when we hear mgmt. highlight one of their focuses is working to get more out of tier 2 acreage, we have to believe it is because their customers are focusing on this question. We don't believe Haliburton would be emphasizing this if this wasn't a concern or focus for their customers. Mgmt said "*As shale matures and operators have to step out to second-tier acreage, it will become increasingly hard to add enough production capacity to replace the significant legacy decline volumes as well as drive new production higher. Going forward, higher activity and more advanced technology will be needed to maintain flat production levels in unconventionals. In light of this, I firmly believe that the future of unconventional technology will be more heavily weighted towards enabling higher well productivity. As I've told you before, Halliburton's first step in this direction is investing in the Prodigi fracturing automation platform. We are using the latest machine learning technology to make our hydraulic fracturing treatment smarter and help our customers achieve optimal production from tougher and deeper rock*."

Oil – Did Sohi set the stage for no Liberal TMX decision until Nov if at all?

Liberals setting the stage for a TMX change?

We have to wonder if the Liberals are setting the stage for a changed position on the Trans Mountain expansion. Lately, we have been giving the Liberals, in particular Natural Resources Minister Sohi, credit for looking to be supportive of progressing Trans Mountain expansion. Readers will know that we are skeptics on how much the Liberals really want to push Trans Mountain expansion, especially ahead of the Oct 2019 election. We were reminded of this with the National Post story "*John Ivison: Trudeau itching for a fight if Jason Kenney overturns pledge to cap oilsands emissions*" [LINK] "*Sources suggest the Trudeau government is actively considering the idea of blocking the expansion of the Trans Mountain pipeline, which the federal government owns, if Kenney's Alberta government overturns a pledge by its predecessor to cap carbon emissions from the oilsands at 100 megatons a year. The logic is that if there is no climate change plan, there can be no more pipelines – a commitment that would likely play well in British Columbia and Quebec, where the Liberals believe they can pick up seats in the October election".* We wouldn't have included this item today, if we hadn't subsequently seen the National Post story by a different writer "*Federal decision on Trans Mountain pipeline before election not guaranteed: Sohi*" [LINK]. Sohi has seemed to be pretty straight in his comments throughout the TMX process, which is why we try to pay attention to Sohi's comments. And after reading the story, we wondered if Sohi was tipping us to the Liberals plan to not decide on TMX until after the election. Sohi says *""I'm very confident that by June 18, cabinet will be able to make a decision on this project*", which is consistent with his prior position. But then the National Post reports that he added a qualifier that we hadn't seen before. The National Post wrote "*But despite the deadline, Sohi wouldn't guarantee a decision would come before the next federal election expected this fall. "No, I cannot commit to that because it's not my decision. It's the decision of the cabinet," he said".* We can understand him saying that a decision may take some days or a couple weeks post the June 18 recommendation, but to see the National Post write that he couldn't guarantee a decision (no what the decision is, but a decision) within 4 months was a surprise. This is a significant change in messaging and we always believe politicians try to set the

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stage for a position change. We don't know why Sohi would say this unless he was setting the stage for a policy change that, in this case, would be no decision on TMX until after the election?. Our Supplemental Documents package includes the National Post stories.

Oil – Forward strips ~$47 for 2019 at yr end led to Permian job losses in Jan/Feb

Lower year end oil prices led to Permian job losses

The expectations for oil prices to be closer to $45 than $50 for 2019 and 2020 at the end of 2019 led to lower activity levels to start 2019 and also to Permian job losses. This week, the Federal Reserve Bank of Dallas published its updated Permian Basin Economic Indicators for Apr [LINK]. According to the report, the Permian's Mining, logging & Construction sector fell 12.2% in the Nov 2018 to Feb 2019 period and note, oil and gas is included in the Mining, logging & Construction sector. The good news is that the service company Q1 calls are calling a bottom in activity in Q2, and we should start to see the job gains in H2/19.

Oil – No surprise, Cdn crude by rail exports down 194,935 b/d MoM to 130,564 in Feb

Feb Cdn CBR exports down 194,935 MoM

The National Energy Board reported Canadian crude by rail exports were down big in Feb. Feb CBR volumes of 130,564 b/d, which is down 194,935 b/d from 325,499 b/d in Jan and down 3,511 b/d YoY vs 134,075 b/d in Feb 2018. This was expected and shouldn't have surprised anyone as in particular it was driven by the cold Feb weather. Below is the NEB's crude oil exports by rail monthly table. [LINK]

Figure 11: Canadian Crude Oil Exports By Rail

Year	Month	Volume (m3)	Volume (m³ per day)	Volume (bbl)	Volume (bbl per day)
2019	February	580,943	20,748	3,655,788	130,564
	January	1,603,480	51,725	10,090,472	325,499
2018	December	1,742,842	56,221	10,967,456	353,789
	November	1,575,116	52,504	9,911,979	330,399
	October	1,661,418	53,594	10,455,066	337,260
	September	1,305,572	43,519	8,215,778	273,859
	August	1,153,709	37,216	7,260,124	234,198
	July	1,037,545	33,469	6,529,120	210,617
	June	994,033	33,134	6,255,307	208,510
	May	979,178	31,586	6,161,830	198,769
	April	922,323	30,744	5,804,048	193,468
	March	840,522	27,114	5,289,282	170,622
	February	596,565	21,306	3,754,096	134,075
	January	717,684	23,151	4,516,283	145,687
2017	December	748,489	24,145	4,710,133	151,940
	November	707,046	23,568	4,449,337	148,311
	October	675,768	21,799	4,252,509	137,178
	September	639,449	21,315	4,023,963	134,132
	August	590,833	19,059	3,718,026	119,936
	July	455,925	14,707	2,869,071	92,551
	June	522,049	17,402	3,285,182	109,506
	May	644,920	20,804	4,058,391	130,916
	April	714,633	23,821	4,497,084	149,903
	March	766,789	24,735	4,825,292	155,655
	February	590,415	21,086	3,715,400	132,693

Source: National Energy Board

Reminder CN warned in Feb of the big hit to crude by rail from cold weather

This NEB data should have been expected as there were clear warnings from CN in Feb. Our Feb 24, 2019 Energy Tidbits memo noted CN's comments that crude by

