



Price forecast

March 31, 2017

Resource Evaluation & Advisory

Forecast commentary

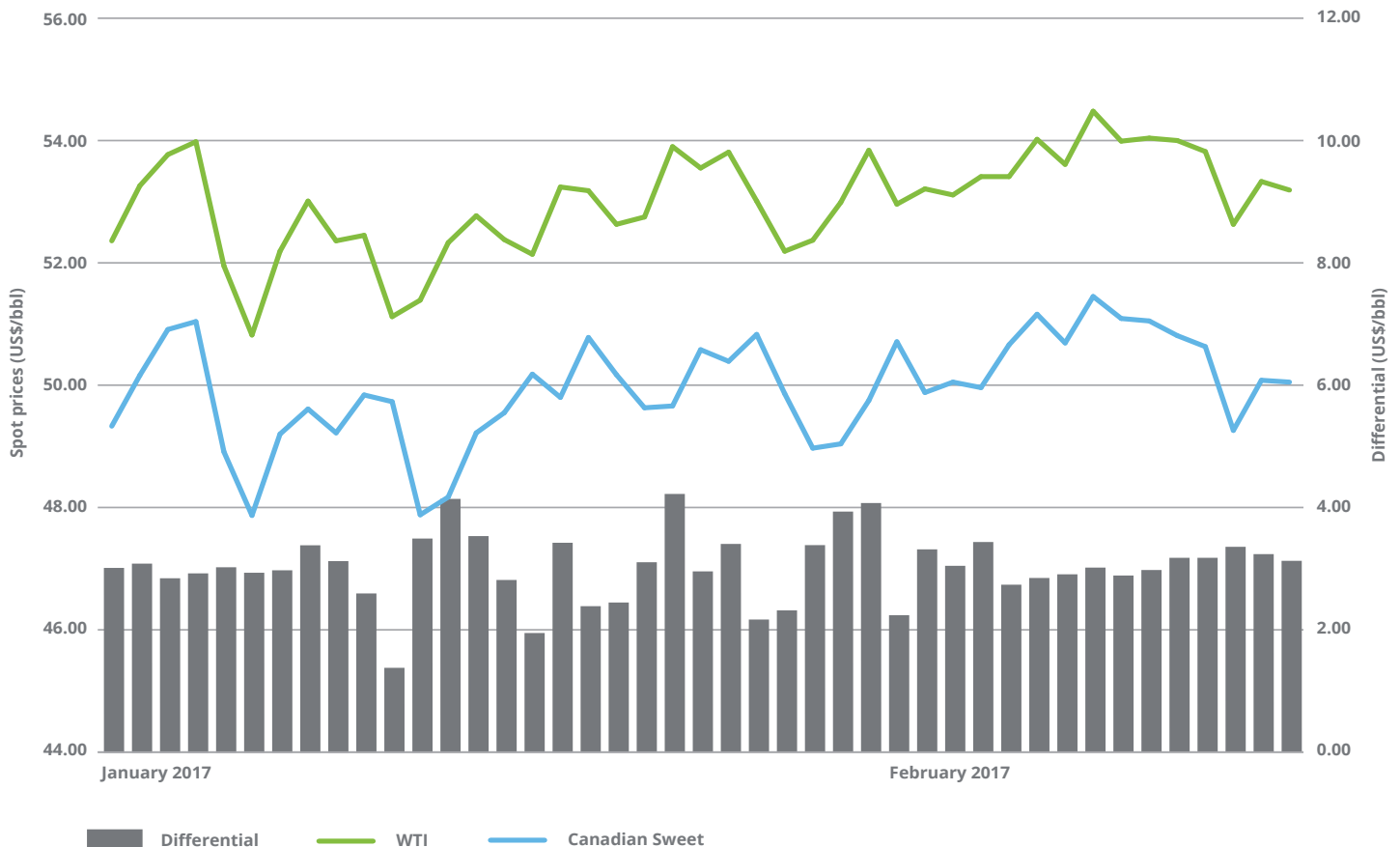
"No winter lasts forever; no spring skips its turn."

-Hal Borland, author

The past quarter has been a busy time for North American oil producers. Activity ramped up in both the United States and Canada as optimism flooded the market after OPEC announced and began to follow through with production cuts. Prices, which had been stuck within a relatively tight

band of US\$50/bbl to US\$55/bbl since the beginning of 2017, dropped below \$50/bbl during the second week of March on fears that demand in 2017 may still not grow enough to overcome supply. Canadian Sweet oil prices have followed closely, with an average differential of US\$3/bbl to WTI.

Figure 1: Oil spot prices



Source: US Energy Information Administration, Net Energy (DOB)



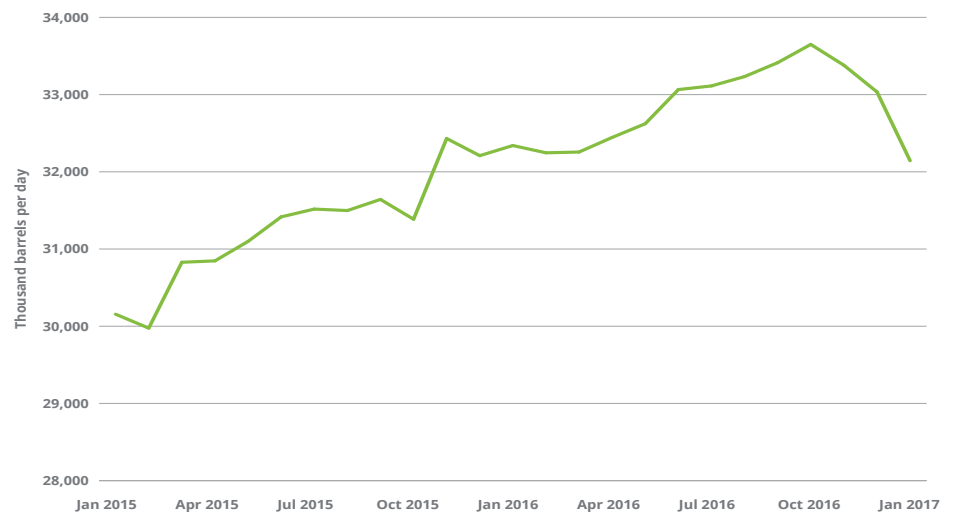


As of January, OPEC had cut production to just over 32 million barrels per day, a decrease of 1.5 million barrels per day since October 2016. While this is a significant cut, production from OPEC countries is still approximately two million barrels per

day higher than two years ago. Non-OPEC countries had also agreed to production cuts amounting to about 0.6 million barrels per day, but compliance with this cut has not been as great.



Figure 2: OPEC crude oil production



Source: OPEC production

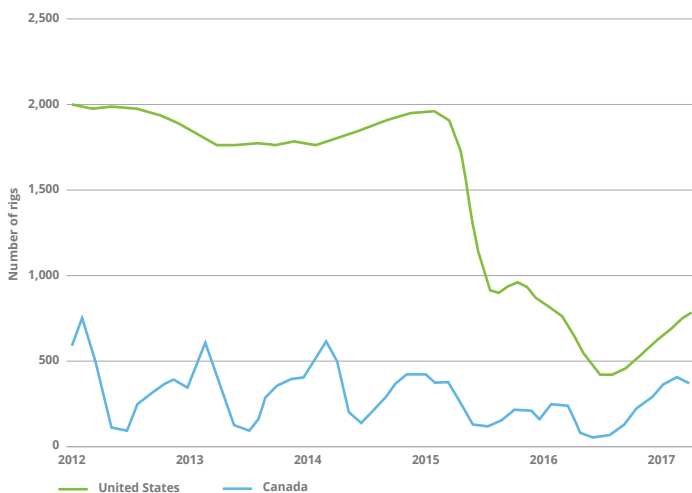
As OPEC has been working to reduce production, the North American market has been ramping up operations in an effort to make up for stagnant production levels in the previous two years. Total United States drilling activity has been on the rise since May 2016, with drilling rig counts in March 2017 reaching levels not seen since late 2015. Oil production has begun to follow suit, rising by about 0.5 million barrels per day since August 2016. Canadian production has been steadier, having plateaued since mid-2015. Rig activity has been on the rise through most of 2016, reaching levels

not seen since early 2015. This increase in activity may result in production beginning to rise again through 2017.

