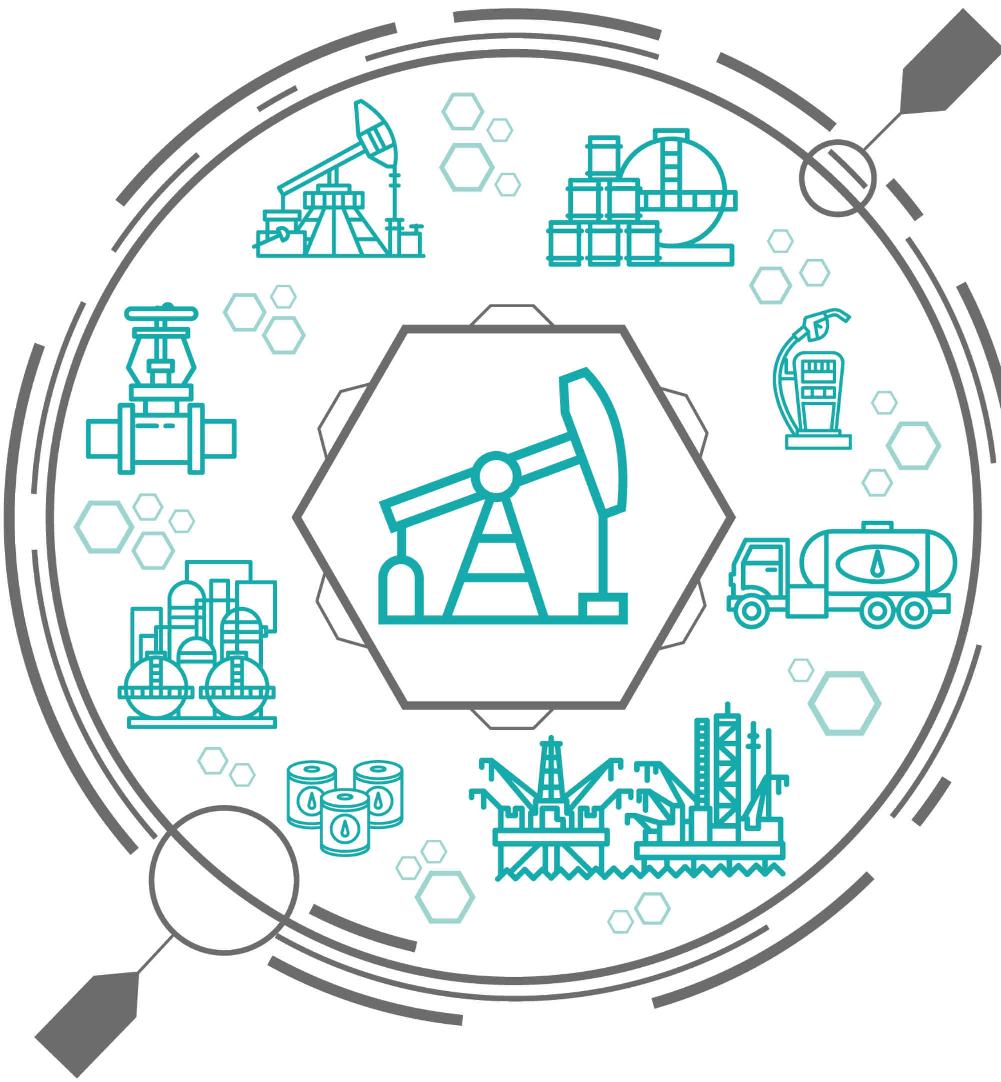
Deloitte.



Price forecast

December 31, 2018

Resource Evaluation & Advisory

Forecast commentary

"I can't change the direction of the wind, but I can adjust my sails to always reach my destination."

— Jimmy Dean

Volatility continues to be the theme of the oil and gas sector, with prices fluctuating substantially throughout 2018. International prices started to soften in October as the industry expressed concern about increased supply and minimal demand growth. WTI prices fell as domestic production volumes reached record levels and transport issues persisted, primarily in the Permian basin. Overseas, Brent crude pricing continued to outpace North American pricing, averaging approximately US$9/bbl higher than WTI prices in the last quarter of 2018. Brent prices decreased substantially in November, however, as a result of increased international supply and exemptions from Iran sanctions granted to several countries, including India and China.

In December, OPEC and non-OPEC countries agreed to decrease production output by 1.2 MMbbl/d. If member nations meet these production-cut quotas, global inventory volumes should decrease and Brent prices should increase. That said, persistent supply growth in the United States means WTI prices are expected to remain at a larger-than-historical discount to Brent until additional transportation and export infrastructure comes online.

Canada experienced a severe imbalance between production and export capacity in the last quarter of 2018, causing Canadian oil price benchmarks to collapse. Heavy oil differentials widened to US$45/bbl in mid-November while light oil differentials reached highs of US$35/bbl. Storage stockpile volumes in Alberta rose to approximately 35 MMbbl due to increased production from oil sands projects and temporarily decreased demand due to refinery maintenance. Major disruptions to Canadian crude oil exports occurred in Q4 2018 because of lower-than-usual refinery utilization rates in the US Midwest, where almost 70 percent of Canadian crude exported to the United States is processed. Refinery utilization rates decreased to 73 percent at the end of October from traditional rates of over 90 percent, leaving Canadian crude oil with nowhere to go. As these refineries returned online in late 2018 and reached a more typical utilization rate, the price differentials began to narrow, but the Canadian supply glut remains an issue.

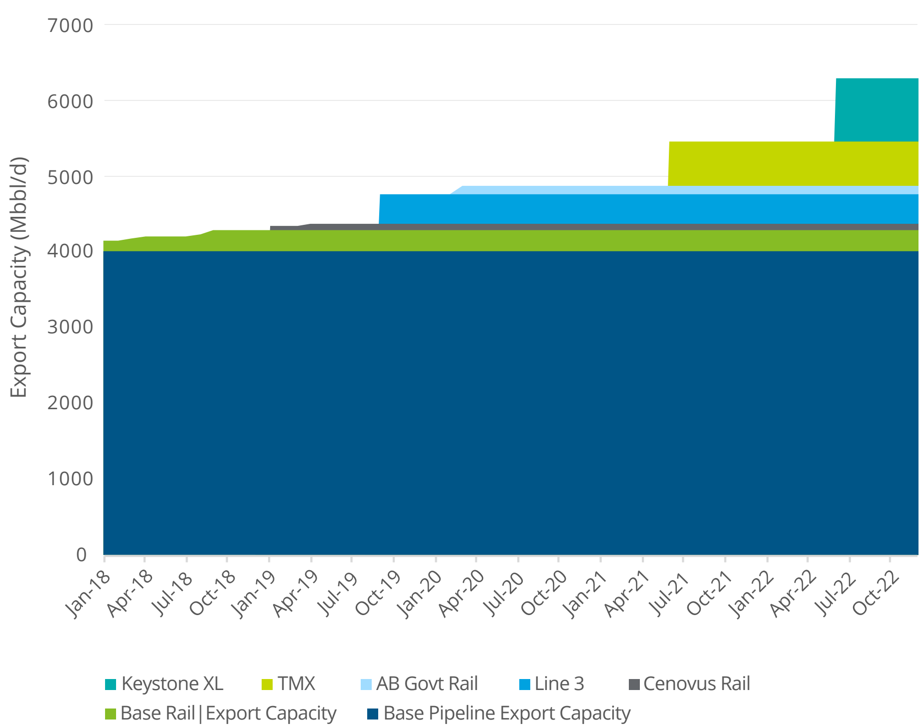
To reinstate the balance between oil supply and takeaway capacity with near-term effectiveness, the Alberta government is implementing mandatory production cuts that will take effect in January 2019. These curtailments are intended to reduce production by 325,000 bbl/d until excess storage volumes dissipate, which the government estimates will occur in Q1 2019. (Some operators have already announced company-imposed production decreases in Q4 2018, which will be included in the province-wide volume restrictions scheduled for 2019). Once storage volumes reduce, production cuts will be amended to 95,000 bbl/d until December 31, 2019.

This announcement has been met with mixed reaction in the industry since only a small percentage of producers are expected to be significantly affected. Operations producing less than 10,000 bbl/d are exempt from production cuts, so it is the bigger players that will bear the brunt of the measure: namely, the five producers that account for approximately 85 percent of Alberta oil production. Meanwhile, smaller Albertan producers and producers in Saskatchewan, where there are no mandatory cuts, are expected to benefit from rising crude prices. The imposed production volume reductions are expected to decrease differentials for Canadian oil price benchmarks and increase provincial royalty revenue for Alberta. The cuts are also likely to reduce drilling activity for the winter season, as companies try to meet curtailment quotas.

With the production-cut announcement and Midwestern refineries back online, Canadian oil differentials for both light and heavy made major strides in early December, injecting some much-needed hope into the market. Other measures to stabilize export capacity demand and supply include the purchase of additional rail cars by the Alberta government, with the goal to increase rail export capacity by 120,000 bbl/d by 2020. The expected timing of the new takeaway volumes and the process by which the additional volumes will be designated to producers are not yet known. Nevertheless, with pipeline projects in limbo, the investment in mid-term export capacity is good news for the industry. While the proposed purchase may not buoy near-term prices, it is expected to improve options for Canadian oil producers and decrease differentials to WTI pricing.