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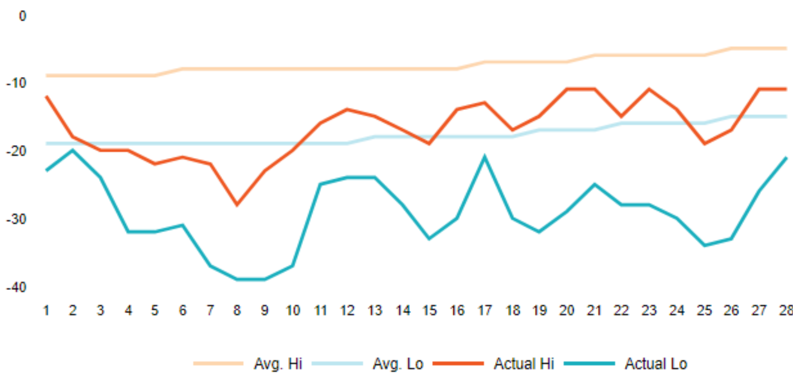
rail volumes could be cut in half. In that memo, we said *“CN presented at a US sell side conference on Thurs and mgmt. discussed the very cold weather to start Feb and how that created Tier 3 weather days – the worst operating cold conditions. This means that they have to cut the loads down by about half. Cold weather means CN has to cut train length and therefore require more tank cars, locomotives and train crews to move the same volume. If they are already at or near capacity, they, can’t increase and therefore volume has to go down. This has to have a huge impact on Feb volumes. CN said January “volumes were strong”, but cold weather hit the first 10 days of Feb. Mgmt said “A - Ghislain Houle>: So they're 10 days. I think we're slowly, but surely coming out of that. And when you're a railroad – I know we've been around for 50 years – as long as the train braking system will be air-driven, when you've got again minus 35 degrees Celsius or, just for people, I think at minus 35 it converges to minus 35 Fahrenheit... <Q - Chris Wetherbee>: Yeah. <A - Ghislain Houle>: ...and then we have it on a sustained basis, no matter how much you invest, you're going to have to reduce the size of your train and you're going to get a little bit on your knees. But again, I want to reassure investors that this is 10 days. <Q - Chris Wetherbee>: Yeah. <A - Ghislain Houle>: So we're getting out of it. We've got some backlog now that we are moving… And to Keith's point, when you look at the number of days that we were under a Tier 3; Tier 3 means that we have to reduce the size of our train by half, so which means that we need double the number of trains to move the same amount of volume.” We suspect CN mgmt. was referring to moving their trains on their mainline thru Manitoba with the -35c reference. We expect one of the primary routes for CN cdn crude by rail will be to move thru Brandon (Manitoba)”*. Below is the Accuweather temperature chart for Brandon for Feb and the CN winter 2018 train length guide.

Figure12: Brandon Manitoba Temperatures For Feb 2019



Source: Accuweather

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Figure 13: CN Bulk Train Length Guidelines

Carload Winter Operations
Bulk Train Length Guidelines

- Average train length during regular operating conditions is ~ 12,000 feet
- Extreme weather conditions result in train length restrictions
- More trains must be deployed to handle same volume
  - Additional locomotives and train crews are required
- These temporary train length restrictions ensure safe train operations

Train Type		Temperature Range	Conventional	Distributed Power
Bulk	Tier 1	-25 to -30C or -13 to -22F	2438 m / 8000 ft	11000 ft
	Tier 2	-30 to -35C or -22 to -31F	1830 m / 6000 ft	9000 ft
	Tier 3	-35 to -39C or -31 to -38F	1375 m / 4500 ft	7500 ft
	Tier 4	Colder than -40C or -40F	train operations are stopped	

Source: CN

Oil – No surprise CP crude by rail hit hard by weather in Q1

CP Feb crude by rail hit hard by weather

CP held its Q1 call on Tues. (i) No one should have been surprised to see CP's big drop in crude by rail in Q1. We have been hammering home this point on how cold weather reduces the crude by rail capacity by ~50%. And then throw in some voluntary reductions from industry in light of the curtailments. CP said "*Last in this space, the crude by rail volumes slumped sequentially to 17,000 carloads as a result of production curtailments and the tough operating conditions. While under the current circumstances, crude by rail remains highly variable, we are optimistic that volumes will gradually ramp up as new contracts start up and our existing customers resume shipping. We are definitely seeing increased demand for Q2 and expect the volume to continue to ramp up as we move through 2019*." (ii) Some added costs that we have to believe ultimately get allocated. CP notes a 4 fold increase in casualty. ""*The primary driver behind the increase was casualty, which was CAD69 million in the quarter. To put that figure into perspective, our average casualty on a full-year basis is typically around CAD70 million. The increase year-over-year was a little bit over CAD50 million.*" (iii) Still see a 2 to 3 year crude by rail opportunity. In the Q&A, mgmt. replied "*Yeah. So look curtailments aside supply and production level versus takeaway levels crude by rail fundamentals are strong and in my view, even with Enbridge coming on, this still looks like a good, two to three year crude by rail opportunity. That being said, as it relates to the APMC contract just like we would do with any customer it was negotiated in certainly good faith and we feel good about it. And I can tell you this, Keith was on earlier today, we're looking at preparations on how we begin to ramp up for that with the expectation that we're going to -- we're going to be starting to haul it come here July. So those investments that we need to make whether it be in people or infrastructure are underway. I'll just comment, I'm not going to say a whole lot about the liquidated damages, other than I know we talked about it quite a bit on the last quarter call just other than sort of each contract we have structured a little differently on how those ultimately get paid, but the fundamental structure of those contracts are designed to backstop our investments, our cost of capital related to those contracts, and we feel good about those.*" (iv) Reminder that there are liquidated damages in the Alberta rail deal. Not too much on the potential for Kenney to cancel the crude by rail deal. Mgmt was asked if CP was agnostic on keeping or not keeping the Alberta rail deal "given the net effect of potential liability damages and maybe the spreads widening out if they dismantle it or the

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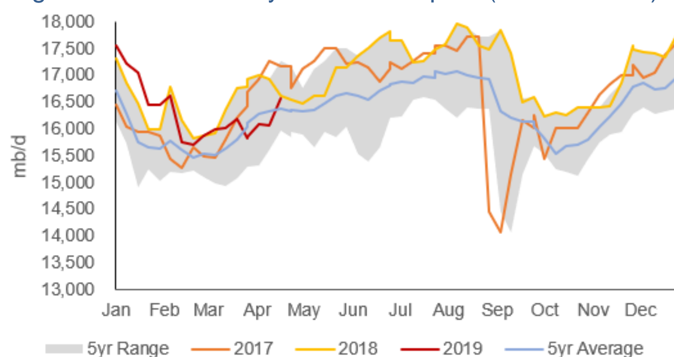
kind of guaranteed volumes if they keep it?" Mgmt relied "*Let me say this, we -- I'd say we spent, Ravi, a fair amount of time working with the Alberta government in putting this contract together and I didn't do it to have it be ripped up. As I said -- we're planning for it. We reserve the capacity to handle that business. Now, that being said, we want to work open minded with the Alberta government. If there's concerns or issues, we're more than happy to spend the time to work through that. At the end of the day, go back to sort of what I opened up within the subject -- the fundamentals under sort of what I call normal market conditions support crude by rail. So ultimately, if it's Alberta government or some other customer, I see a path to sort of these volumes over -- sort of the prolonged next two to three years. John Brooks, Executive Vice President and Chief Marketing Officer And Ravi, I'd just add that -- keep in mind, there is a number of companies within the supply chain, number of railroads beyond the Canadian railroads that are involved in this. So it's -- it takes a lot of companies to come together and create this supply chain that can provide value to Canada -- to Alberta as well. And I'd say that, we're also watching the curtailment closely. I'd say -- argue that that's more impactful to what's being produced, obviously, but that's more impactful to the economy and to what that means to Alberta and to Canada as a whole. So that's an important dynamic that we're watching very closely. So, I mean if you don't believe in regulation, well, curtailing the production and picking winners and losers is something that should also be addressed.*" Our Supplemental Documents package includes excerpts from the CP Q1 call transcript.