Along with increased production, United States stockpiles have also been increasing. These stockpiles have maintained record levels since June 2016 at 1.2 billion barrels, and the latest numbers from the EIA indicate February levels continue to grow to historic highs. This will likely act as a damper on oil price growth, as production decreases from OPEC nations can be offset by drawing down on this massive reserve of oil.

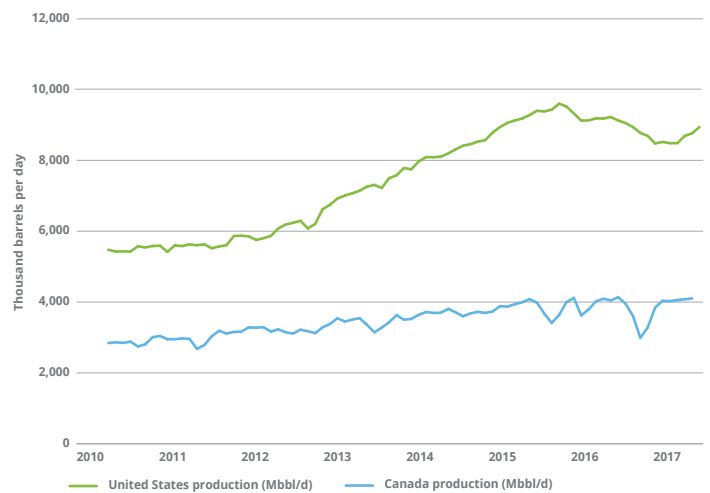
Our oil forecast continues to show slow growth over the coming years. There is a risk of volatility in the market later this year when OPEC decides whether to continue its production cuts and once the full effect of the recent increase in United States drilling is realized. In the long term, higher oil prices are needed to spur investment in major projects that can meet the global demand, but for the short term, the North American market looks to be able to fill any gap in the supply-demand balance. For the remainder of 2017, our forecast WTI price is \$52/bbl USD and our Edmonton price is \$65/bbl CAD.

Figure 3: North American total rig count



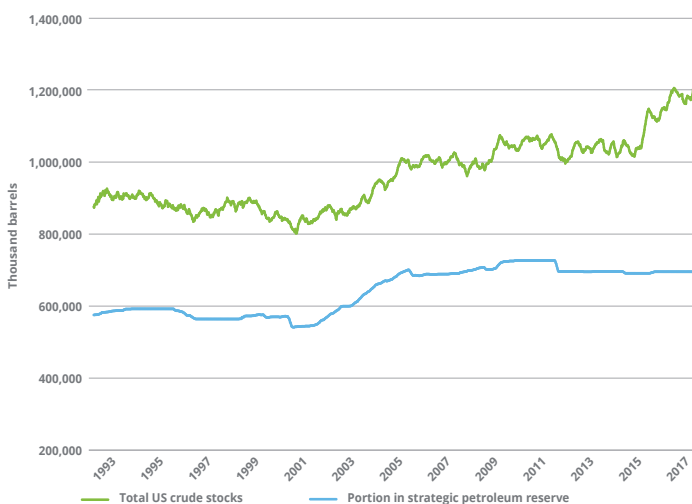
Source: Baker Hughes Incorporated

Figure 4: United States and Canada crude oil production



Source: US Energy Information Administration, NEB

Figure 5: United States crude oil stockpile volumes



Source: US Energy Information Administration



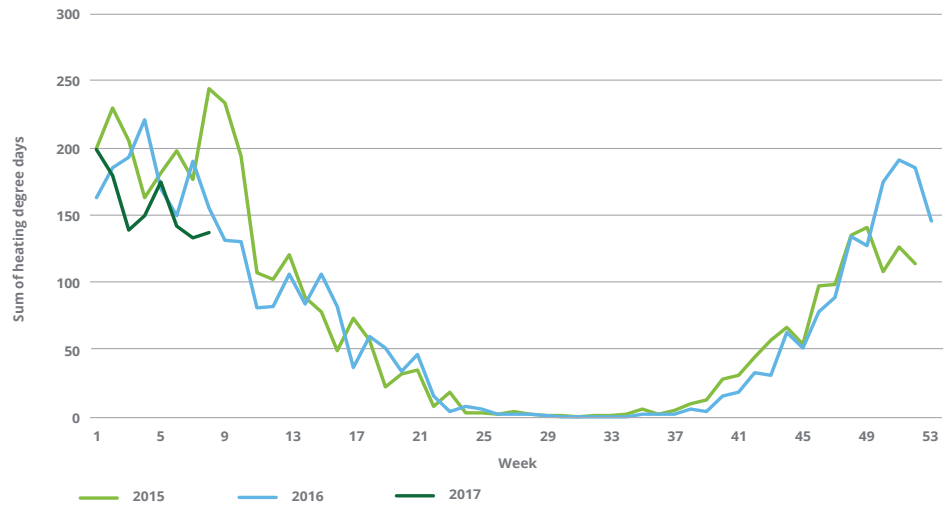
The cold winter gas producers were hoping for this year has not materialized in the United States as a whole. The average heating days for this quarter have lagged well behind the last two years, which was also a historically warm winter.

With this warm winter, Henry Hub prices deteriorated from the high of \$3.42/MMBTU in January to a low of \$2.56/MMBTU in February before rallying to a level just below \$3.00/MMBTU. United States natural gas storage is still quite high but has backed off

from the record levels seen this time last year. Production levels at the end of 2016 were holding steady at 76 Bcf/d in the United States. This led to an unprecedented storage build in February, a month which historically sees storage draws. The softening of the Henry Hub gas prices over the last quarter has led to Canadian gas prices taking a hit as well. AECO has softened considerably, and the differential between AECO and Henry Hub has widened as Canadian gas is not in high demand south of the border.