In addition to extra rail capacity, relief on pipelines should also be coming in late 2019. Enbridge's Line 3–a mixed-service route that transports a variety of crude oil, including light and heavy, from Alberta to the United States–is expected to come back online in the second half of 2019, after the replacement of the existing pipeline route is completed. Line 3 will add approximately 370,000 bbl/d of export capacity, increasing current capacities by an estimated 9 percent. This is expected to play a key role in relieving the Western Canadian oversupply and boosting Canadian prices heading into late 2019.

Canadian Pipeline/Rail Export Capacity



Source: CAPP, NEB

On the downstream side of the industry, the Sturgeon refinery in Alberta was scheduled to begin processing 80,000 bbl/d of diluted bitumen by the end of 2018. If the refinery continues processing in Q1 2019 as planned, the need for additional heavy crude pipeline capacity and rail shipments should be alleviated since more crude can be processed domestically. In addition, US Gulf Coast refineries have received less heavy oil from Mexico and Venezuela as production volumes in those countries continue to decline; Canadian heavy crude is expected to increase its market share in 2019 and fill the discrepancy in feed volumes to the Gulf Coast. We expect Canadian oil prices in 2019 will see a differential to WTI subject to rail costs, with that differential narrowing in 2020 as pipeline capacity increases.

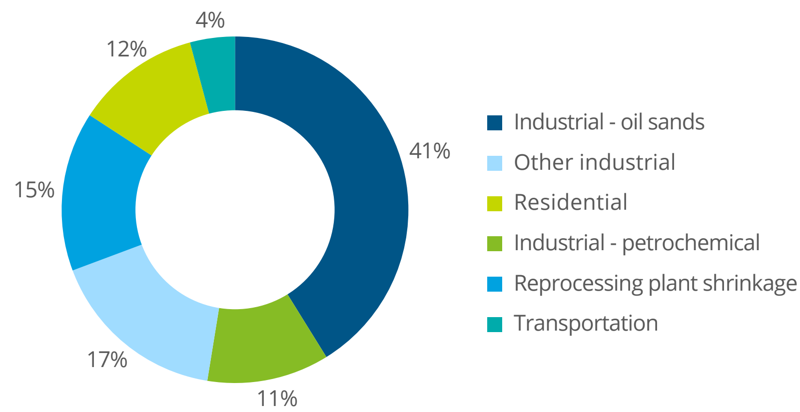
Natural gas prices in the United States have climbed since November, primarily due to low storage volumes and increased demand. Storage levels there are approximately 17 percent lower this year than the previous year, with large discrepancies in the south-central (Texas) and mountain areas (Colorado). Dry-gas production rates reached a record 86.3 Bcf/d in September 2018. In addition, domestic consumption of natural gas reached levels not seen since 2001, rising approximately 12 percent from 2017, while natural gas exports reached 10.1 Bcf/d in 2018, an increase of approximately 21 percent.

This increase in export volumes continues to be driven by liquefied natural gas. The United States exported 2.7 Bcf/d of LNG to 13 countries in 2018 and expect to export much more as multiple projects come onstream throughout 2019. By the end of the year, it is forecast that the country's LNG export capacity will reach 9.6 Bcf/d, almost tripling average 2018 volumes. We predict prices will slip from the current high early in 2019 as concerns over storage levels ease.

Canadian natural gas prices, meanwhile, have gained slightly in recent months but continue to trail behind the Henry Hub benchmark. AECO prices have fluctuated significantly, ranging from $3.20/GJ to $0.10/GJ throughout November alone, while natural gas production remained relatively flat in 2018. Producers have had good results, particularly in unconventional plays, from extended-reach horizontal drilling—a method that enables them to drill fewer wells (thus spending less capital) while still extracting significant volumes. Seen across the industry in 2018, this trend is expected to continue as gas prices stay low and companies strive to replace developed volumes with low-capital budgets.

Approximately 40 percent of Alberta natural gas consumption in 2017 was attributed to extraction efforts within the oil sands. Oil sands producers purchased 1.25 Bcf/d for in-situ production methods and a further 0.5 Bcf/d for mining and upgrading operations. As oil production cuts come into effect and large-scale oil sands projects scale back operations, short-term natural gas demand may slow in the province. Growth in condensate demand will likely shallow out as shipping bitumen by rail becomes more commonplace, since diluent isn't needed in rail cars as it is in pipelines.

Natural Gas Consumption - Alberta



Source: AER

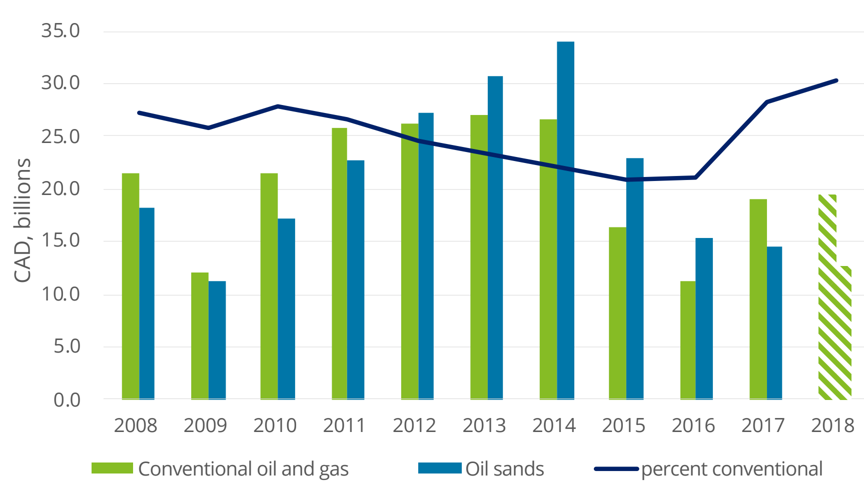
Canadian natural gas producers continue to take advantage of any price diversification opportunities that are available, with many producers shipping volumes to East Coast markets for better pricing. TransCanada recently secured gas transportation contracts on its mainline system to the North Bay junction, with end markets in Ontario, Quebec, the Maritimes, and the northeastern United States. The additional contract capacity benefits Western Canadian producers competing for market share and allows for price variation away from AECO benchmarks. This diversification has been necessary to give natural gas producers stability in an otherwise volatile period.

Summer maintenance on domestic pipeline systems over the last few years has caused AECO gas prices to plummet in the summer months during service disruptions. Although multiple maintenance projects have been completed, the number of infrastructure projects planned in Western Canadian for 2019 that may disrupt service and thus influence AECO pricing is unclear. Given the current environment, however, we expect the low AECO prices to continue for several years.

Alberta upstream oil and gas investment and royalties

Alberta has made numerous headlines recently because of its crude-by-rail investments and production restrictions, with most of the conversation focusing on oil sands companies. We thought it would be informative, therefore, to break down two aspects of the industry to see how the oil sands compare with less headline-making "conventional" projects, a catch-all term for all other production in Alberta. We focused on capital investment in the upstream oil and gas sector and the royalties paid on production by producing companies.

Alberta upstream oil and gas capital spending



Source: AER

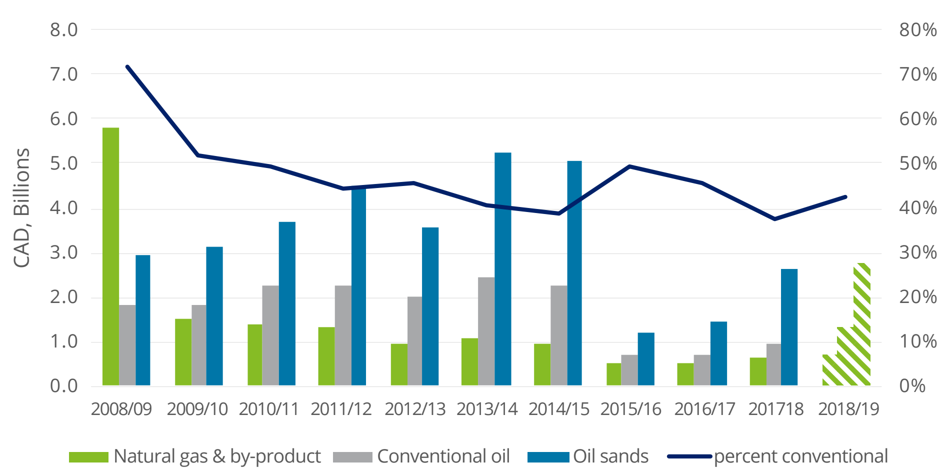
To set the context, Alberta's total oil and gas production was about 5 MMboe/d in 2018, including the oil sands, natural gas production, and other light and heavy oil production. Oil production alone was 3.3 MMbbl/d, with oil sands making up 85 percent of that total. Natural gas in the province averaged over 10 Bcf/d, which is 65 percent of total Canadian production. It makes sense the oil sands get so much attention in Alberta due to their high share of total production. Yet the "conventional" projects contribute to the province too—and they contribute significantly: the non-oil sands production on a barrel of oil equivalent basis makes up 46 percent of the total Alberta oil and gas supply. Conventional production includes Montney development, which leads natural gas production, as well as Duvernay, Spirit River in the deep basin, Cardium, and Viking.

Major companies are typically the investors for oil sands projects because of the large capital requirements and long lead times of these projects, while myriad junior and intermediate companies generally target the "conventional" plays. Many of these, however, require continual drilling to maintain the production base because the assets are high rate/high decline, and this need to drill results in a lot of capital spending and activity. In fact, capital spending on "conventional" projects is expected to make up 60 percent of total upstream capital spending in 2018.