Oil – Oil input into refineries up 505,000 b/d to 16.583 mmb/d

Oil input into refineries up 505,000 b/d

Crude oil input to refineries were up returned closer to the normal seasonal level, with a big 505,000 b/d increase to 16.583 mmb/d for the Apr 19 week. This compares to last week, when crude oil inputs were down 22,000 b/d, and two weeks ago when crude inputs were down 251,000 b/d. Refinery utilization was up 2.4% this week to 90.1%. We are in the normal seasonal period when refinery utilization and crude oil inputs to refineries increase to the normal peak each year in Q3. And that will be the case in 2019. However, as has been signaled, we are expecting a higher than normal turnaround season in Q2 as refineries prepare for IMO 2020. US refinery demand will still be ramping up seasonally, but will likely be below last year's levels for the next few months. Below is our graph of the EIA weekly crude oil input to refineries.

Figure 14: US Refinery Crude Oil Inputs (thousand b/d)



Source: EIA, SAF

Oil – US "NET" oil imports down 659,000 b/d to 3.591 mmb/d

US NET oil imports down 659,000 b/d

US "NET" imports were up big, with an 877,000 b/d increase to 4.468 mmb/d for the Apr 19 week, compared to 3.591 mmb/d for the Apr 12 week. Imports were up 1.157 mmb/d to 7.149 mmb/d for the Apr 19 week, from 5.992 mmb/d last week. Exports were up 280,000

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b/d to 2.681 mmb/d for the Apr 19 week, from 2.401 mmb/d last week. The adjustment/plug number was big again this week. The adjustment item was +510,000 b/d for the Apr 19 week, whereas the adjustment was -467,000 b/d last week. Some items to note on the oil import by country data. (i) Canada was +273,000 b/d to 3.669 mmb/d, vs 3.396 mmb/d for the Apr 12 week. (ii) Saudi Arabia was up 384,000 b/d to 807,000 b/d this week, vs 423,000 b/d for the Apr 12 week. (iii) Mexico was down 395,000 b/d to 311,000 b/d for the Apr 19 week, compared to 706,000 b/d for the Apr 12 week. US imports of Saudi and Mexico oil seem to follow a pattern of up big one week, and down big the next, as was the case this week. (iv) Venezuela was up 120,000 b/d to 191,000 this week, from 71,000 b/d for the Apr 12 week. There is no color provided, but US sanctions allow US companies to import oil from PDVSA until Apr 28, 2019, provided the payments go into blocked accounts in the US. Below is our table of the US oil imports by major country.

Figure 15: US Weekly Preliminary Oil Imports By Major Countries

	Feb 15/19	Feb 22/19	Mar 1/19	Mar 8/19	Mar 15/19	Mar 22/19	Mar 29/19	Apr 5/19	Apr 12/19	Apr 19/19	WoW
Canada	3,288	3,047	3,553	3,389	3,518	3,447	3,212	3,424	3,396	3,669	273
Saudi Arabia	594	346	697	947	407	490	764	484	423	807	384
Venezuela	558	208	83	112	0	0	0	139	71	191	120
Mexico	911	460	915	615	712	463	574	937	706	311	-395
Colombia	388	349	292	326	421	479	451	389	248	485	237
Iraq	845	310	217	234	405	381	128	156	5	305	300
Ecuador	99	100	327	116	197	96	105	184	49	87	38
Nigeria	0	29	0	29	136	138	277	0	93	67	-26
Kuwait	138	176	111	47	69	288	124	43	43	82	39
Angola	0	0	0	0	0	0	0	0	0	0	0
Top 10	6,821	5,025	6,195	5,815	5,865	5,782	5,635	5,756	5,034	6,004	970
Others	701	892	806	931	1,067	758	1,128	843	958	1,145	187
Total US	7,522	5,917	7,001	6,746	6,932	6,540	6,763	6,599	5,992	7,149	1,157

Source: EIA, SAF

Oil – Our 3 blogs on US stopping waivers on Iran sanctions

SAF Group's three blogs on US stopping Iran waivers

The big news this week was the US announcing they weren't extending waivers to Iran sanctions and are moving to cut Iran's oil exports to zero. This will be the issue to dominate oil markets until OPEC+ decides what to do post the June 30 term of the OPEC+ cuts and when to do it. It is why we published three lengthy blogs. (i) Mon Apr 22 5:30pm "*Iran Sanctions – US Says No More Waivers, US/OPEC+ Can Closely Match Iran Exports To Zero*" [LINK] Our first blog tries to answer the question are there enough barrels to offset Iran's oil and condensate exports to zero? We think the answer is the added US and OPEC+ barrels can closely match a loss of Iran oil and condensate exports. (ii) Tues Apr 23 11:30am "*Iran Sanctions – US/OPEC+ Oil Export Increases Are Not Enough To Lower Oil Prices"* [LINK] Our second blog looked at the second key question, will the added barrels be enough to lower oil prices? If the new supply additions from US, Saudi Arabia, UAE and others only closely matches the Iran cut exports (assuming the US is successful in cutting to zero), we don't think that is enough unless there is also a major release of oil from the US SPR and/or Saudi Arabia oil inventories. If not, we believe the normal seasonal oil supply/demand fundamentals and the risk of production losses from Venezuela and Libya point to oil prices still gong higher. We see near term oil going $5 to $10 higher. (iii) Wed Apr 24 10:45am "*Iran Sanctions – What Are Key Potential Risks To Oil By The US Putting Iran's Back To The Wall?"* [LINK]. Our third blog looked at the key potential risks to oil by the US putting Iran's back to the wall. Iran's focus so far is to make the argument and get international support to not let the US force Iran's exports to zero. Its basically a negotiation and wait and see phase. If Iran is not successful in stopping the US cutting its exports to zero or very close thereto, it will bring focus to the two primary (and both significant) risks to the global oil supply chain – Iran in the Strait of Hormuz and its Houthis surrogates in the Bab el Mandeb/Red Sea. No surprise that in this phase, Iran threw out its normal warning on oil

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tankers thru the Strait of Hormuz if Iran can't export barrels. We may see some harassment and delays to tanker traffic from Iran, but we do not expect any official military action on a disaster scenario of Iran attacking tankers in the in the Strait of Hormuz leading to a war in the Persian Gulf. Any attack would be a desperation act and we believe there would be some signals of nearing that point in advance thereof. Rather we see the primary direct risk to the oil supply chain being Iran's surrogates, the Houthis. Lastly, we realize that there is no chatter for the potential of some sort of indirect negotiation, but we have to wonder if Iran was throwing out a feeler yesterday when it called the Strait of Hormuz an "international waterway" and not waters under Iran control/rights. More on this point in a later item in today's memo. Our Supplemental Documents package includes the three blogs.

Oil – Did Saudi agree with Trump to increase oil supply and, if so, when to do so?