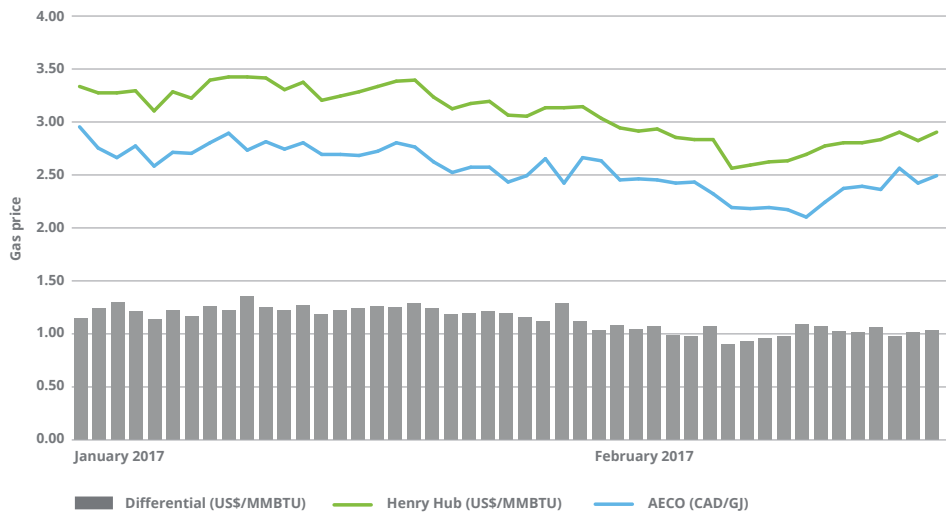


Figure 6: United States heating days



Source: NQAA

Figure 7: Natural gas prices



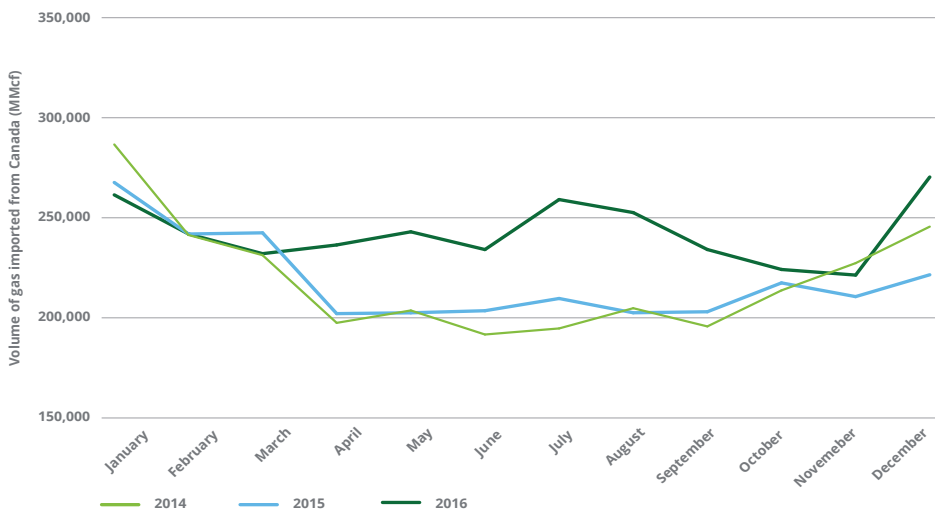
Source: NGX (DOB)

Canadian natural gas is still being exported at similar rates to those seen in the last few years, but United States natural gas is also being imported into markets in Eastern Canada at record rates. The Marcellus play sits directly south of Toronto, and operators have been steadily developing it even in the face of low prices. The mainline that takes gas from west to east in Canada has not been fully utilized as Western Canada operators seem to be trying to expand into the United States rather than Eastern Canada, although that may change with

recent efforts to increase the utilization along the main line.

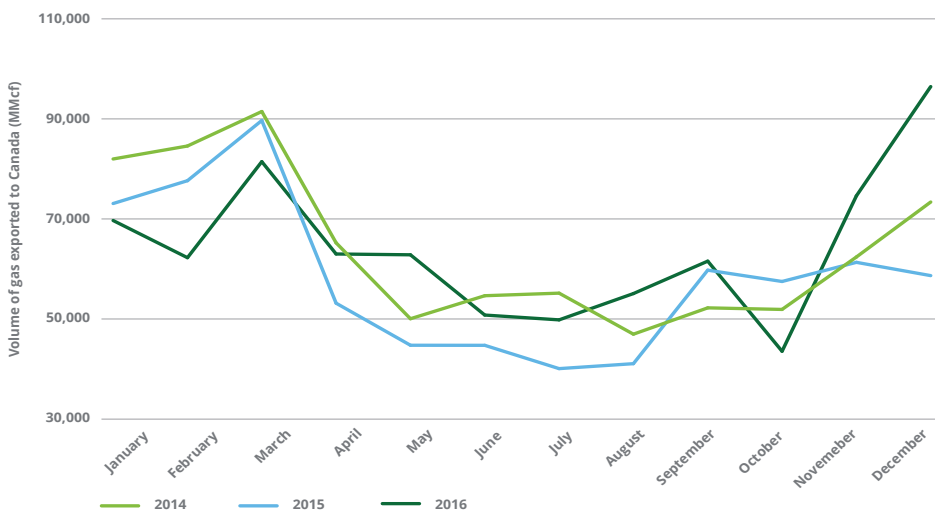
We do not see the natural gas market changing drastically in the near future and have revised our natural gas prices to reflect the current situation. For 2017, AECO is forecast to be \$2.55/Mcf CAD and Henry Hub is forecast to be \$3.20/Mcf USD.

Figure 8: Natural gas imports to United States from Canada



Source: US Energy Information Administration

Figure 9: Natural gas exports from United States to Canada

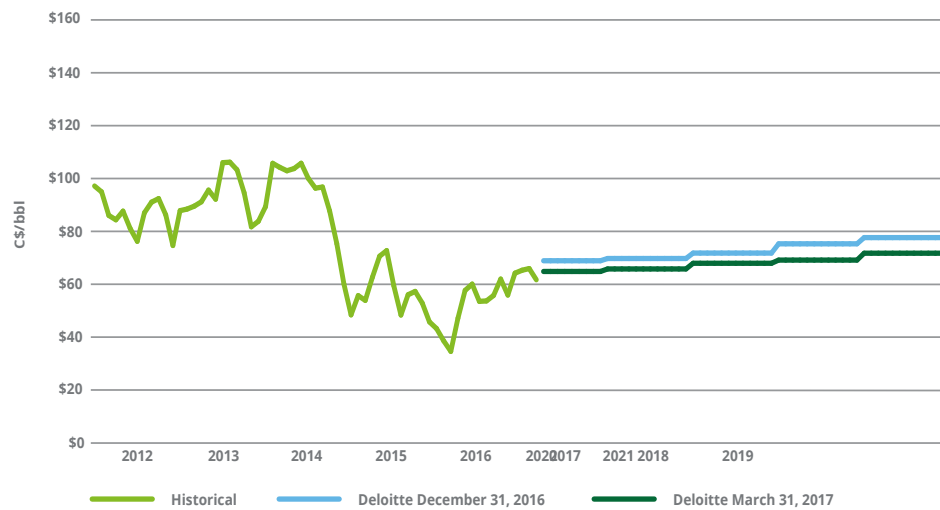


Source: US Energy Information Administration

Canadian domestic price forecast

Crude oil price and market demand forecast

Edmonton par (real \$)