This spending split is likely to be maintained because there are no large oil sands projects currently slated for construction, as was the case between 2012 and 2016, when the Fort Hills oil sands mine was under construction, for an estimated $17 billion. Alberta is unlikely to see that type of project come along again anytime soon.

Finally, a word about royalties. Oil sands projects contribute around 60 percent of the total oil and gas royalty revenue collected by the provincial government. This is substantial, but as they account for 85 percent of Alberta's oil production, the contribution might be expected to be more. So, while the oil sands get the most attention, conventional projects have been upholding more than their share of the capital investment in Alberta and paying more than their share of royalties to the province.

Alberta royalty revenue collected



Source: Government of Alberta

Canadian economic outlook

Craig Alexander, Deloitte Canada's chief economist

2019 is expected to be a year of economic transition, both internationally and in Canada. A key theme from the inaugural Deloitte economic forecast in October was that the North American economy is in the late stages of a business cycle. Since publication, economic and financial developments have only reinforced that view.

Global economic growth appears to have peaked in 2018. The base case forecast is for growth to moderate from close to 4 percent to 3.5 percent in 2019 and down to 3.2 percent in 2020. Emerging market economies will experience headwinds from financial market strains created by higher interest rates, a strong US dollar, and the impact of tariffs.

The pace of expansion in Japan and Europe also showed signs of cooling as we head into 2019. The US economy will continue to outperform its other advanced-economy peers in terms of the absolute pace of expansion, but it will experience the greatest degree of slowdown among them over the next two years. With unemployment at a five-decade low, part of the moderation will reflect a deceleration to a more sustainable rate of growth. However, US economic growth is likely to drop towards between 1.0 to 1.5 percent in 2020 as the impact of tax cuts dissipates and as fiscal policy becomes more restrictive. This will temper global economic growth but also weigh on North American supply chains.

One key development for the Canadian outlook has been the recent oil-price correction. Although crude oil prices will recover from their recent lows and the Alberta government's curtailment of oil production has shored up the price for Western Canada Select crude oil, there will be a reduction in oil production that will have a negative impact on national growth in 2019.

Given this backdrop, the Canadian economy is expected to slow from a 2-percent growth rate in 2018 to 1.6 percent in 2019 and then dip to 1.3 percent in 2020.

Storm clouds are gathering on the horizon in the form of key downside risks to the outlook. Further US protectionism and international retaliation could weaken global growth and lower commodity prices. A possible disorderly UK exit from the European Union could have detrimental economic and financial consequences. Financial market volatility may be heightened by a further rebalancing of monetary policy by some key central banks, particularly the US Federal Reserve and markets may become more worried about looming fiscal challenges in many emerging market and advanced economies, including the United States.

Hold the ship steady

While the downside risks have risen, Canadian businesses are advised to not overreact. The most likely scenario is that 2019 will be a year of more modest but still healthy economic growth. Although the Bank of Canada has signalled that it will ultimately raise the overnight rate to between 2.50 percent and 3.50 percent, we favour the bottom of that range due to a structurally slower trend of economic growth that reflects the impact of demographics from an aging population. Moreover, Bank of Canada Governor Stephen Poloz has frequently described the conduct of monetary policy as an exercise in risk management.

In other words, if the Canadian economy slows materially, interest rates will not rise as much as in the base case forecast. The dollar will also act as a shock absorber for the economy. Indeed, as economic prospects have diminished, the Canadian dollar has weakened. The exchange rate is expected to fluctuate between 73 and 76 US cents in 2019 and 2020, but it will depreciate below that range if the aforementioned negative risks are realized.

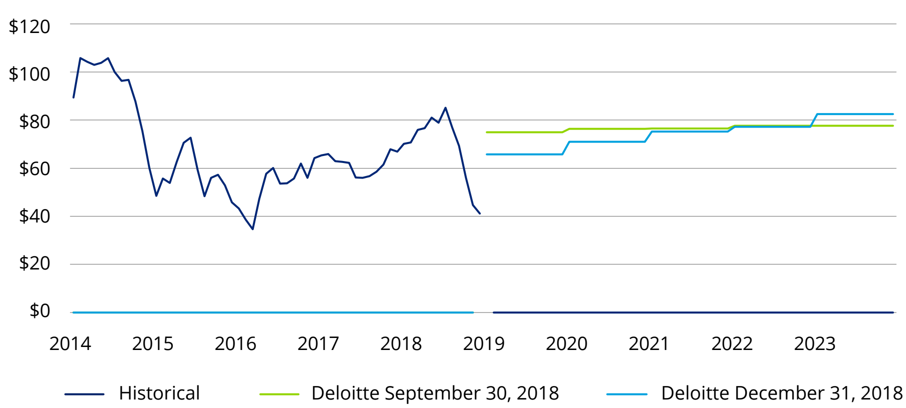
Financial market sentiment was negative in late 2018, with markets fixated on the risks of slowing global growth and a possible inversion of the US yield curve, which is a traditional recession signal. It is likely that financial market sentiment became too negative, so markets and commodity prices are likely to reverse some of their losses. However, it is important to be mindful that we are in the late stages of a business cycle and a greater economic slowdown appears to be in the cards in 2020. Specifically, with the US economic growth projected to drop towards a 1.0-to-1.5 percent pace that year, weaker US demand will dampen economic growth in Canada and feed through trade and financial linkages around the globe.

Despite the downside risks, organizations still need to be building for the future–making key investments, developing their talent, and growing their businesses. A more risky economic environment should not be allowed to paralyze or delay decision-making. At this stage, businesses should be bracing for slower economic growth but consider contingencies regarding how they will cope with the next business cycle when it finally materializes.

Canadian domestic price forecast

Crude oil price and market demand forecast

Edmonton par (real $)



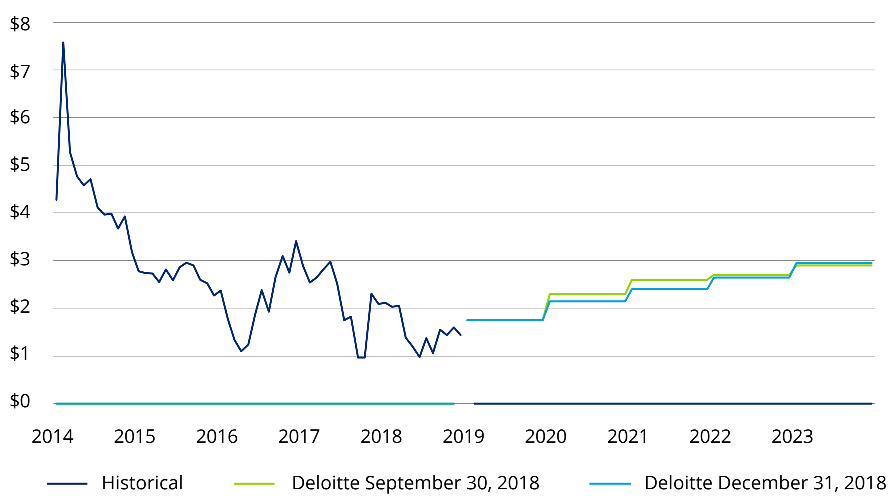
Forecast comments

- Edmonton Par is forecast as a differential to WTI. This differential is based on Canadian Light Sweet Oil Index Futures which began trading in January 2014.
- The Edmonton crude oil price is used as the basis for the remaining Canadian crude reference points. Offsets are based on five-year historical averages with recent years weighted more heavily in the determination.

Year	WTI Cushing, OK (40 API)	WTI Cushing, OK (40 API)	Edmonton City Gate (40 API)	Edmonton City Gate (40 API)	WCS Hardisty (20.5 API)	Heavy Oil Hardisty (12 API)	Cost Inflation	CAD to USD Exchange
	US$/bbl	US$/bbl	C$/bbl	C$/bbl	C$/bbl	C$/bbl		
	Real	Current	Real	Current	Current	Current	Rate	Rate
Historical								
2015	$50.77	$48.69	$59.44	$57.00	$44.80	$39.63	1.1%	0.783
2016	$44.50	$43.15	$53.84	$52.22	$38.90	$34.08	1.4%	0.755
2017	$51.71	$50.88	$62.89	$61.88	$50.53	$45.01	1.6%	0.771
2018								
12 Mths H	$65.20	$65.20	$68.89	$68.89	$52.24	$45.10	2.3%	0.773
0 Mths F	-	-	-	-	-	-	-	-
Avg.	$65.20	$65.20	$68.89	$68.89	$52.24	$45.10	-	0.773
Forecast								
2019	$58.00	$58.00	$65.80	$65.80	$50.00	$43.00	0.0%	0.760
2020	$60.00	$61.20	$71.05	$72.45	$57.75	$52.65	2.0%	0.760
2021	$62.00	$64.50	$75.30	$78.35	$60.80	$55.60	2.0%	0.770
2022	$65.00	$69.00	$77.20	$81.95	$64.45	$59.15	2.0%	0.790
2023	$70.00	$75.75	$82.50	$89.30	$71.70	$66.30	2.0%	0.800
2024	$70.00	$77.30	$82.50	$91.10	$73.15	$67.60	2.0%	0.800
2025	$70.00	$78.85	$82.50	$92.90	$74.60	$69.00	2.0%	0.800
2026	$70.00	$80.40	$82.50	$94.75	$76.10	$70.35	2.0%	0.800

Natural gas price and market demand forecast

AECO natural gas (real $)



Forecast comments

- The AECO natural gas price is forecast based on historical differentials to Henry Hub and future contracts traded on the NGX based in Calgary.