Trump says Saudi agreed to increase oil supply

We should start by reiterating our view that the likelihood is for OPEC+ to increase oil supply, to some level, post the June 30 term of the current OPEC+ quota cuts. WTI was down 3.7% on Fri because of Trump's Fri morning comments to reporters *"I called up OPEC. I said, 'You've got to bring them down. You've got to bring them down,' and gasoline's coming down,"* and then he doubled down with a tweet [LINK] that started off "*Spoke to Saudi Arabia and others about increasing oil flow. All are in agreement*." Even Brent was down 3.4% in the face of losing 1 mmb/d of supply from Russia's Druzhba oil pipeline. It seemed that the market was interpreting the tweet as an immediate oil supply increase to offset more lost Iran barrels once the waivers end on May 2. By late Fri afternoon, there were multiple points such as the CNBC report [LINK] "*Top OPEC, Saudi officials didn't discuss lowering oil prices with Trump: report*" that said "*That conversation did not involve Saudi Arabia's crown price or energy minister, or OPEC's secretary general, sources told the Wall Street Journal".* No one should be surprised that the other side of a Trump interaction isn't in agreement with Trump's recap. We don't know who or what he said, but we see his tweet as likely him parsing together discussions over a period to make it seem they all had just happened ie. we have to believe he has specifically asked Saudi and others to increase supply over the past month in the leadup to May 2. We also suspect that he also chose to redefine or characterize Saudi's consistent messaging that it will do its analysis and focus is to maintain market stability as being they agreed to increase supply. We have to believe Saudi would have said to Trump that they will maintain market stability and if required by the market, they will increase supply but only after discussing with OPEC partners. And that they will be doing their analysis for the OPEC June meetings, review that data and then, along with its OPEC partners, make a decision to ensure the market is well supplied. If our belief is correct, then the takeaway is that any increasing oil supply from Saudi Arabia won't be coming on May 2 when the Iran waivers end but not until after June 30

On Wed, Saudi pointed to an increase in oil supply post June 30

Later in the memo we remind that OECD oil demand always seasonally increases in Q3 and this provides the market fundamental support (and need) for more oil supply. One of the reasons why we were surprised by the market reaction on Fri to the Trump tweet was Saudi Energy Minister al Falih was well reported on Wed as indicating there was no need for any immediate (ie. to meet more Iran oil exports taken off the market after May 2) increase in oil supply. Reuters wrote [LINK] "*Saudi Arabia's energy minister said on Wednesday he saw no need to raise oil output immediately after the United States ends waivers granted to buyers of Iranian crude, but added that his country will respond to customers' needs if asked for more oil. Speaking in Riyadh, Khalid al-Falih said he was guided by oil market fundamentals, not prices, and global oil inventories continued to rise. "Our intent is to remain within our voluntary (OPEC) production limit, but (we will).. be responsive to our customers,*

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especially those who have been under waivers and those whose waivers have been withdrawn," Falih told reporters.". And "*"We will be responsive and we think there will be an uptick in real demand but certainly we are not going to be preemptive and increase production," Falih said."* Our Supplemental Documents package includes the Reuters story.

Oil – Did Iran soften its Strait of Hormuz position? Opening door to negotiations?

Saudi oil demand is +500,000 b/d in summer

Perhaps the key question from our Apr 24 blog "*Iran Sanctions – What Are Key Potential Risks To Oil By The US Putting Iran's Back To The Wall?"* [LINK] was if Iran was softening its stance on the Strait of Hormuz. There is no question that the consensus view on Iran is that they are threatening closure of the Strait of Hormuz if they can't export their crude. There is no question that those words are being spoke by Iran. But what caught our attention was a subtle change of Iran's position on the Strait of Hormuz and one that is being delivered by the military, who typically give the most hawkish comments. Our Apr 24 blog asked "*Did Iran throw out a feeler and soften its stance on the Strait of Hormuz or did Tangsiri make a rookie mistake?*" There was a Mehr (Iran news) story [LINK] noting that Rear Admiral Tangsiri just took over in this role. Mehr quoted him "*if Iran's benefits in the Strait of Hormuz, which according to international rules is an international waterway, are denied, we will close it*." the market focused on his statement was his threat on other countries tanker traffic, but we were surprised by his comment that the Strait of Hormuz is an international waterway and not the standard Iranian line of being in Iranian waters. We don't recall ever hearing this position. To date, Iran has maintained that it has control of the Strait of Hormuz. We wonder if Iran is throwing out a feeler that they will soften their stance on claims to the Strait of Hormuz or did Tangsiri make a rookie mistake in his comments to Mehr. Perhaps the biggest reason why this caught our attention is that the military typically comes out with the most hawkish comments and not softening of a position as critical as on the Strait of Hormuz. Our Supplemental Documents package includes the Mehr story.

Iran's claim to the control on the Strait of Hormuz

To date, Iran has had a strong view and belief for its control of the Strait of Hormuz was from its view that it owns three key strategically located islands - Abu Mousa, Greater and Leser Tunbs. The US and others do not recognize the Iran ownership claim and therefore believe that Iran does not have any right to impact oil and LNG flow thru the Strait of Hormuz. Whereas Iran has physical control and also claims territorial control. These islands are strategically located at the west (north) side of the Strait of Hormuz and in theory provide support to Iran's territorial rights over part of the Strait of Horumz. There is a long standing dispute on the islands since the Nov 1971 Memorandum of Understanding signed between Iran and Great Britain. The MOU was signed by Great Britain since the UAE was not formally founded as a country until Dec 1971. UAE has claimed the islands as theirs from the start. The US and UK and others didn't make this an issue in the 70's because of their support for the Shah of Iran. But post the 1979 Iranian revolution, UAE has had strong support for their position. However, the UAE has not yet been successful in getting its claim to international courts (as opposed to the Philippines success in the South China Sea against China, unfortunately which hasn't meant much). The significance of these islands is water depth for super tankers. The below map [LINK] shows Abu Mousa, Greater and Lesser Tunbs and the water depths in the Strait of Hormuz.

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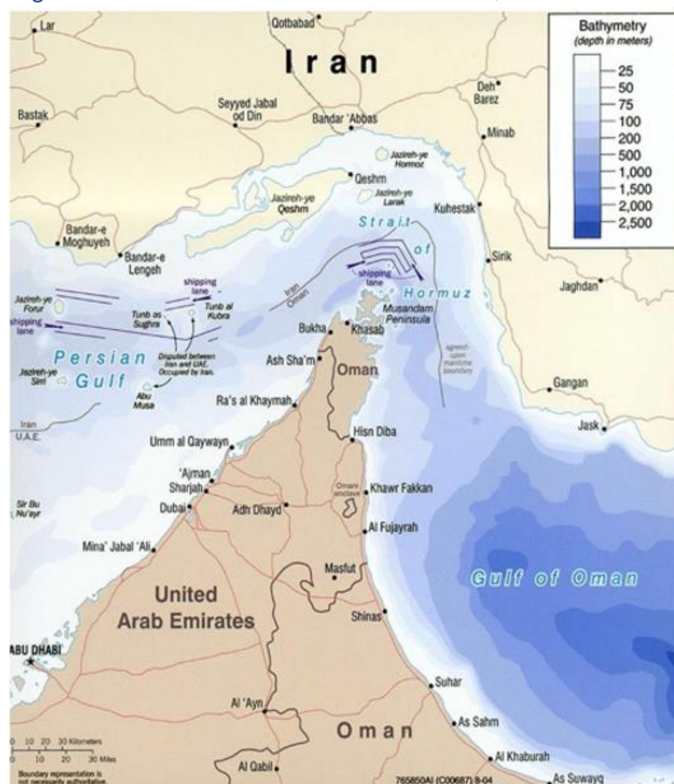
Figure 16: Strait of Hormuz – Abu Mousa, Greater and Lesser Tunbs