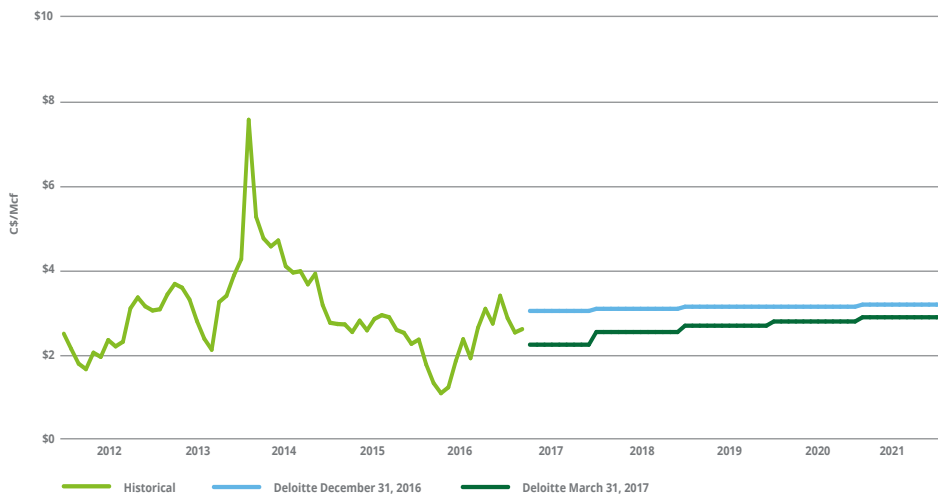
Forecast commentary

- 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) US\$/bbl Real	WTI Cushing, OK (40° API) US\$/bbl Current	Edmonton City Gate (40° API) C\$/bbl Real	Edmonton City Gate (40° API) C\$/bbl Current	WCS 20.5° API Hardisty C\$/bbl Current	Heavy Oil Hardisty (12° API) C\$/bbl Current	Cost Inflation Rate	CAD to USD exchange Rate
Historical								
2014	\$96.15	\$93.26	\$96.91	\$94.00	\$81.06	\$73.70	0.019	0.906
2015	\$49.96	\$48.69	\$58.49	\$57.00	\$44.80	\$39.63	0.011	0.783
2016	\$43.79	\$43.15	\$52.98	\$52.22	\$38.90	\$34.08	0.014	0.755
2017								
3 Months H	\$51.66	\$51.66	\$64.32	\$64.32	\$49.14	\$43.41	0.020	0.755
9 Months F	\$52.00	\$52.00	\$64.85	\$64.85	\$49.85	\$44.85	0.000	0.740
Avg.	\$51.91	\$51.91	\$64.72	\$64.72	\$49.67	\$44.49	-	0.744
Forecast								
2017	\$52.00	\$52.00	\$64.85	\$64.85	\$49.85	\$44.85	0.000	0.740
2018	\$54.00	\$55.10	\$65.80	\$67.10	\$51.80	\$46.70	0.020	0.760
2019	\$57.00	\$59.30	\$67.95	\$70.70	\$55.10	\$49.90	0.020	0.780
2020	\$60.00	\$63.65	\$69.15	\$73.40	\$57.45	\$52.15	0.020	0.810
2021	\$65.00	\$70.35	\$71.75	\$77.65	\$61.45	\$56.00	0.020	0.850
2022	\$70.00	\$77.30	\$77.65	\$85.75	\$69.15	\$63.65	0.020	0.850
2023	\$70.00	\$78.85	\$77.65	\$87.45	\$70.55	\$64.90	0.020	0.850
2024	\$70.00	\$80.40	\$77.65	\$89.20	\$71.95	\$66.20	0.020	0.850

Natural gas price and market demand forecast

AECO natural gas (real \$)



Forecast commentary

- The AECO natural gas price is forecast based on historical differentials to Henry Hub and future contracts traded on the NGX based in Calgary.
- In contrast to other forecasts in the industry, Deloitte's long-term views consider two more years of growth in terms of real dollars.

Year	AB Ref. Avg. Price	AB AECO Avg. Price	AB AECO Avg. Price	B.C. Direct Station 2 Sales	NYMEX Henry Hub	NYMEX Henry Hub
	C\$/mcf	C\$/mcf	C\$/mcf	C\$/mcf	US\$/Mcf	US\$/Mcf
	Current	Real	Current	Current	Real	Current
Historical						
2014	\$4.22	\$4.64	\$4.50	\$4.16	\$4.53	\$4.39
2015	\$2.56	\$2.76	\$2.69	\$1.81	\$2.70	\$2.63
2016	\$1.93	\$2.19	\$2.16	\$1.75	\$2.55	\$2.52
2017						
3 Months H	\$2.38	\$2.68	\$2.68	\$2.49	\$2.96	\$2.96
9 Months F	\$2.25	\$2.55	\$2.55	\$2.15	\$3.20	\$3.20
Avg.	\$2.28	\$2.58	\$2.58	\$2.24	\$3.14	\$3.14
Forecast						
2017	\$2.25	\$2.55	\$2.55	\$2.15	\$3.20	\$3.20
2018	\$2.60	\$2.75	\$2.80	\$2.40	\$3.25	\$3.30
2019	\$2.80	\$2.90	\$3.00	\$2.60	\$3.30	\$3.45
2020	\$2.95	\$3.00	\$3.20	\$2.75	\$3.35	\$3.55
2021	\$3.15	\$3.10	\$3.35	\$2.90	\$3.40	\$3.70
2022	\$3.35	\$3.25	\$3.60	\$3.15	\$3.50	\$3.85
2023	\$3.60	\$3.40	\$3.85	\$3.40	\$3.65	\$4.10
2024	\$3.95	\$3.65	\$4.20	\$3.75	\$3.85	\$4.40

International price forecast

Crude oil price and market demand forecast

Year	Avg. 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 Real	US\$/bbl Real	US\$/bbl Real	US\$/bbl Real	US\$/bbl Real	US\$/bbl Real	US\$/bbl Rate
Forecast							
2017	\$52.00	\$53.00	\$45.50	\$51.00	\$53.40	\$45.50	\$51.50
2018	\$54.00	\$55.00	\$47.50	\$53.00	\$55.40	\$47.50	\$53.50
2019	\$57.00	\$58.00	\$50.50	\$56.00	\$58.40	\$50.50	\$56.50
2020	\$60.00	\$61.00	\$53.50	\$59.00	\$61.40	\$53.50	\$59.50
2021	\$65.00	\$66.00	\$58.50	\$64.00	\$66.40	\$58.50	\$64.50
2022	\$70.00	\$71.00	\$63.50	\$69.00	\$71.40	\$63.50	\$69.50
2023	\$70.00	\$71.00	\$63.50	\$69.00	\$71.40	\$63.50	\$69.50
2024	\$70.00	\$71.00	\$63.50	\$69.00	\$71.40	\$63.50	\$69.50

Forecast commentary

- 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 GBP Exchange	NYMEX Henry Hub	Permian Waha	San Juan Ignacio	Rocky Mtn Opal	UK NBP	India Domestic Gas
	Rate	Rate	US\$/Mcf Real	US\$/Mcf Real	US\$/Mcf Real	US\$/Mcf Real	US\$/Mcf Real	US\$/Mcf Real
Forecast								
2017	1.250	1.050	\$3.20	\$2.95	\$2.95	\$2.95	\$5.20	\$2.70
2018	1.250	1.050	\$3.25	\$3.00	\$3.00	\$3.00	\$5.25	\$3.05
2019	1.250	1.050	\$3.30	\$3.05	\$3.05	\$3.05	\$5.30	\$3.10
2020	1.250	1.050	\$3.35	\$3.10	\$3.10	\$3.10	\$5.35	\$3.15
2021	1.250	1.050	\$3.40	\$3.15	\$3.15	\$3.15	\$5.40	\$3.20
2022	1.250	1.050	\$3.50	\$3.25	\$3.25	\$3.25	\$5.50	\$3.25
2023	1.250	1.050	\$3.65	\$3.40	\$3.40	\$3.40	\$5.65	\$3.35
2024	1.250	1.050	\$3.85	\$3.60	\$3.60	\$3.60	\$5.85	\$3.50

Forecast commentary

- The NYMEX price is based on delivery at the Henry Hub in Louisiana, the nexus of 16 intra- and interstate natural gas pipeline systems that draw supplies from the region's prolific gas deposits.