Year	AB Ref. Avg. Price	AB AECO Avg. Price	AB AECO Avg. Price	BC Direct Station 2 Sales	NYMEX Henry Hub	NYMEX Henry Hub
	C$/Mcf Current	C$/Mcf Real	C$/Mcf Current	C$/Mcf Current	US$/Mcf Real	US$/Mcf Current
Historical						
2015	$2.56	$2.81	$2.69	$1.81	$2.74	$2.63
2016	$1.93	$2.23	$2.16	$1.75	$2.59	$2.52
2017	$2.13	$2.23	$2.19	$1.56	$3.03	$2.99
2018						
12 Mths H	$1.24	$1.52	$1.52	$1.24	$3.20	$3.20
0 Mths F	-	-	-	-	-	-
Avg.	$1.24	$1.52	$1.52	$1.24	$3.20	$3.20
Forecast						
2019	$1.55	$1.75	$1.75	$1.45	$3.00	$3.00
2020	$2.00	$2.15	$2.20	$1.90	$3.10	$3.15
2021	$2.30	$2.40	$2.50	$2.20	$3.30	$3.45
2022	$2.60	$2.65	$2.80	$2.50	$3.40	$3.60
2023	$3.00	$2.95	$3.20	$2.85	$3.55	$3.85
2024	$3.30	$3.20	$3.55	$3.20	$3.75	$4.15
2025	$3.60	$3.40	$3.85	$3.50	$3.90	$4.40
2026	$3.75	$3.45	$3.95	$3.60	$3.95	$4.55

International price forecast

Crude oil price and market demand forecast

Year	Av. WTI Spot	Brent Spot (38.3 API with 0.37% sulphur content)	Gulf Coast ASC	Avg. OPEC Basket	Nigerian Bonny Light (33.4 API FOB)	Mexico Maya (21.8 API FOB)	Russia Urals (31.7 API FOB)
	US$/bbl	US$/bbl	US$/bbl	US$/bbl	US$/bbl	US$/bbl	US$/bbl
	Real	Real	Real	Real	Real	Real	Real
Forecast							
2019	$58.00	$68.00	$55.50	$66.00	$68.65	$59.00	$66.75
2020	$60.00	$68.00	$57.50	$66.00	$68.65	$59.00	$66.75
2021	$62.00	$67.00	$59.50	$65.00	$67.65	$58.00	$65.75
2022	$65.00	$67.00	$62.50	$65.00	$67.65	$58.00	$65.75
2023	$70.00	$72.00	$67.50	$70.00	$72.65	$63.00	$70.75
2024	$70.00	$72.00	$67.50	$70.00	$72.65	$63.00	$70.75
2025	$70.00	$72.00	$67.50	$70.00	$72.65	$63.00	$70.75
2026	$70.00	$72.00	$67.50	$70.00	$72.65	$63.00	$70.75

- International crude quality reference points for OPEC Basket, Venezuelan, Nigerian, UAE, Mexican, Chinese, Russian, and Indonesian crudes are now based on Brent in US dollars. For the purposes of this forecast Brent is receiving a premium to WTI on the world markets.
- Current forecasts for other Crude Oil reference points are based on historical trends to the WTI price.
- Brent, United Kingdom crude is based on 38.3°API with 0.37 per cent Sulphur content. Brent blend is a light sweet North Sea crude oil that serves as an international benchmark grade.
- United States Gulf Coast Argus Sour Crude Index (ASCI) is a blend of offshore Gulf Coast oil from Mars, Poseidon, and Southern Green Canyon.
- OPEC Basket represents the current grouping of crude oil prices from the OPEC member countries.
- Russia Urals 31.7°API is the FOB delivered price to the Mediterranean destinations.

Natural gas price and market demand forecast

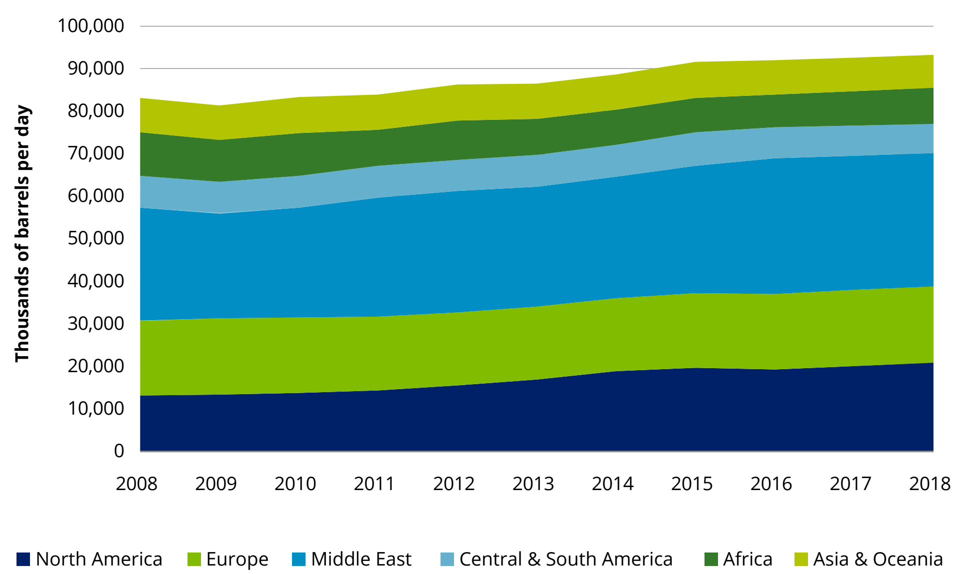
Year	USD to GBP Exchange	USD to EUR Exchange	NYMEX Henry Hub	Permian Waha	San Juan Ignacio	Rocky Mountain Opal	UK NBP	India Domestic Gas
			US$/Mcf	US$/Mcf	US$/Mcf	US$/Mcf	US$/Mcf	US$/Mcf
	Rate	Rate	Real	Real	Real	Real	Real	Real
Forecast								
2019	1.28	1.15	$3.00	$2.00	$2.25	$2.50	$7.75	$3.60
2020	1.28	1.15	$3.10	$2.10	$2.35	$2.60	$7.85	$3.80
2021	1.28	1.15	$3.30	$2.30	$2.55	$2.80	$8.05	$3.90
2022	1.28	1.15	$3.40	$2.40	$2.65	$2.90	$8.15	$4.05
2023	1.28	1.15	$3.55	$2.55	$2.80	$3.05	$8.30	$4.15
2024	1.28	1.15	$3.75	$2.75	$3.00	$3.25	$8.50	$4.25
2025	1.28	1.15	$3.90	$2.90	$3.15	$3.40	$8.65	$4.40
2026	1.28	1.15	$3.95	$2.95	$3.20	$3.45	$8.70	$4.55

Global trends

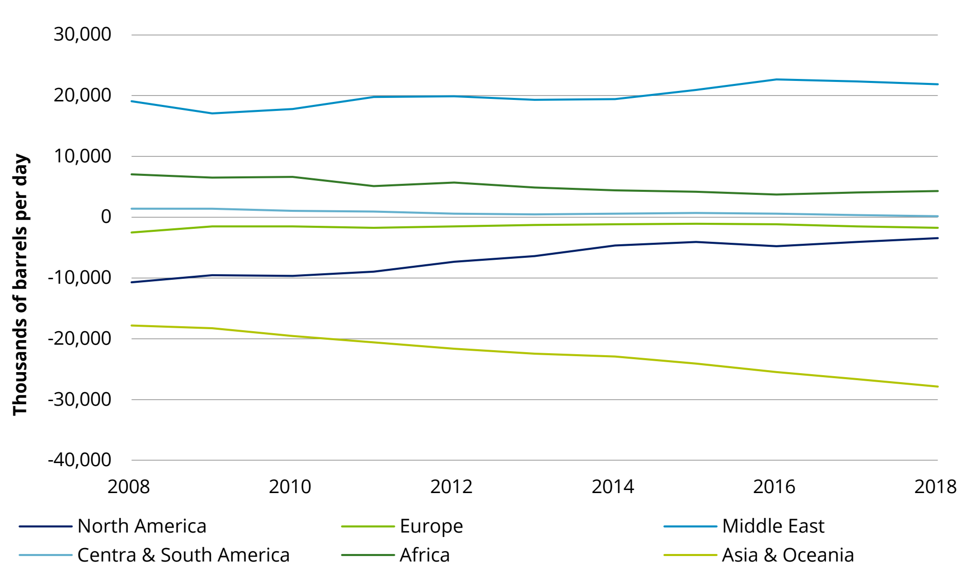
Oil

- Global oil production has continued to grow reaching over 90,000 bbl/d in 2017, representing a 0.7 percent increase from the previous year. The Middle East still holds the largest share of production at 34 percent with North America gaining ground to be almost 22 percent.
- North America continues to move towards becoming a net exporter of oil with production growth outpacing consumption. Asia has continued movement towards increasing reliance on importing oil with consumption significantly outweighing the production capacity of the region.