Source: Project/2000

Oil – Putin says no OPEC+ changes until at least July 1

Putin says no OPEC+ changes until at least July 1

Early yesterday morning, we tweeted [LINK] on Putin's Sat comments in Beijing "*Putin's comments in Beijing don't take away likelihood OPEC+ increase oil supply effective July 1. But he is trying to reinforce that OPEC+ is not going to do anything on May 2, when US Iran waivers expire and Trump tries to get Iran's exports to zero.*" Putin's comments seemed pretty clear on one side – no changes to OPEC+ deal for when Iran waivers expire on May 2 and no changes until at least July 1 ie. OPEC+ cuts deal has a term ending June 30. He didn't speculate what, if anything, would happen after June 30 and he did not shoot down the likelihood (in our view) for OPEC+ to put more oil supply on the market. The Bloomberg story "*Putin Says Countries in OPEC+ Deal Are Abiding by Agreement*" [LINK] included "R*ussia will not immediately raise oil output after the United States ends sanctions waivers for buyers of Iranian crude in May, President Vladimir Putin said Saturday." ""We have an agreement with OPEC to maintain production at a certain level and this agreement is in force until July," Putin told reporters on the sidelines of a summit in Beijing. "I can't imagine how the world energy market will react"after the waivers end in May, Putin said. But, he added, "none of our partners, including Saudi Arabia, is withdrawing from our agreements within OPEC." Saudi Arabia, the world's top crude exporter, has also said it had no immediate plans to raise oil output after the sanctions waivers end."*

Oil – Saudi Arabia uses ~500,000 b/d more each summer for power generation

Saudi oil demand is +500,000 b/d in summer

It was well reported this week that the US, UAE said Saudi Arabia would step in to ensure a well supplied oil market in response to the US not renewing Iran waivers. We agree that

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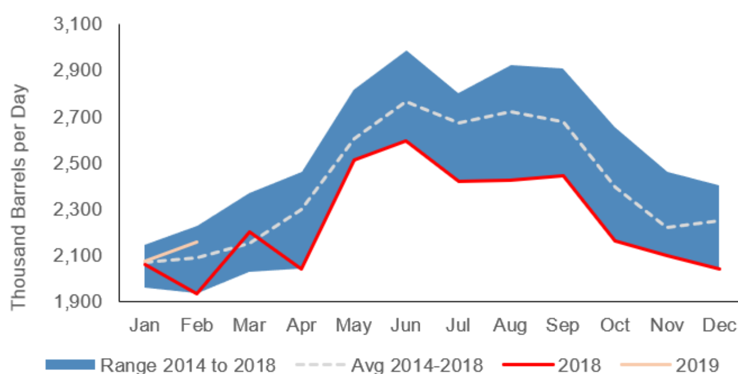
Saudi Arabia can easily increase oil production back to Oct 2018 reference levels, but we don't agree that this will lead in a barrel per barrel increase in Saudi Arabia oil exports. Increased exports from Saudi Arabia to balance oil markets sounds good, but, in reality, Saudi Arabia's ability to drastically increase exports only really works outside of the summer months. This is the hottest time of the year and Saudi Arabia relies on oil for added power generation which is why we Tweeted on Tues [LINK] *"Saudi increasing oil production in summer doesn't result in bbl for bbl increase in oil exports. Oil for electricity peaks in summer, 70% of electricity is air conditioners. JODI data shows Saudi domestic demand is ~500,000 b/d higher in summer."* Saudi Arabia just doesn't have the same flexibility to increase exports in May thru Oct, which is often overlooked but is not a recent phenomenon and has been documented in the Energy Tidbits memo for a decade or more. Below is a graph of seasonal oil demand in Saudi Arabia, using JODI data which can be found at [LINK].

Figure 17: Saudi Arabia Total Oil Products Demand



Source: JODI Data

Oil – OECD oil demand is always seasonally highest in Q3

OECD Q3 oil demand +0.8 mmb/d QoQ

The other normal major challenge in reducing Iran oil exports is that, every year, OECD oil demand is seasonally higher in Q3 vs Q2. On Tues, we tweeted [LINK] "*OECD oil demand is seasonally highest in Q3. Last year, OECD Q3/18 oil demand was +0.9 mmb/d QoQ vs Q2/18, and this year, the IEA Oil Market Report Apr 2019 forecasts OECD Q3/19 oil demand +0.8 mmb/d QoQ vs Q2/19. See SAF blog*." Below is a table showing the IEA's oi demand forecast from its IEA Oil Market Report April 2019 [LINK].

Figure 18: IEA World Oil Demand Forecast, Oil Market Report April 2019

IEA World Oil Demand Forecast										
(mmb/d)	Q1/18	Q2/18	Q3/18	Q4/18	2018	Q1/19	Q2/19	Q3/19	Q4/19	2019
Total Demand	98.5	98.8	99.9	99.6	99.2	99.5	100.4	101.2	101.2	100.6
Total OECD	47.9	47.2	48.1	47.8	47.7	47.7	47.6	48.4	48.2	48
Americas	25.3	25.4	25.8	25.7	25.5	25.4	25.8	26.1	25.9	25.8
Europe	14.1	14.2	14.7	14.1	14.3	13.9	14.4	14.7	14.3	14.3
Asia Oceania	8.5	7.6	7.6	8	7.9	8.3	7.5	7.5	8	7.8
Non-OECD Countries	50.6	51.6	51.8	51.8	51.5	51.8	52.8	52.9	52.9	52.6
FSU	4.5	4.6	4.9	4.8	4.7	4.6	4.7	5	5	4.8
Europe	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
China	12.7	13.0	13.2	13.1	13	13.1	13.4	13.6	13.7	13.5
Other Asia	13.8	14.1	13.5	14	13.9	14.3	14.4	13.9	14.4	14.3
Americas	6.3	6.4	6.5	6.4	6.4	6.3	6.4	6.4	6.4	6.4
Middle East	8.2	8.5	8.8	8.2	8.4	8.2	8.6	8.8	8.2	8.5
Africa	4.3	4.3	4.2	4.4	4.3	4.5	4.4	4.3	4.4	4.4
Source: IEA										

Source: IEA

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Oil – Heightened watch on terrorism as month long Ramadan starts on May 5

Every year, there is a heighted alert for terrorism during Ramadan, which starts May 5 evening, and ends June 4 evening. In prior years, our Energy Tidbits memos have noted the prior the US Overseas Security Advisory Council warning, referring to Ramadan, that "martyrdom during the month may hold a special allure to some". It is described by the Islamic Foundation of Toronto [LINK] *"Ramadan is the ninth month of the Islamic calendar and the month of fasting for Muslims. Fasting is one of the five pillars of Islam; the others are confession of faith, five daily prayers, Zakah (almsgiving) and Hajj (pilgrimage to Makkah)", and "Fasting in Ramadan is a main pillar of Islam that helps Muslim grow closer to the One God, Allah. According to the Qur'an "Fasting is prescribed for you as it was prescribed to those before you, so that you may learn self-restraint".*