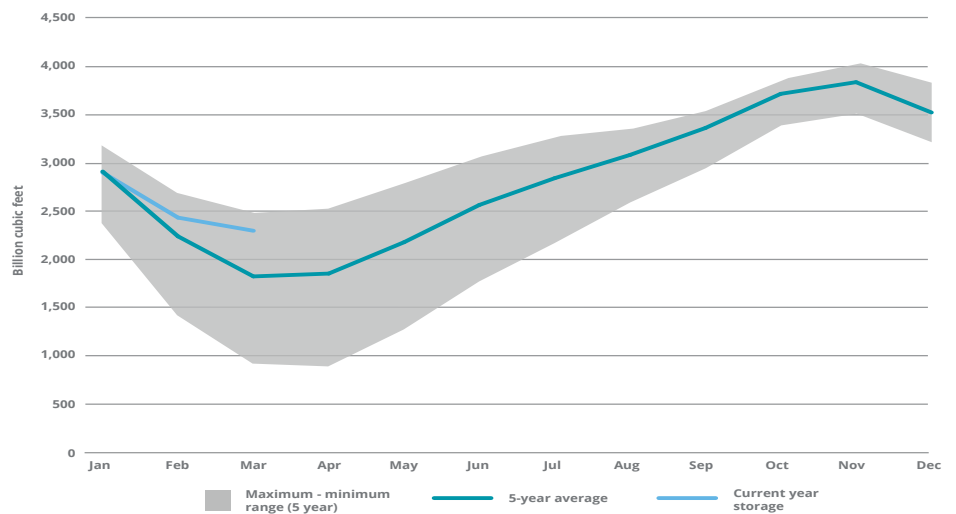
Global trends

Storage

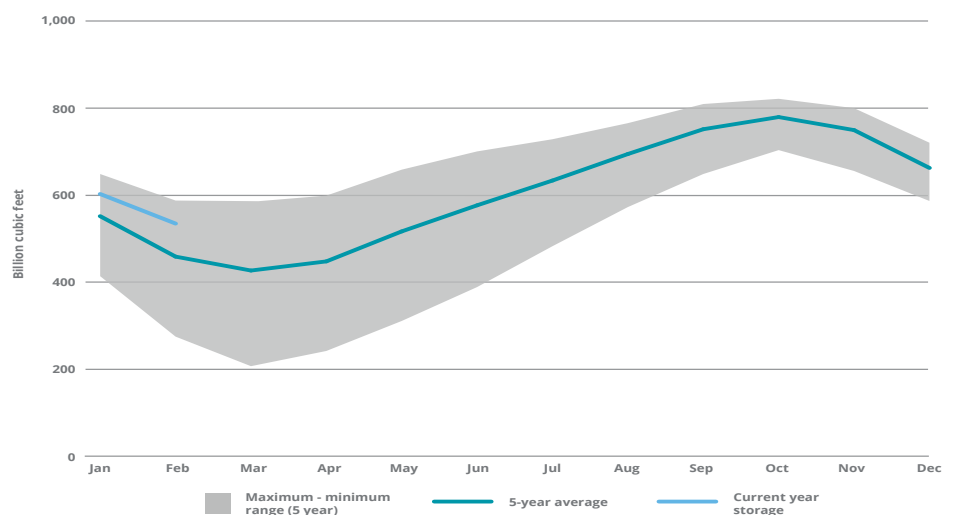
The United States natural gas storage levels have backed off from the five-year high but still are leading to a bearish outlook on natural gas in the market.

Canadian natural gas storage is also hovering just under the five year high, while 2016 saw the highest storage levels in the last five years overall.

United States

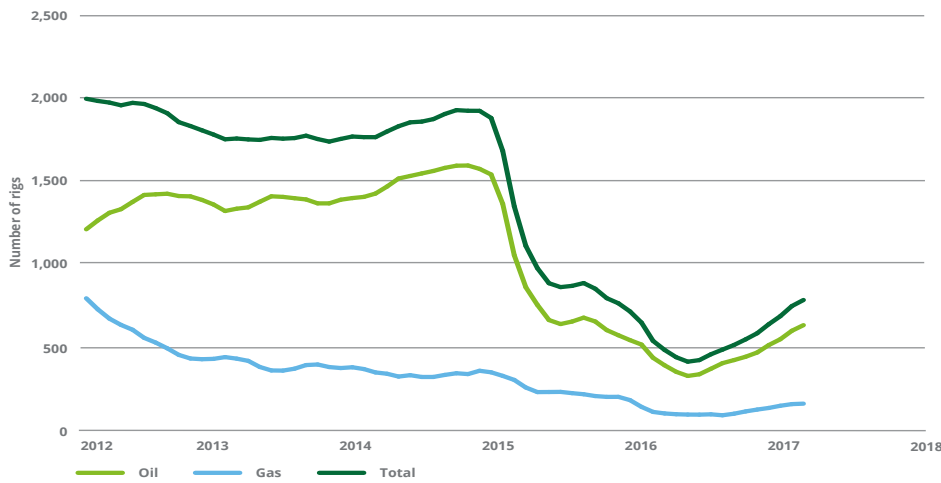


Canada

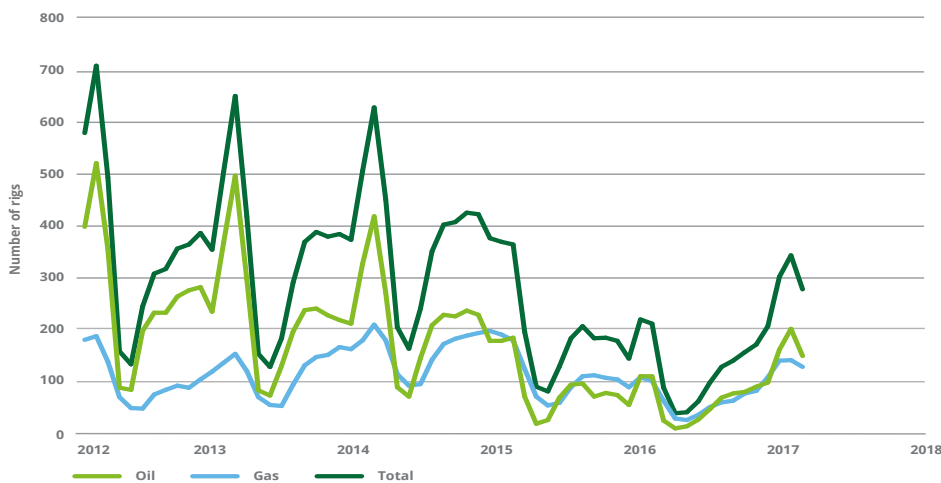


Source: Images adapted from US Energy Information Administration, Weekly Natural Gas Storage Report

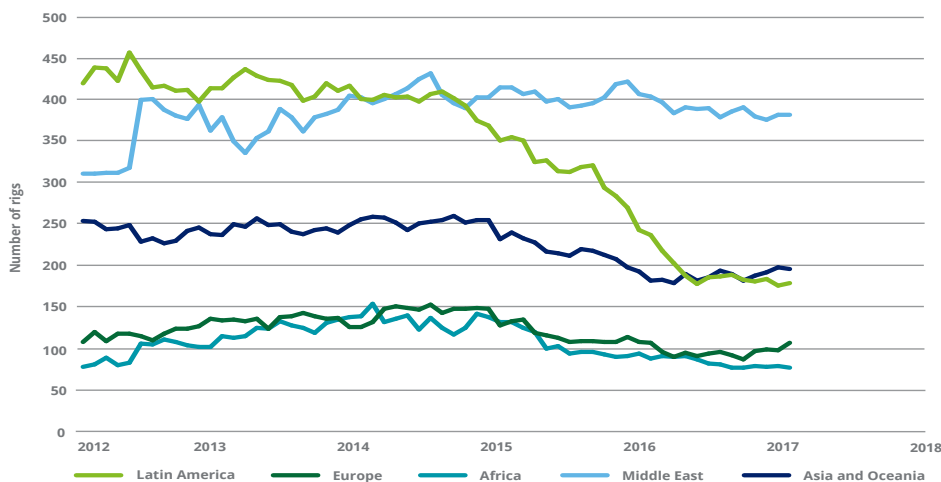
United States



Canada



International



Rigs

United States oil rig counts have been on a steady rise after hitting a low point in May 2016. The increase over the last several months has been due to significant increased drilling activity in the Permian Basin but also some increases in activity in the Eagleford. This quarter has seen a 25-percent increase in overall rigs from the previous quarter.

Canadian rigs were on a steep rise since May 2016 after hitting a low point. Oil rigs jumped significantly in February 2017 to reach 200, which represents a 100-percent increase from the average in December 2016.

Rig counts have levelled off or have been slightly declining in most regions of the world, but there has been a recent increase in activity in Asia and Europe. That said, the increases are small in nature, with four and eight rigs respectively, and are likely focused on specific projects. North America now makes up more than 50 per cent of the world's active rigs, which is still less than the historic norm of 60-70 per cent seen over the last 40 years.