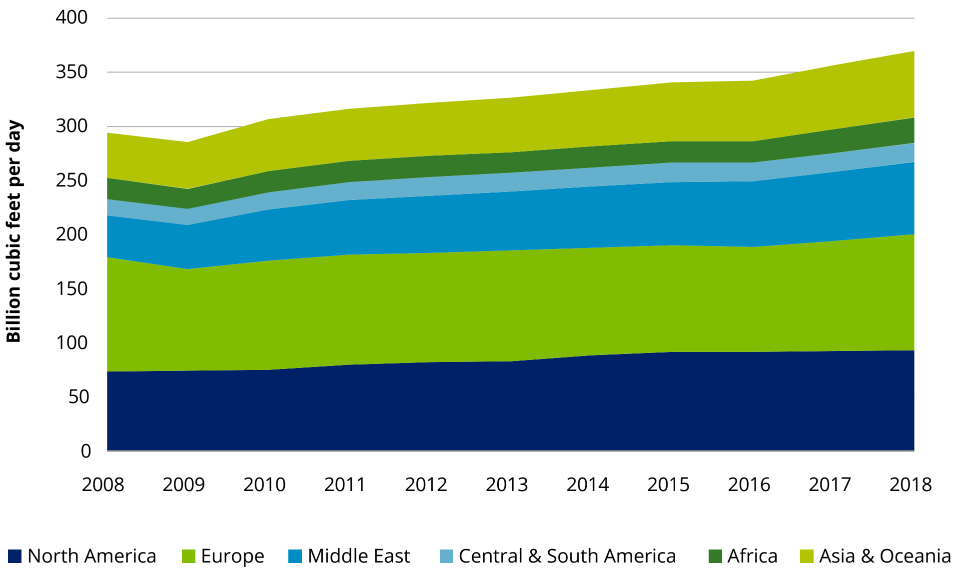
World Oil Production



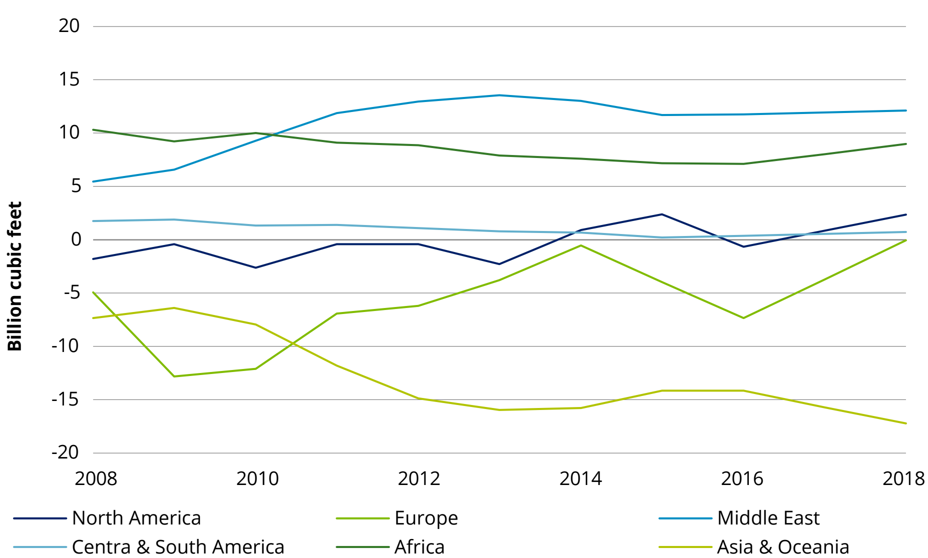
World Net Oil (Production minus Consumption)



World Gas Production



World Net Gas (Production minus Consumption)



Gas

- Global gas production is growing at a faster rate than oil, with a four percent increase in 2017. This growth is occurring throughout the world, with Europe representing the largest portion of the increase. Europe currently holds approximately 30 percent of global natural gas production, with North America close behind at 25 percent.
- With the growth in production outpacing demand growth in Europe and North America, both have begun to shift towards becoming net exporters of gas in the last couple of years. Consumption has been growing rapidly in Asia, leading to the expectation that they will continue to be the main target of LNG exports in the future.

Storage

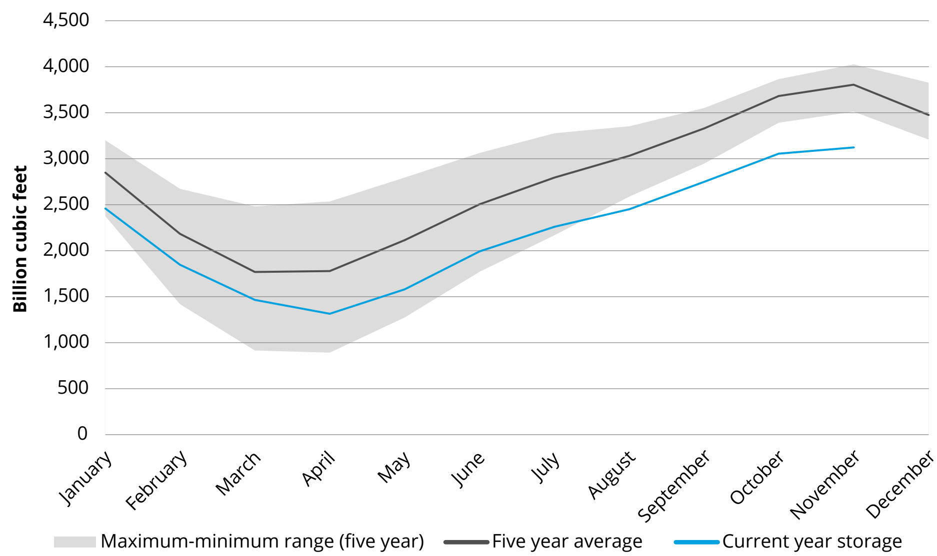
United States

- Natural gas storage in the United States is almost 20 percent below the five year average with domestic demand increasing over the past year and LNG exports ramping up. It is expected that the United States will have 9.6 Bcf/d of LNG export capability by the end of 2019.

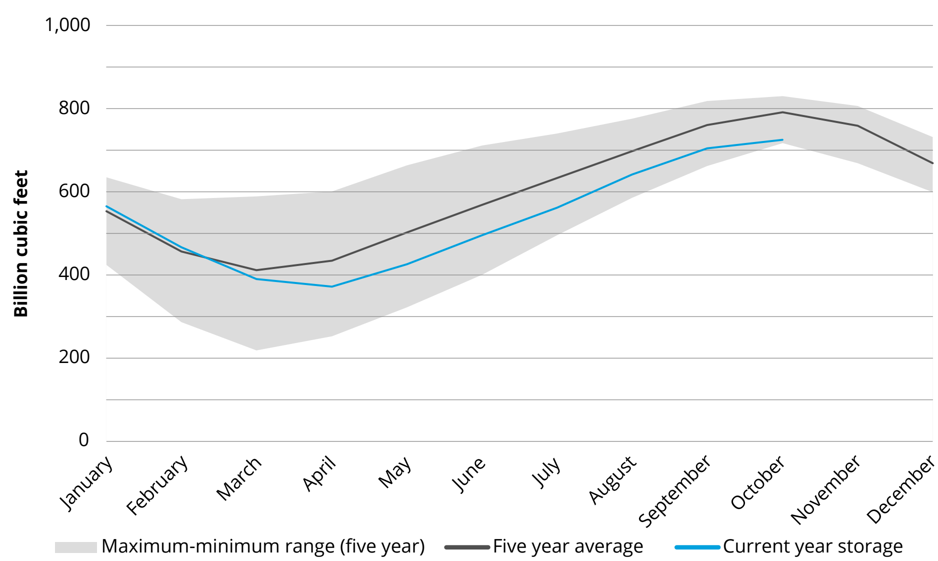
Canada

- Canadian natural gas storage is 10 percent below the five year average even with the very low prices seen in Western Canada. Demand is strong, however, exports remain at 2017 levels, causing storage to trend closer to the five year average than in the United States.