Monthly long Ramadan starts May 5

Oil – Looks like 2 weeks to fix Druzhba 1 mmb/d pipeline quality issue to Europe

One of the big oil news stories this week was Russia had to halt ~1 mmb/d of oil being pipelined to Europe via the massive Druzhba oil pipeline due to quality issues. Bloomberg terminal reported "*Russian oil flows were halted across Europe after customers complained of unusual impurities in the crude, adding another disruption to the global oil market and briefly pushing prices in London above $75 a barrel. Poland, which receives oil through a northern section of the giant Druzhba pipeline, stopped Russian imports, saying shipments have become contaminated by organic chlorides. The halted section passes from Poland to Germany. Ukraine similarly halted barrels flowing through the southern link of the pipeline.*" Druzhba is a major oil pipeline with approx. 1 mmb/d throughput via north and south legs. The north leg is approx.600,000 b/d to Poland and Germany, the south leg is approx. 400,000 b/d to Slovakia and the Czech republic. There is also a leg that splits off to the north to the Baltic. The pipeline moves Urals crude API 31.78 and H2S 1.35%. By Friday night, it was reported that the problem and location was identified, a solution determined and could be implemented in two weeks. Bloomberg terminal report "*Talks in Minsk on Friday between officials from countries along the crucial oil conduit agreed on a technical solution that's now under review, Poland's pipeline operator said. Separately, Russia's pipeline operator Transneft PJSC said it had identified the source of the contamination, blaming a private storage terminal in the center of the country for feeding chlorides into the pipeline. Pumping through the southern section of the Druzhba pipeline into central and eastern Europe was halted overnight, Ukraine said. That brought the link to a complete stop since the larger northern branch of the link through Belarus into Poland and Germany had already shut down. Europe will be deprived of least 1 million barrels a day of crude flows for the duration of the outage.*"

~1 mmb/d less Russia oil export to Europe

Oil – India's crude production falls 6.2% YoY in March

India is key to growing global oil demand, but is not a major oil producing country, but we follow India and other similar sized producing countries to get some color on the rest of world oil production. India's crude oil production has been declining for several years, and it looks like the decline is continuing in 2019. On Wednesday, India's oil ministry published its Monthly Production Report for Mar 2019. Mar crude oil production was down 44,926 b/d to 673,887 b/d, from 718,813 b/d in Mar 2018, putting Mar crude oil production 13.0% lower than India's self-imposed oil production target of ~775,000 b/d. Meanwhile natural gas production was marginally higher, with a 1.2% (+0.05 bcf/d) YoY increase in Mar. India is heavily reliant on oil imports to meet local demand which means supply interruptions from Iran and Venezuela, along with decreasing local oil production puts the country in a difficult situation of sourcing imports from different countries. Below is graph from India's oil ministry illustrating the lower YoY oil production

India oil production falls 6.2% YoY in Mar

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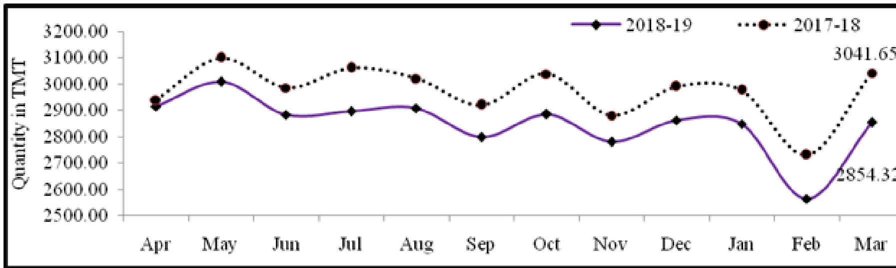
Figure19: India's Monthly Crude Oil Production



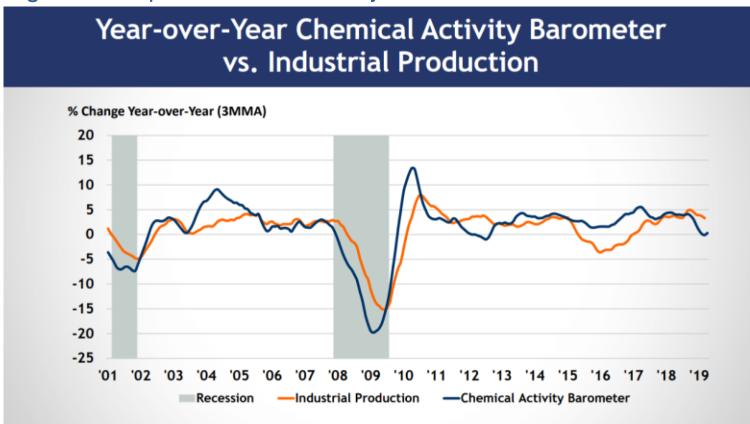
Source: India Oil Ministry

Oil – ACC Chemical Activity Barometer shows another monthly economic gain

Chemical Activity Barometer shows second monthly gain

One of the themes in March was stronger economic growth than expected and not just in the US and in China. It may not be as big growth in 2019, but the US continues on path for another solid year of growth. On Tuesday the American Chemistry Council released the April *"Chemical Activity Barometer"* (CAB) [LINK]. The CAB has a good track record as a leading indicator of a recession in the US economy with an average lead time of 8 months as a prior indicator, but lead time ranging from 2 to 14 months. The Apr CAB is slightly more positive than Mar, indicating gains in US commercial and industrial activity thru mid 2019, albeit at a slow pace. The Apr CAB said the CAB "*rose 0.5 percent in April on a three-month moving average (3MMA) basis, the second monthly gain after several weak months. The unadjusted measure of the CAB rose 0.8 percent in April and 0.7 percent in March. The diffusion index was steady at 65 percent in April, an improvement over the winter months".* The Apr CAB "*The latest CAB signals gains in U.S. commercial and industrial activity through mid-2019, but at a slow pace," said Kevin Swift, chief economist at ACC. "As a result, the recovery and expansion underway is likely to surpass the record of 120 months set during the 1990s. The CAB reading suggests that there are glimmers of hope for improving activity in the closing months of the year*." Below is a chart of the YoY CAB vs industrial production.

Figure 20: Apr Chemical Activity Barometer vs Industrial Production



Source: American Chemistry Council

Oil and Natural Gas – sector/play/market insights from Q1 calls

Sector insights from Q1 calls

We are now in our favorite time each time of each quarter as it is quarterly reporting and this is when we get the best insights into a range of oil and gas themes/trends, sectors and plays.

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As a reminder, our Energy Tidbits memo does not get into the quarterly results, forecasts or valuation. Rather the purpose of highlighting a company is to note themes/trends and plays that will help shape a reader's investment thesis to the energy sector. In the conference calls, we also tend to find the best insights from the Q&A portion as opposed to the prepared remarks. Plus we tend to get the best E&P sector insights from services, pipelines, refineries and utilities and that was the case again this week.