Sources: Data adapted from Baker Hughes Incorporated, International Rig Count

Canadian domestic price tables

Year				Crude Oil pricing						
	Price Inflation	Cost Inflation	CAD to USD Exchange	WTI Cushing, OK (40° API)	WTI Cushing, OK (40° API)	Edmonton City Gate (40° API)	Edmonton City Gate (40° API)	WCS (20.5° API) Hardisty	Bow River (25° API) Hardisty	Heavy Oil Hardisty (12° API)
	Rate	Rate	Rate	US\$/bbl Real	US\$/bbl Current	C\$/bbl Real	C\$/bbl Current	C\$/bbl Current	C\$/bbl Current	C\$/bbl Current
Historical										
2007	0.023	0.023	0.952	\$79.02	\$75.40	\$82.85	\$79.06	\$53.78	\$54.70	\$41.00
2008	0.024	0.024	0.943	\$102.31	\$99.57	\$105.62	\$102.80	\$82.95	\$83.90	\$73.08
2009	0.003	0.003	0.880	\$62.95	\$61.65	\$67.49	\$66.10	\$58.66	\$59.80	\$54.40
2010	0.018	0.018	0.971	\$83.24	\$79.40	\$81.58	\$77.80	\$67.22	\$68.18	\$60.62
2011	0.029	0.029	1.012	\$99.24	\$94.88	\$99.92	\$95.54	\$77.12	\$78.42	\$69.60
2012	0.015	0.015	1.001	\$96.47	\$94.11	\$88.74	\$86.57	\$73.10	\$74.41	\$64.07
2013	0.009	0.009	0.972	\$100.76	\$97.91	\$96.08	\$93.36	\$74.97	\$76.29	\$65.49
2014	0.019	0.019	0.906	\$96.15	\$93.26	\$96.91	\$94.00	\$81.06	\$81.49	\$73.70
2015	0.011	0.011	0.783	\$49.96	\$48.69	\$58.49	\$57.00	\$44.80	\$45.23	\$39.63
2016	0.014	0.014	0.755	\$43.79	\$43.15	\$52.98	\$52.22	\$38.90	\$39.23	\$34.08
2017										
3 Months H	0.020	0.020	0.755	\$51.66	\$51.66	\$64.32	\$64.32	\$49.14	\$49.47	\$43.41
9 Months F	0.000	0.000	0.740	\$52.00	\$52.00	\$64.85	\$64.85	\$49.85	\$50.85	\$44.85
Avg.	-	-	0.744	\$51.91	\$51.91	\$64.72	\$64.72	\$49.67	\$50.50	\$44.49
Forecast										
2017	0.000	0.000	0.740	\$52.00	\$52.00	\$64.85	\$64.85	\$49.85	\$50.85	\$44.85
2018	0.020	0.020	0.760	\$54.00	\$55.10	\$65.80	\$67.10	\$51.80	\$52.85	\$46.70
2019	0.020	0.020	0.780	\$57.00	\$59.30	\$67.95	\$70.70	\$55.10	\$56.15	\$49.90
2020	0.020	0.020	0.810	\$60.00	\$63.65	\$69.15	\$73.40	\$57.45	\$58.55	\$52.15
2021	0.020	0.020	0.850	\$65.00	\$70.35	\$71.75	\$77.65	\$61.45	\$62.50	\$56.00
2022	0.020	0.020	0.850	\$70.00	\$77.30	\$77.65	\$85.75	\$69.15	\$70.25	\$63.65
2023	0.020	0.020	0.850	\$70.00	\$78.85	\$77.65	\$87.45	\$70.55	\$71.70	\$64.90
2024	0.020	0.020	0.850	\$70.00	\$80.40	\$77.65	\$89.20	\$71.95	\$73.10	\$66.20
2025	0.020	0.020	0.850	\$70.00	\$82.00	\$77.65	\$91.00	\$73.40	\$74.60	\$67.55
2026	0.020	0.020	0.850	\$70.00	\$83.65	\$77.65	\$92.80	\$74.85	\$76.05	\$68.90
2027	0.020	0.020	0.850	\$70.00	\$85.35	\$77.65	\$94.65	\$76.35	\$77.60	\$70.30
2028	0.020	0.020	0.850	\$70.00	\$87.05	\$77.65	\$96.55	\$77.90	\$79.15	\$71.70
2029	0.020	0.020	0.850	\$70.00	\$88.80	\$77.65	\$98.50	\$79.45	\$80.70	\$73.10
2030	0.020	0.020	0.850	\$70.00	\$90.55	\$77.65	\$100.45	\$81.05	\$82.35	\$74.60
2031	0.020	0.020	0.850	\$70.00	\$92.35	\$77.65	\$102.45	\$82.65	\$84.00	\$76.05
2032	0.020	0.020	0.850	\$70.00	\$94.20	\$77.65	\$104.50	\$84.30	\$85.65	\$77.60
2033	0.020	0.020	0.850	\$70.00	\$96.10	\$77.65	\$106.60	\$86.00	\$87.40	\$79.15
2034	0.020	0.020	0.850	\$70.00	\$98.00	\$77.65	\$108.75	\$87.75	\$89.15	\$80.70
2035	0.020	0.020	0.850	\$70.00	\$100.00	\$77.65	\$110.90	\$89.50	\$90.90	\$82.35
2036	0.020	0.020	0.850	\$70.00	\$102.00	\$77.65	\$113.10	\$91.25	\$92.75	\$84.00
2036+	0.020	0.020	0.850	0.00%	2.00%	0.00%	2.00%	2.00%	2.00%	2.00%

Notes

- All prices are in Canadian dollars except WTI and NYMEX gas which are in U.S. 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 2016 dollars with no escalation considered