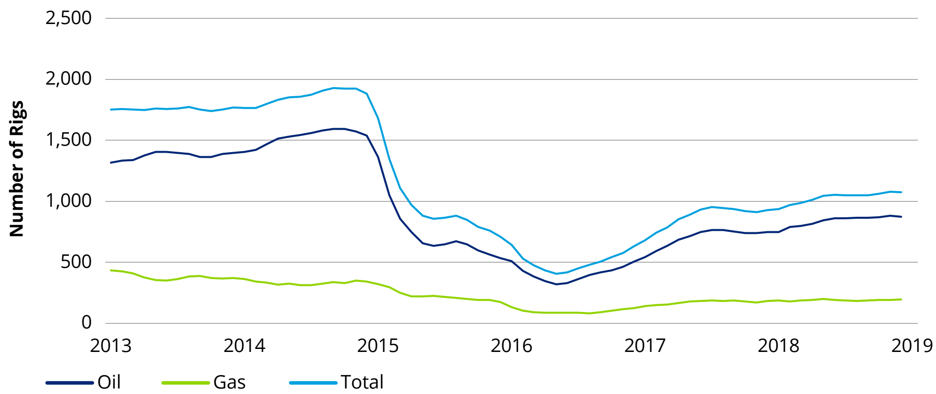
US Natural Gas Storage



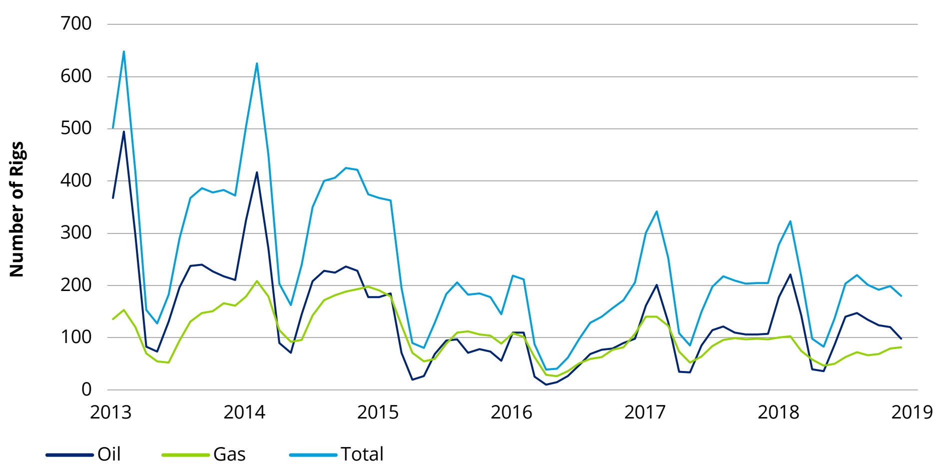
Canada Natural Gas Storage



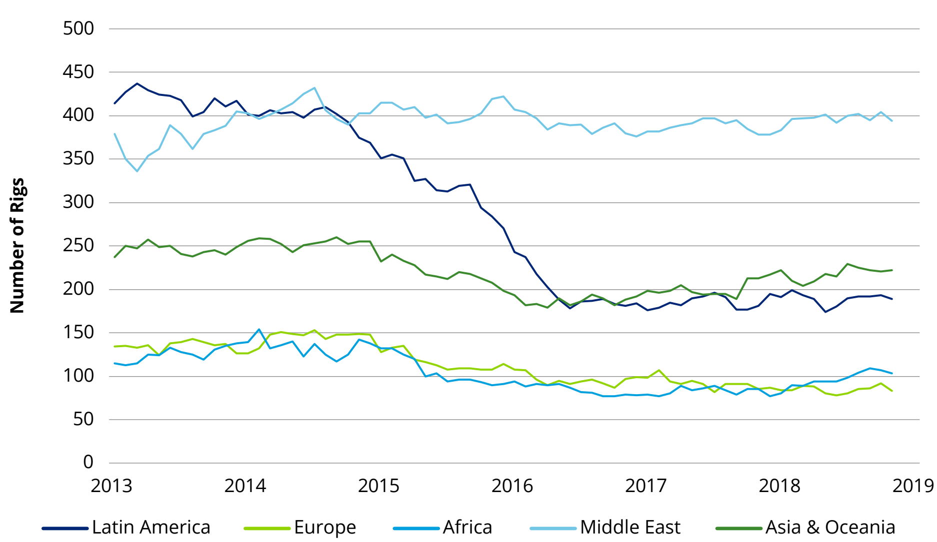
United States Rig Counts



Canada Rig Counts



International Rig Counts



Rigs

United States

- Rig counts in the United States have leveled off in the last two quarters. As prices have been lower at the end of this quarter, activity has slowed a little to reflect the uncertainty.

Canada

- Canadian rigs are down overall from this time last year as lower oil prices cut into the typical winter drilling season. It is expected that the drilling activity this winter will be hampered by the production curtailments and the lingering effects of the elevated differentials.

International

- This quarter rig counts internationally were steady in most regions. The Middle East is still the leader in international drilling with Asia the next most active region, but with almost 50 percent less rigs. North America has maintained over 55 percent of the total drilling activity globally in 2018.

Canadian domestic price tables

Year	Price Inflation	Cost Inflation	CAD to USD Exchange	Crude Oil Pricing WTI at Cushing Oklahoma	WTI at Cushing Oklahoma	Edmonton City Gate	Edmonton City Gate	WCS 20.5 Deg. API Hardisty
				US$/bbl	US$/bbl	C$/bbl	C$/bbl	C$/bbl
	Rate	Rate	Rate	Real	Current	Real	Current	Current
Historical								
2008	2.4%	2.4%	0.943	$116.90	$99.57	$120.69	$102.80	$82.95
2009	0.3%	0.3%	0.880	$70.66	$61.65	$75.76	$66.10	$58.66
2010	1.8%	1.8%	0.971	$90.72	$79.40	$88.90	$77.80	$67.22
2011	2.9%	2.9%	1.012	$106.51	$94.88	$107.24	$95.54	$77.12
2012	1.5%	1.5%	1.001	$102.56	$94.11	$94.34	$86.57	$73.10
2013	0.9%	0.9%	0.972	$105.08	$97.91	$100.20	$93.36	$74.97
2014	1.9%	1.9%	0.906	$99.15	$93.26	$99.93	$94.00	$81.06
2015	1.1%	1.1%	0.783	$50.77	$48.69	$59.44	$57.00	$44.80
2016	1.4%	1.4%	0.755	$44.50	$43.15	$53.84	$52.22	$38.90
2017	1.6%	1.6%	0.771	$51.71	$50.88	$62.89	$61.88	$50.53
2018								
12 Mths H	2.3%	2.3%	0.773	$65.20	$65.20	$68.89	$68.89	$52.24
0 Mths F	0.0%	0.0%	-	-	-	-	-	-
Avg.	N/A	N/A	0.773	$65.20	$65.20	$68.89	$68.89	$52.24
Forecast								
2019	0.0%	0.0%	0.760	$58.00	$58.00	$65.80	$65.80	$50.00
2020	2.0%	2.0%	0.760	$60.00	$61.20	$71.05	$72.45	$57.75
2021	2.0%	2.0%	0.770	$62.00	$64.50	$75.30	$78.35	$60.80
2022	2.0%	2.0%	0.790	$65.00	$69.00	$77.20	$81.95	$64.45
2023	2.0%	2.0%	0.800	$70.00	$75.75	$82.50	$89.30	$71.70
2024	2.0%	2.0%	0.800	$70.00	$77.30	$82.50	$91.10	$73.15
2025	2.0%	2.0%	0.800	$70.00	$78.85	$82.50	$92.90	$74.60
2026	2.0%	2.0%	0.800	$70.00	$80.40	$82.50	$94.75	$76.10
2027	2.0%	2.0%	0.800	$70.00	$82.00	$82.50	$96.65	$77.60
2028	2.0%	2.0%	0.800	$70.00	$83.65	$82.50	$98.60	$79.15
2029	2.0%	2.0%	0.800	$70.00	$85.35	$82.50	$100.55	$80.75
2030	2.0%	2.0%	0.800	$70.00	$87.05	$82.50	$102.60	$82.35
2031	2.0%	2.0%	0.800	$70.00	$88.80	$82.50	$104.65	$84.00
2032	2.0%	2.0%	0.800	$70.00	$90.55	$82.50	$106.70	$85.70
2033	2.0%	2.0%	0.800	$70.00	$92.35	$82.50	$108.85	$87.40
2034	2.0%	2.0%	0.800	$70.00	$94.20	$82.50	$111.05	$89.15
2035	2.0%	2.0%	0.800	$70.00	$96.10	$82.50	$113.25	$90.95
2036	2.0%	2.0%	0.800	$70.00	$98.00	$82.50	$115.50	$92.75
2037	2.0%	2.0%	0.800	$70.00	$100.00	$82.50	$117.85	$94.60
2038	2.0%	2.0%	0.800	$70.00	$102.00	$82.50	$120.20	$96.50
2038+	2.0%	2.0%	0.800	$0.00	2.0%	0.0%	2.0%	2.0%

Notes:

- All prices are in Canadian dollars except WTI and NYMEX gas which are in US dollars
- Edmonton city gate prices based on historical light oil par prices posted by the government of Alberta and Net Energy differential futures (40 Deg. API < 0.5% Sulphur)
- Real prices listed in 2019 dollars with no escalation considered