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Halliburton – Need more capex for completion equipment

Halliburton held its Q1 call on Wed. (i) Earlier in the memo we noted HA's comments that make us wonder about how quickly the move to tier 2 acreage is happening and if this will impact US shale oil growth post 2020. (ii) Is HAL pointing to US oil growth, or at least the growth contribution from smaller operators, at risk of being a little less than expected? We think the inference is that smaller operators need to increase their rig counts and likely completions to hit their production targets. (iii) Linked to the above point, also wonder if smaller operators are going to be at risk of having lesser completion equipment? If so, it means that there will be higher costs and, in theory, a higher risk to their expected per well results. HAL highlighted that there hasn't been enough service sector capex to maintain and upgrade the completion equipment. And that using local Permian sand adds more wear and tear as the sand is finer and more abrasive. Mgmt highlighted "*Industry sources estimate that about 7.5 million hydraulic horsepower will need to be rebuilt in 2019 to maintain a flat horsepower supply*." (iv) Seeing a pickup in customer activity in North America and have visibility for the next couple quarters based on how their calendar of equipment. (v) Interesting point about using Permian local frack sand. "*The shift to local sand that is finer and more abrasive also leads to more equipment wear."* (vi) Notwithstanding the visibility in their calendar, they still see lower YoY North American capex. Mgmt said "*On the demand side, it's evolving as we had anticipated. Our customers have announced their 2019 budgets and we expect that overall spend will be down 6% to 10% in North America*". (vii) Much more bullish on International activity. Mgmt recapped all the areas around the world are increasing activity. In the Q&A, they described why they are more bullish on international today "*Yes, thanks. Look, I think what gives me more confidence is how broad-based this recovery looks today. And so we start to see not just a greenshoot here or there, but I think as I described in my commentary, nearly every region I talked about in terms of some form of growth. We also see a broadening base of offshore activity, not maybe activity and also the tendering activity that leads to more activity as we go into 2020*." Our Supplemental Documents package includes excerpts from the Halliburton Q1 call transcript.

Helmerich & Payne – Industry activity should bottom Apr-June

Helmerich & Payne held its Q1 call on Thurs. (i) HP has a Sept 30 fiscal yr end. (ii) Also see a bottom in industry rig activity in Apr-June period. (iii) Not seeing industry respond to higher oil prices. Mgmt said "*The oil price for WTI is up over 40% since the beginning of the calendar year. In past cycles, this kind of price action would bring on higher activity.Yet today, we are seeing a more tempered response and even reductions in activity by some in the industry. Clearly, customer behavior is changing and the movement is towards prioritization of cash flows and less focus on the Group*." (iv) No change to view of lower industry drilling activity in 2019., but the higher oil prices are pointing to less of a decline than expected six months ago. They called for reduction in horizontal rigs, noted above down again in the Apr-June period, but bottoming, and then flat for their H2/F2019. But they say if oil prices stay

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up, then could see more than flat in their H2/F2019. (v) They are a little different than others as their international revenues are lower going forward, whereas others seem to have already bottomed. It looks like it is only because of Colombia being lower revenues. In the Q&A, they noted they expected Colombia activity to contract a bit this year, but then inferred they will be increasing this Colombia activity view with higher oil prices. In the Q&A, mgmt. replied "*In the call in January, we had provided some guidance that we expected the Colombia market to contract a bit, we really see that market more directly correlating to oil price movements for this quarter. Upcoming that we're giving guidance for it, we do not see any any revisions back even with the oil price trajectory that we've seen recently, but stay tuned.*". (vi) We believe the Vaca Muerta shale reached an inflection point in 2018 and is just starting to accelerate. Its still early in the acceleration phase, but we believe the Vaca Muerta reached the inflection point in 2018. Helmerich does not say so specifically, but the key indicator is that they indicated they are sending their first international super spec rig to Argentina. The super spec are their top of the line rigs that are used in the Permian. This is positive indicator to the Vaca Muerta. (vii) Unconventional activity to pick up in Arabian peninsula. We believe this will be one of the industry themes for the 2020s, increasing unconventional drilling in the major Middle East areas in particular Saudi Arabia. One of our concerns in these areas is lack of water, but this is where the developments that on fracking without water will be key. We highlighted this in our July 13, 2017 blog "*Can Saudi Arabia Make SmartWater Flooding, Solar, And Fracking Work?*" [LINK] Mgmt said "*we've had tremendous success in Argentina that mirrors the success we've had in the US land we certainly aim to be a part of that continuing story there and next, we really look for unconventional to move to the Arabian Peninsula, so several different countries in the Middle East and I think in the January call we even mentioned that some of the inbound inquiries we've had there".* Our Supplemental Documents package includes excerpts from the Helmerich & Payne Q1 call transcript.

National Oilwell – Potential drill pipe shortage could delay ramp up in drillilng

National Oilwell Varco held its Q1 call on Fri. (i) Probably the best warnings on specific items that could cause delays and fit to the theme that the rate of activity growth will likely be a little slower than expected. (ii) Specific warning that lack of drill pipe may slow down drilling. Mgmt said "*Third, drill pipe demand is shifting from land to offshore. Despite land customer inventory levels within our drill pipe yard at 10-year lows, North American drillers pushed deliveries of drill pipe into the second quarter or later. This drove a sharp sequential falloff in revenue for our Grant Prideco business, which accounted for more than half of the total top-line sequential decline for the Wellbore Technologies segment. This is not sustainable. Land drillers are demonstrating strict capital discipline, but they are consuming drill pipe daily and they won't be able to drill when they run out*" (iii) Warns on level of capex being put into maintenance of equipment. This is consistent with some of the other service company calls and it reminds that equipment capacity will be a little less than expected, which is a factor for the rate of expected activity and ramp up. will be a little less than expected. Points to a little slower than expected ramp up and the likely producers who get a little delayed or short equipment will inevitably be the smaller producers. In the Q&A mgmt. replied "*But really what you're raising is a really good point related to how sustainable is their ability to sort of postpone the inevitable, which is really taking care of a large equipment fleet that gets used day in and day out, out in the field. And our service customers can certainly slam on the brakes and screech just about everything to a halt for a period of time, but to some*

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extent, you're delaying the inevitable, right?" "You have to continue to take care of the equipment. If North America oil and gas operators want to continue to see efficiency improvements in operations day-to-day, whether that's fewer days to drill, more stage count each and every day, customers have to take care of their equipment. I don't want to imply to you that our customers are not taking care of their equipment and setting themselves up for issues, but what I am implying is that you can delay things for a limited period of time before that catches up to you." (iv) Perhaps the best description of how service companies responded when oil prices went down in Dec. Mgmt said "*Oilfield service companies are skilled at slashing spending during market slowdowns and our phones went quiet in December and January."* (v) Like others, they are seeing the recovery later in the year ie. inferring H2. In their prepared comments, mgmt. said "*So overall, while the first quarter was very disappointing and our outlook remains less certain than we'd like, we see emerging pockets of demand and signs of recovery that provide a more constructive backdrop for the potential recovery later in the year*." (vi). Sales to pressure pumpers down 58% QoQ. (vii) Another to note how international is growing. Mgmt said "*While we're seeing land drill pipe demand slow, international and offshore markets are moving the other way, coming back to the table after years of subsisting off excess drill pipe from their stacked fleets. This quarter, offshore sales increased 15% to push its mix to 39% of the total*". Our Supplemental Documents package includes excerpts from the National Oilwell Q1 call transcript.