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Year	Natural Gas Liquids pricing Edmonton Par prices				Natural Gas pricing						Sulphur	
	Ethane	Propane	Butane	Pentanes + Condensate	AB Ref. Avg. Price	AB AECO Avg. Price	AB AECO Avg. Price	B. C. Direct Station 2 Sales	NYMEX Henry Hub	NYMEX Henry Hub	Alberta Plant	Gate
	C\$/bbl	C\$/bbl	C\$/bbl	C\$/bbl	C\$/mcf	C\$/mcf	C\$/mcf	C\$/mcf	US\$/Mcf	US\$/Mcf		C\$/t
	Current	Current	Current	Current	Current	Real	Current	Current	Real	Current		Current
Historical												
2007	\$18.14	\$50.77	\$61.45	\$83.89	\$6.06	\$6.55	\$6.25	\$6.29	\$7.25	\$6.92		\$43.10
2008	\$22.59	\$56.96	\$83.54	\$109.77	\$7.88	\$8.38	\$8.16	\$8.20	\$9.11	\$8.86		\$303.83
2009	\$11.61	\$34.62	\$56.21	\$69.49	\$3.85	\$4.04	\$3.96	\$4.17	\$4.03	\$3.95		(\$5.08)
2010	\$11.53	\$45.19	\$68.79	\$84.02	\$3.76	\$4.20	\$4.01	\$4.01	\$4.60	\$4.39		\$56.94
2011	\$10.30	\$52.41	\$86.98	\$105.24	\$3.46	\$3.80	\$3.63	\$3.34	\$4.18	\$4.00		\$101.60
2012	\$6.73	\$30.80	\$75.47	\$99.67	\$2.25	\$2.45	\$2.39	\$2.29	\$2.82	\$2.75		\$126.81
2013	\$8.68	\$38.54	\$77.44	\$103.52	\$2.98	\$3.27	\$3.17	\$3.11	\$3.84	\$3.73		\$62.17
2014	\$12.46	\$42.93	\$59.43	\$101.47	\$4.22	\$4.64	\$4.50	\$4.16	\$4.53	\$4.39		\$88.99
2015	\$7.49	\$5.35	\$33.70	\$55.15	\$2.56	\$2.76	\$2.69	\$1.81	\$2.70	\$2.63		\$107.45
2016	\$6.04	\$8.71	\$31.45	\$52.43	\$1.93	\$2.19	\$2.16	\$1.75	\$2.55	\$2.52		\$45.40
2017												
12 Months H	\$7.46	\$28.08	\$43.11	\$64.00	\$2.38	\$2.68	\$2.68	\$2.49	\$2.96	\$2.96		\$49.13
0 Months F	\$7.15	\$25.95	\$38.90	\$64.85	\$2.25	\$2.55	\$2.55	\$2.15	\$3.20	\$3.20		\$50.00
Avg.	\$7.23	\$26.48	\$39.95	\$64.64	\$2.28	\$2.58	\$2.58	\$2.24	\$3.14	\$3.14		\$49.78
Forecast												
2017	\$7.15	\$25.95	\$38.90	\$64.85	\$2.25	\$2.55	\$2.55	\$2.15	\$3.20	\$3.20		\$50.00
2018	\$7.85	\$26.85	\$40.30	\$67.10	\$2.60	\$2.75	\$2.80	\$2.40	\$3.25	\$3.30		\$51.00
2019	\$8.45	\$28.30	\$42.40	\$70.70	\$2.80	\$3.00	\$3.10	\$2.60	\$3.30	\$3.45		\$52.00
2020	\$8.90	\$29.35	\$44.05	\$73.40	\$2.95	\$3.00	\$3.40	\$2.75	\$3.35	\$3.55		\$53.05
2021	\$9.40	\$31.05	\$46.60	\$77.65	\$3.15	\$3.10	\$3.35	\$2.90	\$3.40	\$3.70		\$54.10
2022	\$10.05	\$34.30	\$51.45	\$85.75	\$3.35	\$3.25	\$3.60	\$3.15	\$3.50	\$3.85		\$55.20
2023	\$10.70	\$34.95	\$52.50	\$87.45	\$3.60	\$3.40	\$3.85	\$3.40	\$3.65	\$4.10		\$56.30
2024	\$11.70	\$35.65	\$53.55	\$89.20	\$3.95	\$3.65	\$4.20	\$3.75	\$3.85	\$4.40		\$57.45
2025	\$12.50	\$36.40	\$54.60	\$91.00	\$4.20	\$3.80	\$4.45	\$4.00	\$4.00	\$4.70		\$58.60
2026	\$13.05	\$37.10	\$55.70	\$92.80	\$4.40	\$3.90	\$4.65	\$4.20	\$4.05	\$4.85		\$59.75
2027	\$13.45	\$37.85	\$56.80	\$94.65	\$4.55	\$3.95	\$4.80	\$4.35	\$4.10	\$5.00		\$60.95
2028	\$13.75	\$38.60	\$57.95	\$96.55	\$4.65	\$3.95	\$4.90	\$4.40	\$4.10	\$5.10		\$62.15
2029	\$14.00	\$39.40	\$59.10	\$98.50	\$4.75	\$3.95	\$5.00	\$4.50	\$4.10	\$5.20		\$63.40
2030	\$14.30	\$40.15	\$60.30	\$100.45	\$4.85	\$3.95	\$5.10	\$4.60	\$4.10	\$5.30		\$64.70
2031	\$14.60	\$40.95	\$61.50	\$102.45	\$4.95	\$3.95	\$5.20	\$4.70	\$4.10	\$5.40		\$65.95
2032	\$14.85	\$41.80	\$62.70	\$104.50	\$5.05	\$3.95	\$5.30	\$4.80	\$4.10	\$5.50		\$67.30
2033	\$15.15	\$42.60	\$63.95	\$106.60	\$5.15	\$3.95	\$5.40	\$4.85	\$4.10	\$5.65		\$68.65
2034	\$15.45	\$43.50	\$65.25	\$108.75	\$5.25	\$3.95	\$5.55	\$4.95	\$4.10	\$5.75		\$70.00
2035	\$15.80	\$44.35	\$66.55	\$110.90	\$5.35	\$3.95	\$5.65	\$5.05	\$4.10	\$5.85		\$71.40
2036	\$16.10	\$45.25	\$67.90	\$113.10	\$5.45	\$3.95	\$5.75	\$5.15	\$4.10	\$5.95		\$72.85
2036+	2.00%	2.00%	2.00%	2.00%	2.00%	0.00%	2.00%	2.00%	0.00%	2.00%		2.00%

Notes

- All prices are in Canadian dollars except WTI and NYMEX gas which are in U.S. 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 2016 dollars with no escalation considered
- Alberta gas prices, except AECO, include an average cost of service to the plant gate

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Additional crude reference prices

Year	Crude Oil pricing			Natural Gas
	Lt. Sour (35° API) Cromer, SK	MSO (31° API) Hardisty	Synbit (AWB) 70% Bitumen 30% Cond. (21° API)	Ontario Dawn Ref. Point
	C\$/bbl	C\$/bbl	C\$/bbl	C\$/mcf
	Current	Current	Current	Current
Historical				
2007	\$72.10	\$66.36	\$53.87	\$7.35
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				
3 Months H	\$62.11	\$60.54	\$49.59	\$4.24
9 Months F	\$63.35	\$60.85	\$50.85	\$4.55
Avg.	\$63.04	\$60.77	\$50.53	\$4.47
Forecast				
2017	\$63.35	\$60.85	\$50.85	\$4.55
2018	\$65.60	\$63.05	\$52.85	\$4.65
2019	\$69.15	\$66.55	\$56.15	\$4.70
2020	\$71.80	\$69.15	\$58.55	\$4.65
2021	\$76.05	\$73.35	\$62.50	\$4.60
2022	\$84.10	\$81.30	\$70.25	\$4.80
2023	\$85.75	\$82.95	\$71.70	\$5.10
2024	\$87.45	\$84.60	\$73.10	\$5.50
2025	\$89.20	\$86.30	\$74.60	\$5.80
2026	\$91.00	\$88.00	\$76.05	\$6.00
2027	\$92.85	\$89.80	\$77.60	\$6.15
2028	\$94.70	\$91.55	\$79.15	\$6.30
2029	\$96.60	\$93.40	\$80.70	\$6.40
2030	\$98.50	\$95.25	\$82.35	\$6.55
2031	\$100.50	\$97.20	\$84.00	\$6.65
2032	\$102.50	\$99.10	\$85.65	\$6.80
2033	\$104.55	\$101.10	\$87.40	\$6.95
2034	\$106.65	\$103.15	\$89.15	\$7.05
2035	\$108.75	\$105.20	\$90.90	\$7.20
2036	\$110.95	\$107.30	\$92.75	\$7.35
2036+	2.00%	2.00%	2.00%	2.00%

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)
- 1 Mcf is equivalent to 1 mmbtu
- Real prices listed in 2016 dollars with no escalation considered
- Sarnia price is Edmonton Sweet (MSW) delivered to Sarnia, Ontario
- Synbit is a combined bitumin (70%) and Condensate (30%) stream equivalent to the Acces Western Blend (AWB)