	Natural Gas Liquids Pricing Edmonton Par Prices				Natural Gas Pricing						Sulphur
Year	Ethane	Propane	Butane	Pentanes + Condensate	Alberta Reference Avg. Price	Alberta AECO Avg. Price	Alberta AECO Avg. Price	B.C. Direct Stn. 2 Sales	NYMEX Henry Hub	NYMEX Henry Hub	Alberta Plant Gate
	C$/bbl	C$/bbl	C$/bb	C$/bbl	C$/mcf	C$/mcf	C$/mcf	C$/mcf	US$/Mcf	US$/Mcf	C$/lt
	Current	Current	Current	Current	Current	Real	Current	Current	Real	Current	Current
Historical											
2008	$22.59	$56.96	$83.54	$109.77	$7.88	$9.58	$8.16	$8.20	$10.40	$8.86	$303.83
2009	$11.61	$34.62	$56.21	$69.49	$3.85	$4.54	$3.96	$4.17	$4.53	$3.95	($5.08)
2010	$11.53	$45.19	$68.79	$84.02	$3.76	$4.58	$4.01	$4.01	$5.01	$4.39	$56.94
2011	$10.30	$52.41	$86.98	$105.24	$3.46	$4.08	$3.63	$3.34	$4.49	$4.00	$101.60
2012	$6.73	$30.80	$75.47	$99.67	$2.25	$2.60	$2.39	$2.29	$3.00	$2.75	$126.81
2013	$8.68	$38.54	$77.44	$103.52	$2.98	$3.41	$3.17	$3.11	$4.00	$3.73	$62.17
2014	$12.46	$42.93	$59.43	$101.47	$4.22	$4.79	$4.50	$4.16	$4.67	$4.39	$88.99
2015	$7.49	$5.35	$33.70	$55.15	$2.56	$2.81	$2.69	$1.81	$2.74	$2.63	$107.45
2016	$6.04	$8.71	$31.45	$52.43	$1.93	$2.23	$2.16	$1.75	$2.59	$2.52	$45.40
2017	$6.11	$27.92	$40.98	$63.65	$2.13	$2.23	$2.19	$1.56	$3.03	$2.99	$41.85
2018											
12 Mths H	$6.36	$29.65	$46.90	$77.14	$1.24	$1.52	$1.52	$1.24	$3.20	$3.20	$79.73
0 Mths F	-	-	-	-	-	-	-	-	-	-	-
Avg.	$4.25	$28.83	$47.95	$80.80	$1.30	$1.52	$1.52	$1.39	$2.94	$2.94	$60.94
Forecast											
2019	$5.70	$32.90	$29.60	$75.65	$1.55	$1.75	$1.75	$1.45	$3.00	$3.00	$75.00
2020	$6.10	$36.25	$39.90	$79.70	$2.00	$2.15	$2.20	$1.90	$3.10	$3.15	$76.50
2021	$6.95	$39.15	$50.95	$86.20	$2.30	$2.40	$2.50	$2.20	$3.30	$3.45	$78.05
2022	$7.85	$40.95	$53.25	$90.10	$2.60	$2.65	$2.80	$2.50	$3.40	$3.60	$79.60
2023	$8.95	$44.65	$58.05	$98.25	$3.00	$2.95	$3.20	$2.85	$3.55	$3.85	$81.20
2024	$9.90	$45.55	$59.25	$100.20	$3.30	$3.20	$3.55	$3.20	$3.75	$4.15	$82.80
2025	$10.70	$46.45	$60.40	$102.20	$3.60	$3.40	$3.85	$3.50	$3.90	$4.40	$84.45
2026	$11.10	$47.40	$61.65	$104.25	$3.75	$3.45	$3.95	$3.60	$3.95	$4.55	$86.15
2027	$11.50	$48.35	$62.85	$106.35	$3.85	$3.50	$4.10	$3.75	$4.00	$4.70	$87.85
2028	$11.70	$49.30	$64.10	$108.45	$3.95	$3.50	$4.20	$3.80	$4.00	$4.80	$89.65
2029	$11.95	$50.30	$65.40	$110.60	$4.00	$3.50	$4.25	$3.90	$4.00	$4.90	$91.40
2030	$12.20	$51.30	$66.70	$112.85	$4.10	$3.50	$4.35	$4.00	$4.00	$4.95	$93.25
2031	$12.45	$52.30	$68.05	$115.10	$4.20	$3.50	$4.45	$4.05	$4.00	$5.05	$95.10
2032	$12.70	$53.35	$69.40	$117.40	$4.25	$3.50	$4.55	$4.15	$4.00	$5.15	$97.00
2033	$12.95	$54.45	$70.80	$119.75	$4.35	$3.50	$4.60	$4.20	$4.00	$5.30	$98.95
2034	$13.20	$55.50	$72.20	$122.15	$4.45	$3.50	$4.70	$4.30	$4.00	$5.40	$100.95
2035	$13.45	$56.65	$73.65	$124.60	$4.55	$3.50	$4.80	$4.40	$4.00	$5.50	$102.95
2036	$13.70	$57.75	$75.10	$127.05	$4.60	$3.50	$4.90	$4.50	$4.00	$5.60	$105.00
2037	$14.00	$58.90	$76.65	$129.60	$4.70	$3.50	$5.00	$4.55	$4.00	$5.70	$107.10
2038	$14.30	$60.10	$78.15	$132.20	$4.80	$3.50	$5.10	$4.65	$4.00	$5.85	$109.25
2038+	2.0%	2.0%	2.0%	2.0%	2.0%	0.0%	2.0%	2.0%	0.0%	2.0%	2.0%

Notes:

- All prices are in Canadian dollars except WTI and NYMEX gas which are in US dollars
- Natural Gas Liquid prices are forecasted at Edmonton therefore an additional transportation cost must be included to plant gate sales point
- 1 Mcf is equivalent to 1 mmbtu
- Real prices listed in 2019 dollars with no escalation considered
- Alberta gas prices, except AECO, include an average cost of service to the plant gate
- NGL prices have been switched from a mix reference to a spec reference

Additional crude reference prices

	Crude oil pricing			Natural gas pricing
Year	Lt. Sour 35 Deg. API Cromer, SK	MSO 31 Deg. API Hardisty	Synbit (AWB) 70% Bitumen 30% Cond. 21 Deg. API	Ontario Dawn Reference Point
	C$/bbl Current	C$/bbl Current	C$/bbl Current	C$/mcf Current
Historical				
2008	$95.28	$92.40	$84.08	$9.88
2009	$64.04	$63.76	$58.92	$4.80
2010	$76.40	$72.32	$67.64	$4.79
2011	$92.13	$83.39	$80.29	$4.34
2012	$84.27	$77.53	$74.75	$3.11
2013	$91.76	$82.65	$76.90	$4.13
2014	$92.91	$89.39	$82.03	$5.76
2015	$55.46	$54.70	$44.28	$3.72
2016	$51.37	$48.29	$39.58	$3.46
2017	$62.06	$58.16	$50.60	$3.97
2018				
12 Mths H	$74.79	$61.81	$54.71	$4.15
0 Mths F	-	-	-	-
Avg.	$74.79	$61.81	$54.71	$4.15
Forecast				
2019	$68.80	$60.80	$52.80	$3.90
2020	$73.50	$67.35	$60.75	$4.15
2021	$79.40	$73.15	$64.75	$4.40
2022	$83.00	$76.60	$68.45	$4.50
2023	$90.40	$83.90	$75.90	$4.75
2024	$92.20	$85.55	$77.40	$5.15
2025	$94.05	$87.30	$78.95	$5.45
2026	$95.90	$89.00	$80.50	$5.65
2027	$97.85	$90.80	$82.15	$5.80
2028	$99.80	$92.60	$83.80	$5.90
2029	$101.80	$94.45	$85.45	$6.05
2030	$103.80	$96.35	$87.15	$6.15
2031	$105.90	$98.30	$88.90	$6.30
2032	$108.00	$100.25	$90.70	$6.40
2033	$110.20	$102.25	$92.50	$6.55
2034	$112.40	$104.30	$94.35	$6.65
2035	$114.65	$106.40	$96.25	$6.80
2036	$116.90	$108.50	$98.15	$6.95
2037	$119.25	$110.70	$100.10	$7.05
2038	$121.65	$112.90	$102.10	$7.20
2038+	2.0%	2.0%	2.0%	2.0%

Notes:

- All prices are in Canadian dollars except WTI and NYMEX gas which are in US dollars
- Edmonton city gate prices based on historical light oil par prices posted by the government of Alberta and Net Energy differential futures (40 Deg. API < 0.5% Sulphur)
- Natural Gas Liquid prices are forecasted at Edmonton therefore an additional transportation cost must be included to plant gate sales point
- 1 Mcf is equivalent to 1 mmbtu
- Real prices listed in 2019 dollars with no escalation considered
- Alberta gas prices, except AECO, include an average cost of service to the plant gate
- NGL prices have been switched from a mix reference to a spec reference