Patterson UTI – Expect industry activity to bottom in Q2

Patterson UTI held its Q1 call on Thurs. (i) Similar sector insights as the other service companies. (ii) .Another service company saying higher oil prices have not yet translated into higher rig demand. Mgmt said "*Turning now to our Contract Drilling outlook, higher oil prices have not yet translated to higher rig demand, which remain subdued, as customers have been delaying plans to pick up incremental high-spec rigs. While it's fully recognized that it is counterintuitive with WTI in the mid-60s, In the near-term, we expect our rig count will decline further, bottoming this quarter in the mid-150s*." (iii) They expect privates to respond quicker to publics with increasing rigs. They were questioned on this a couple of times and asked if this was because of inbound calls. They didn't say it was from inbounds. Rather it was more that privates react quicker on both up and down oil prices,. The privates cut budgets quicker when the prices fell at year end, and so they think they will increase quicker now that prices are stronger. (iv) Expect activity to bottom in Q2 ie. still go lower. (v) They aren't expecting the higher oil prices to result in increased YoY drilling and completion activity, rather just less severe of a decrease. Mgmt said "*Thanks, Andy. Last quarter, I commented that the fourth quarter decrease in oil prices was surprising in terms of both the magnitude and the speed of the decline. In the first quarter, the speed and magnitude of the recovery in oil prices has been almost as surprising. It now appears that the decrease in drilling and completion activity will be much less severe than some have forecast in late 2018*". Our Supplemental Documents package includes excerpts from the Patterson UTI Q1 call transcript.

Electricity – Is energy storage getting ready to take off?

Wood Mac sees big energy storage growth

Long term readers know that one of our mid to long term oil concerns had been that, by Jan 1, 2019, we expected that the breakthrough would be there for battery storage of electricity to be cheap enough (good economics) and available enough such that there would be visibility for a predictive timeline in the 2020s of a major adoption reliance on renewable energy to start a more significant displacement of oil and natural gas for electricity. We have previously

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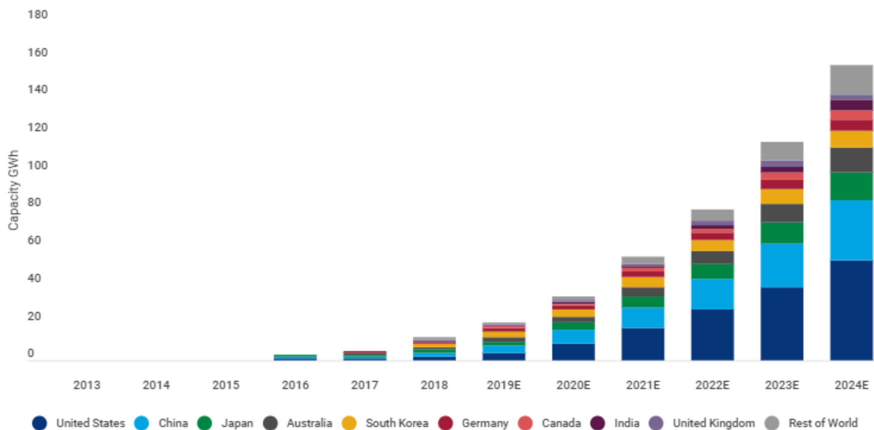
wrote [LINK] why we care about storage "*In Jan 2014, a Shell engineer involved in their future energy technologies initiative asked me "what do you think happens to the value of oil if Saudi Arabia were to stop using 400,000 b/d of oil for electricity after 2025?" He elaborated and said it wouldn't all happen by 2025 but that it would take until 2030. He explained there was two parts to the solution of how to accomplish this goal. First, solar and battery technology in general had to get to the point that it can compete without subsidies and be reliable enough to provide base generation. Second, Saudi Arabia, despite being sunny, still had to solve its own unique challenges for solar and battery ie. sand/dust. He then shared his view that in 3 to 5 years (ie by Jan 2019), there would be visibility that solar and battery can be an economic, available, reliable alternative for electricity generation post 2025."* We still don't believe there has been that breakthrough to visibility to scalable and cost effective storage technology, at least as of yet. That was the theme of our Jan 2, 2019 blob [LINK] *"Lasting Change To Oil & Gas #4 – Bill Gates "Unlikely To Have Super-Cheap Batteries Anytime Soon" To Store Sufficient Energy".* Lets be clear, we do believe there will be a technology breakthrough, but we haven't see it yet. This week, Wood Mackenzie provided a positive view of storage and their view of huge (relative to the existing base) growth expected in global storage thru 2024 [LINK]. According to the report, cost reductions, along with interest from policymakers and regulators should ramp up growth in storage, and the report says "*Last year saw global energy storage expand to record levels, with 147% year-on-year growth in gigawatt-hour (GWh) terms. This pales in comparison to what is to come. By 2024, we forecast that the market will expand 13-fold".* In GWh terms, storage capacity is forecast to grow to 158 GWh in 2024, from the current 12 GWh. 2018 growth in the energy storage market was mainly driven by the non-residential sector, particularly in South Korea, and not surprisingly, the residential sector showed the smallest growth, likely due to high upfront costs, and decades long payback periods for residential renewables installations. Below we pasted a graph from the Wood Mac, which illustrates the forecast storage capacity growth by country.

Figure 21: Global Cumulative Battery Deployment Capacity, 2013-2024



Wood Mackenzie

Demographics – Americans 20% more likely to be stressed than rest of world

Americans more stressed than the global average

We were a little surprised by the results of the Gallup poll [LINK], which found 55% of Americans in 2018 had felt stress a lot during the previous day. Interestingly, the US scores very high on stress levels compared to the global average, the Gallup report said "*In fact, the 55% of Americans who experienced stress was one of the highest rates out of the 143*

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countries studied and it beat the global average (35%) by a full 20 percentage points". Our being surprised is because of the disconnect between a strong US economy, and negative American stress levels. American stress levels were actually higher in 2018 than during the US recession years.

Energy Tidbits – Now on Twitter

Energy Tidbits now on Twitter

As you have probably noticed in today's memo, we are tweeting now for breaking news or early views on energy items, most of which are followed up in detail in the Energy Tidbits memo or in separate blogs. We have now been tweeting for a few weeks, our Twitter handle is @Energy_Tidbits and can be followed at [LINK]. We wanted to use Energy Tidbits in our name since I have been writing Energy Tidbits memos for over 19 consecutive years. Please take a look thru our tweets and you can see we aren't just retweeting others tweets. Rather we are trying to use Twitter for early views on energy items. Our Supplemental Documents package includes our tweets this week.

Energy Tidbits – Sign up on our email distribution for tidbits and blogs

Sign up to receive future Energy Tidbits memos

Please note that we have set up our Energy Tidbits memo on our Stream Asset Financial website alongside our blogs. The distribution for the Energy Tidbits memo will be via the same notification system used for our blogs. To ensure you receive Energy Tidbits memos, please go to our blog sign up. We will be using the blog notification list for Energy Tidbits. The blog sign up is available at [LINK].

LinkedIn – Look for quick energy items from me on LinkedIn

Look for energy items on LinkedIn

I can also be reached on Linkedin and plan to use it as another forum to pass on energy items in addition to our weekly Energy Tidbits memo and our blogs that are posted on the SAF Energy website [LINK].

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