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International price tables

Year	Crude Oil pricing															
	Avg. WTI Spot	Alaskan North Slope	California Kern River	Louisiana Heavy Sweet	Louisiana Light Sweet	MARS Blend	Wyoming Sweet	Brent Spot	Gulf Coast ASC	Avg. OPEC Basket	Venezuelan Merey	Nigerian Bonny Light	Arabia UAE Dubai Fetch	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																
2017	\$52.00	\$44.00	\$46.50	\$49.50	\$50.00	\$45.50	\$47.75	\$53.00	\$45.50	\$51.00	\$45.00	\$53.40	\$51.00	\$45.50	\$51.50	\$49.00
2018	\$54.00	\$46.00	\$48.50	\$51.50	\$52.00	\$47.50	\$49.75	\$55.00	\$47.50	\$53.00	\$47.00	\$55.40	\$53.00	\$47.50	\$53.50	\$51.00
2019	\$57.00	\$49.00	\$51.50	\$54.50	\$55.00	\$50.50	\$52.75	\$58.00	\$50.50	\$56.00	\$50.00	\$58.40	\$56.00	\$50.50	\$56.50	\$54.00
2020	\$60.00	\$52.00	\$54.50	\$57.50	\$58.00	\$53.50	\$55.75	\$61.00	\$53.50	\$59.00	\$53.00	\$61.40	\$59.00	\$53.50	\$59.50	\$57.00
2021	\$65.00	\$57.00	\$59.50	\$62.50	\$63.00	\$58.50	\$60.75	\$66.00	\$58.50	\$64.00	\$58.00	\$66.40	\$64.00	\$58.50	\$64.50	\$62.00
2022	\$70.00	\$62.00	\$64.50	\$67.50	\$68.00	\$63.50	\$65.75	\$71.00	\$63.50	\$69.00	\$63.00	\$71.40	\$69.00	\$63.50	\$69.50	\$67.00
2023	\$70.00	\$62.00	\$64.50	\$67.50	\$68.00	\$63.50	\$65.75	\$71.00	\$63.50	\$69.00	\$63.00	\$71.40	\$69.00	\$63.50	\$69.50	\$67.00
2024	\$70.00	\$62.00	\$64.50	\$67.50	\$68.00	\$63.50	\$65.75	\$71.00	\$63.50	\$69.00	\$63.00	\$71.40	\$69.00	\$63.50	\$69.50	\$67.00
2025	\$70.00	\$62.00	\$64.50	\$67.50	\$68.00	\$63.50	\$65.75	\$71.00	\$63.50	\$69.00	\$63.00	\$71.40	\$69.00	\$63.50	\$69.50	\$67.00
2026	\$70.00	\$62.00	\$64.50	\$67.50	\$68.00	\$63.50	\$65.75	\$71.00	\$63.50	\$69.00	\$63.00	\$71.40	\$69.00	\$63.50	\$69.50	\$67.00
2027	\$70.00	\$62.00	\$64.50	\$67.50	\$68.00	\$63.50	\$65.75	\$71.00	\$63.50	\$69.00	\$63.00	\$71.40	\$69.00	\$63.50	\$69.50	\$67.00
2028	\$70.00	\$62.00	\$64.50	\$67.50	\$68.00	\$63.50	\$65.75	\$71.00	\$63.50	\$69.00	\$63.00	\$71.40	\$69.00	\$63.50	\$69.50	\$67.00
2029	\$70.00	\$62.00	\$64.50	\$67.50	\$68.00	\$63.50	\$65.75	\$71.00	\$63.50	\$69.00	\$63.00	\$71.40	\$69.00	\$63.50	\$69.50	\$67.00
2030	\$70.00	\$62.00	\$64.50	\$67.50	\$68.00	\$63.50	\$65.75	\$71.00	\$63.50	\$69.00	\$63.00	\$71.40	\$69.00	\$63.50	\$69.50	\$67.00
2031	\$70.00	\$62.00	\$64.50	\$67.50	\$68.00	\$63.50	\$65.75	\$71.00	\$63.50	\$69.00	\$63.00	\$71.40	\$69.00	\$63.50	\$69.50	\$67.00
2032	\$70.00	\$62.00	\$64.50	\$67.50	\$68.00	\$63.50	\$65.75	\$71.00	\$63.50	\$69.00	\$63.00	\$71.40	\$69.00	\$63.50	\$69.50	\$67.00
2033	\$70.00	\$62.00	\$64.50	\$67.50	\$68.00	\$63.50	\$65.75	\$71.00	\$63.50	\$69.00	\$63.00	\$71.40	\$69.00	\$63.50	\$69.50	\$67.00
2034	\$70.00	\$62.00	\$64.50	\$67.50	\$68.00	\$63.50	\$65.75	\$71.00	\$63.50	\$69.00	\$63.00	\$71.40	\$69.00	\$63.50	\$69.50	\$67.00
2035	\$70.00	\$62.00	\$64.50	\$67.50	\$68.00	\$63.50	\$65.75	\$71.00	\$63.50	\$69.00	\$63.00	\$71.40	\$69.00	\$63.50	\$69.50	\$67.00
2036	\$70.00	\$62.00	\$64.50	\$67.50	\$68.00	\$63.50	\$65.75	\$71.00	\$63.50	\$69.00	\$63.00	\$71.40	\$69.00	\$63.50	\$69.50	\$67.00
2036+	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Notes

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

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Year			Natural Gas pricing						Ethanol
	USD to GBP Exchange	USD to EUR Exchange	NYMEX Henry Hub	Permian Waha	San Juan Ignacio	Rocky Mtn. Opal	UK NBP	India Domestic Gas	US CBOT Ethanol
	Rate	Rate	US\$/Mcf Real	US\$/Mcf Real	US\$/Mcf Real	US\$/Mcf Real	US\$/gal. Real	US\$/bbl Real	US\$/bbl Real
Forecast									
2017	1.250	1.050	\$3.20	\$2.95	\$2.95	\$2.70	\$5.30	\$2.45	\$1.50
2018	1.250	1.050	\$3.25	\$3.00	\$3.00	\$3.05	\$5.35	\$3.15	\$1.50
2019	1.250	1.050	\$3.30	\$3.05	\$3.05	\$3.10	\$5.40	\$3.20	\$1.50
2020	1.250	1.050	\$3.35	\$3.10	\$3.10	\$3.15	\$5.45	\$3.25	\$1.50
2021	1.250	1.050	\$3.40	\$3.15	\$3.15	\$3.20	\$5.50	\$3.30	\$1.50
2022	1.250	1.050	\$3.50	\$3.25	\$3.25	\$3.25	\$5.60	\$3.35	\$1.50
2023	1.250	1.050	\$3.65	\$3.40	\$3.40	\$3.35	\$5.75	\$3.45	\$1.50
2024	1.250	1.050	\$3.85	\$3.60	\$3.60	\$3.50	\$5.90	\$3.60	\$1.50
2025	1.250	1.050	\$4.00	\$3.75	\$3.75	\$3.70	\$6.00	\$3.75	\$1.50
2026	1.250	1.050	\$4.05	\$3.80	\$3.80	\$3.85	\$6.05	\$3.85	\$1.50
2027	1.250	1.050	\$4.10	\$3.85	\$3.85	\$3.90	\$6.10	\$3.90	\$1.50
2028	1.250	1.050	\$4.10	\$3.85	\$3.85	\$3.95	\$6.10	\$3.95	\$1.50
2029	1.250	1.050	\$4.10	\$3.85	\$3.85	\$3.95	\$6.10	\$3.95	\$1.50
2030	1.250	1.050	\$4.10	\$3.85	\$3.85	\$3.95	\$6.10	\$3.95	\$1.50
2031	1.250	1.050	\$4.10	\$3.85	\$3.85	\$3.95	\$6.10	\$3.95	\$1.50
2032	1.250	1.050	\$4.10	\$3.85	\$3.85	\$3.95	\$6.10	\$3.95	\$1.50
2033	1.250	1.050	\$4.10	\$3.85	\$3.85	\$3.95	\$6.10	\$3.95	\$1.50
2034	1.250	1.050	\$4.10	\$3.85	\$3.85	\$3.95	\$6.10	\$3.95	\$1.50
2035	1.250	1.050	\$4.10	\$3.85	\$3.85	\$3.95	\$6.10	\$3.95	\$1.50
2036	1.250	1.050	\$4.10	\$3.85	\$3.85	\$3.95	\$6.10	\$3.95	\$1.50
2036+	1.250	1.050	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

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

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