International price tables

Year	Crude Oil Pricing															
	Average WTI Spot	Alaskan North Slope	California Midway-Sunset	Louisiana Heavy Sweet	Louisiana Light Sweet	MARS Blend	Wyoming Sweet	Brent Spot	Gulf Coast Argus Sour Crude Index ASCI	Average OPEC Basket	Venezuelan Merey	Nigerian Bonny Light	Arabia UAE Dubai Feteh	Mexico Maya	Russia Urals	Indonesia Minas
	US$/bbl	US$/bbl	US$/bbl	US$/bbl	US$/bbl	US$/bbl	US$/bbl	US$/bbl	US$/bbl	US$/bbl	US$/bbl	US$/bbl	US$/bbl	US$/bbl	US$/bbl	US$/bbl
	Real	Real	Real	Real	Real	Real	Real	Real	Real	Real	Real	Real	Real	Real	Real	Real
Forecast																
2019	$58.00	$54.50	$59.00	$59.00	$57.50	$55.50	$55.00	$68.00	$55.50	$66.00	$60.00	$68.65	$66.00	$59.00	$66.75	$61.00
2020	$60.00	$56.50	$61.00	$61.00	$59.50	$57.50	$57.00	$68.00	$57.50	$66.00	$60.00	$68.65	$66.00	$59.00	$66.75	$61.00
2021	$62.00	$58.50	$63.00	$63.00	$61.50	$59.50	$59.00	$67.00	$59.50	$65.00	$59.00	$67.65	$65.00	$58.00	$65.75	$60.00
2022	$65.00	$61.50	$66.00	$66.00	$64.50	$62.50	$62.00	$67.00	$62.50	$65.00	$59.00	$67.65	$65.00	$58.00	$65.75	$60.00
2023	$70.00	$66.50	$71.00	$71.00	$69.50	$67.50	$67.00	$72.00	$67.50	$70.00	$64.00	$72.65	$70.00	$63.00	$70.75	$65.00
2024	$70.00	$66.50	$71.00	$71.00	$69.50	$67.50	$67.00	$72.00	$67.50	$70.00	$64.00	$72.65	$70.00	$63.00	$70.75	$65.00
2025	$70.00	$66.50	$71.00	$71.00	$69.50	$67.50	$67.00	$72.00	$67.50	$70.00	$64.00	$72.65	$70.00	$63.00	$70.75	$65.00
2026	$70.00	$66.50	$71.00	$71.00	$69.50	$67.50	$67.00	$72.00	$67.50	$70.00	$64.00	$72.65	$70.00	$63.00	$70.75	$65.00
2027	$70.00	$66.50	$71.00	$71.00	$69.50	$67.50	$67.00	$72.00	$67.50	$70.00	$64.00	$72.65	$70.00	$63.00	$70.75	$65.00
2028	$70.00	$66.50	$71.00	$71.00	$69.50	$67.50	$67.00	$72.00	$67.50	$70.00	$64.00	$72.65	$70.00	$63.00	$70.75	$65.00
2029	$70.00	$66.50	$71.00	$71.00	$69.50	$67.50	$67.00	$72.00	$67.50	$70.00	$64.00	$72.65	$70.00	$63.00	$70.75	$65.00
2030	$70.00	$66.50	$71.00	$71.00	$69.50	$67.50	$67.00	$72.00	$67.50	$70.00	$64.00	$72.65	$70.00	$63.00	$70.75	$65.00
2031	$70.00	$66.50	$71.00	$71.00	$69.50	$67.50	$67.00	$72.00	$67.50	$70.00	$64.00	$72.65	$70.00	$63.00	$70.75	$65.00
2032	$70.00	$66.50	$71.00	$71.00	$69.50	$67.50	$67.00	$72.00	$67.50	$70.00	$64.00	$72.65	$70.00	$63.00	$70.75	$65.00
2033	$70.00	$66.50	$71.00	$71.00	$69.50	$67.50	$67.00	$72.00	$67.50	$70.00	$64.00	$72.65	$70.00	$63.00	$70.75	$65.00
2034	$70.00	$66.50	$71.00	$71.00	$69.50	$67.50	$67.00	$72.00	$67.50	$70.00	$64.00	$72.65	$70.00	$63.00	$70.75	$65.00
2035	$70.00	$66.50	$71.00	$71.00	$69.50	$67.50	$67.00	$72.00	$67.50	$70.00	$64.00	$72.65	$70.00	$63.00	$70.75	$65.00
2036	$70.00	$66.50	$71.00	$71.00	$69.50	$67.50	$67.00	$72.00	$67.50	$70.00	$64.00	$72.65	$70.00	$63.00	$70.75	$65.00
2037	$70.00	$66.50	$71.00	$71.00	$69.50	$67.50	$67.00	$72.00	$67.50	$70.00	$64.00	$72.65	$70.00	$63.00	$70.75	$65.00
2038	$70.00	$66.50	$71.00	$71.00	$69.50	$67.50	$67.00	$72.00	$67.50	$70.00	$64.00	$72.65	$70.00	$63.00	$70.75	$65.00
2038+	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Notes:

- Venezuelan Merey replaced BCF-17 in the OPEC basket March 1, 2009.

			Natural Gas pricing						Ethanol
Year	USD to GBP	USD to EUR	NYMEX Henry Hub	Permian Waha	San Juan Ignacio	Rocky Mtn. Opal	UK NBP	India Domestic Gas	US CBOT Ethanol
	Exchange rate	Exchange rate	US$/Mcf Real	US$/Mcf Real	US$/Mcf Real	US$/Mcf Real	US$/Mcf Real	US$/Mcf Real	US$/gal Real
Forecast									
2019	1.280	1.150	$3.00	$2.00	$2.25	$2.50	$7.75	$3.60	$1.25
2020	1.280	1.150	$3.10	$2.10	$2.35	$2.60	$7.85	$3.80	$1.25
2021	1.280	1.150	$3.30	$2.30	$2.55	$2.80	$8.05	$3.90	$1.25
2022	1.280	1.150	$3.40	$2.40	$2.65	$2.90	$8.15	$4.05	$1.25
2023	1.280	1.150	$3.55	$2.55	$2.80	$3.05	$8.30	$4.15	$1.25
2024	1.280	1.150	$3.75	$2.75	$3.00	$3.25	$8.50	$4.25	$1.25
2025	1.280	1.150	$3.90	$2.90	$3.15	$3.40	$8.65	$4.40	$1.25
2026	1.280	1.150	$3.95	$2.95	$3.20	$3.45	$8.70	$4.55	$1.25
2027	1.280	1.150	$4.00	$3.00	$3.25	$3.50	$8.75	$4.60	$1.25
2028	1.280	1.150	$4.00	$3.00	$3.25	$3.50	$8.75	$4.60	$1.25
2029	1.280	1.150	$4.00	$3.00	$3.25	$3.50	$8.75	$4.60	$1.25
2030	1.280	1.150	$4.00	$3.00	$3.25	$3.50	$8.75	$4.60	$1.25
2031	1.280	1.150	$4.00	$3.00	$3.25	$3.50	$8.75	$4.60	$1.25
2032	1.280	1.150	$4.00	$3.00	$3.25	$3.50	$8.75	$4.60	$1.25
2033	1.280	1.150	$4.00	$3.00	$3.25	$3.50	$8.75	$4.60	$1.25
2034	1.280	1.150	$4.00	$3.00	$3.25	$3.50	$8.75	$4.60	$1.25
2035	1.280	1.150	$4.00	$3.00	$3.25	$3.50	$8.75	$4.60	$1.25
2036	1.280	1.150	$4.00	$3.00	$3.25	$3.50	$8.75	$4.60	$1.25
2037	1.280	1.150	$4.00	$3.00	$3.25	$3.50	$8.75	$4.60	$1.25
2038	1.280	1.150	$4.00	$3.00	$3.25	$3.50	$8.75	$4.60	$1.25
2038+	1.280	1.150	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Pricing philosophy

Price forecasting takes into account many variables that can influence future prices. Our experience tells us that we must continually review the forecasting tools we use to predict where oil and gas prices are heading. However, one constant influence on oil and gas pricing is the geo-political landscape. This impact is most accurately reflected in the financial industry's futures market for commodities, a main influence when Deloitte creates its price forecast. In other words, Deloitte looks to both the futures and the past when we create our forecasts.

This pricing philosophy challenges conventional thinking. The traditional view is based on the mean-reversion view of commodities presented by economists. Following this model, industry forecasts from 2000 to 2006 reflected a drop in prices over the long term from the current prices of the day – even though the futures market indicated otherwise. While the mean-reversion approach definitely has some merit, history has tended to reflect that the futures market is a more accurate barometer.

Client focus

At Deloitte, we believe it is part of our role to help our clients in both the oil and gas sector and the investment community make better long-term business decisions by providing them with the most accurate and realistic information. We understand that sound analysis of changing trends can influence decisions on mergers, acquisitions, divestitures and investments. One way we ensure our price forecasts are as accurate as possible, given the continuing impact of near-term volatility, is to review our pricing assumptions on a quarterly basis.

Our process

In preparing the price forecast, Deloitte considers the current monthly trends, the actual price and trends for the year-to-date and the prior year actual prices. The base forecast for both oil and gas is based on New York Mercantile Exchange (NYMEX) futures in US dollars.

Crude oil and natural gas forecasts are based on yearly variable factors, weighted to a higher percent for the current data and then reflect a higher percent to prior year historical data for the later years. Gas prices have been determined independently from oil prices, but still reflect the current competitive nature of the two fuels and historical oil-to-gas ratios for the latter years of the gas forecast.

Deloitte prepares our price and market forecasts based on information we collect from numerous government agencies, industry publications, oil refineries, natural gas marketers and industry trends. Inflation forecasts and exchange rates are also an integral part of the forecast.

These forecasts are Deloitte's best estimate of how the future will look, and while they are considered reasonable, changing market conditions or additional information may require alteration from the indicated effective date.

Glossary

Some of the words, phrases and acronyms we use frequently when talking about pricing are listed below:

AECO	Alberta Energy Company - historical name of a virtual trading hub on the NGX system
ANS	Alaska North Slope
ASCI	Argus Sour Crude Oil
AWB	Access Western Blend - Canadian condensate/bitumen mix
BR	Bow River Crude Oil
CAPP	Canadian Association of Petroleum Producers
CBOT	Chicago Board Of Trade
CGA	Canadian Gas Association
CME	Chicago Mercantile Exchange
DCQ	Daily Contract Quantity
DOB	Daily Oil Bulletin
EIA	Energy Information Administration
FERC	US Federal Energy Regulatory Commission
FOB	Free on Board (shipper term)
IEA	International Energy Administration
LLB	Lloydminster Blend Crude Oil
LNG	Liquefied Natural Gas
MESC	Middle East Sour Crude
MSO	Mixed Sour Crude Oil
MSW	Canadian Light Sweet
NEB	Canadian National Energy Board
NGX	Natural Gas Exchange
NIT	Nova Inventory Transfer
NRC	Natural Resources Canada
NYMEX	New York Mercantile Exchange
OECD	Organization of Economic Cooperation and Development
OPEC	Organization of Petroleum Exporting Countries
PADD	Petroleum Administration Defense District
USGC	US Gulf Coast
USWC	US West Coast
WCS	Western Canada Select Crude Oil
WTI	West Texas Intermediate
WTS	West Texas Sour

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