



## Price Forecast

June 30, 2016

Resource Evaluation & Advisory



# Forecast commentary

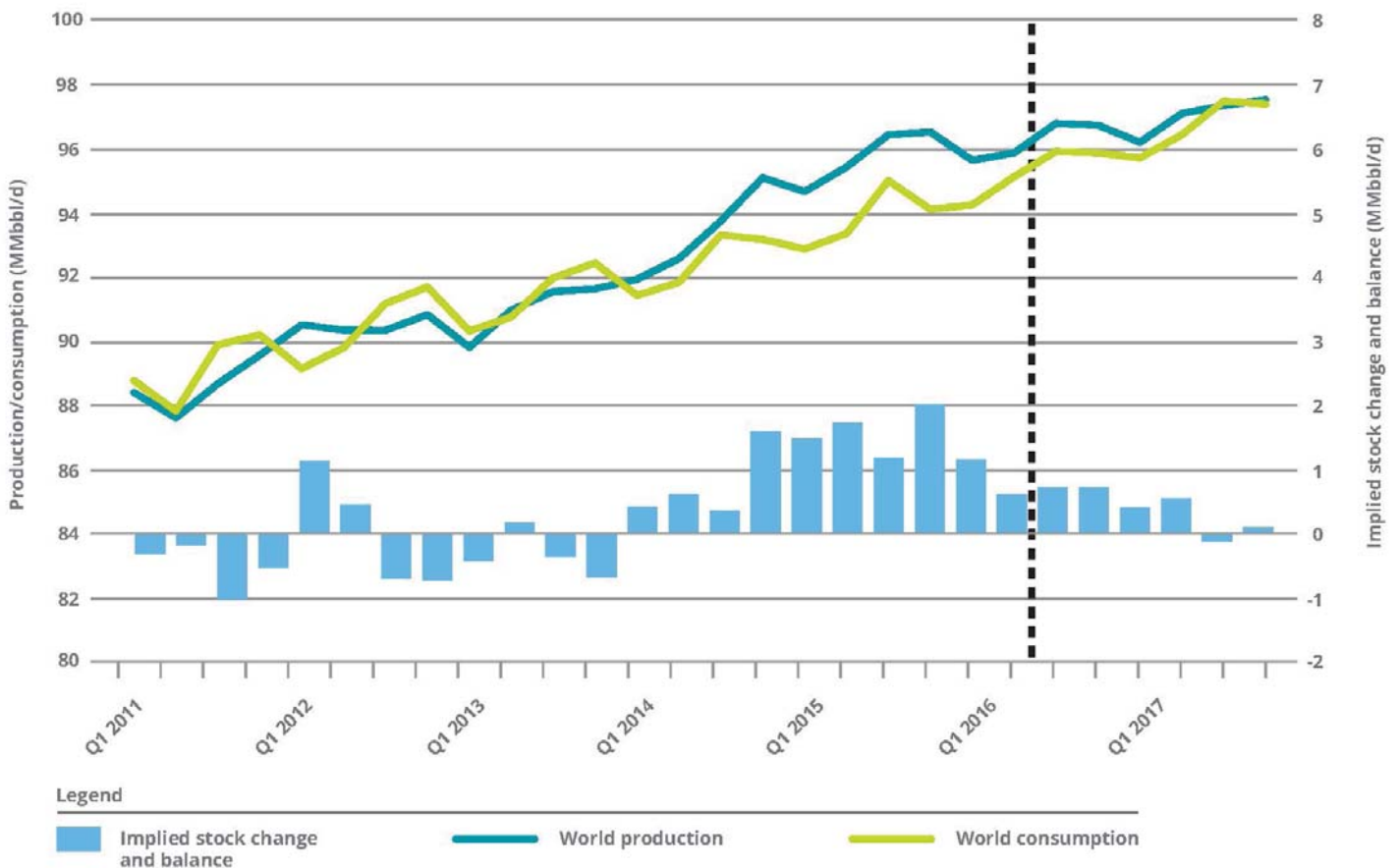
“Life is like riding a bicycle. To keep your balance, you must keep moving”

**Albert Einstein**

With oil recently flirting with the \$50/bbl mark, sentiment has begun to shift slightly in the oil market. There is now cautious optimism that the oversupply in the market is close to being balanced as demand continues to remain strong and drilling activity continues to decline. US crude oil stocks have also begun the withdrawal

period after reaching a multi-year high in May 2016. With the Energy Information Administration (EIA) estimating the current oversupply to be approximately 750 Mbb/d (as of June 2016), we expect oil prices to strengthen over the next few quarters as crude production continues to flatten.

**Figure 1: EIA world liquid fuel production and consumption history and forecast**



Source: Data adapted from US Energy Information Administration (EIA)

Contributing to the decline in production are the recent wildfires in Northern Alberta, causing oil sands operations to scale down or come to a halt. This resulted in production outages of between 1 million and 1.5 million barrels per day, which represents more than 25 per cent of Alberta's oil production. This was significant enough to temporarily bring world supply below consumption levels. The result of this shifting balance could be observed in the price of WTI, which increased steadily through May before tapering off in June as some of the shut-in production was restored.

With the majority of the interrupted production being sold at the Western Canadian Select (WCS) benchmark, we anticipate the price to rise due to the

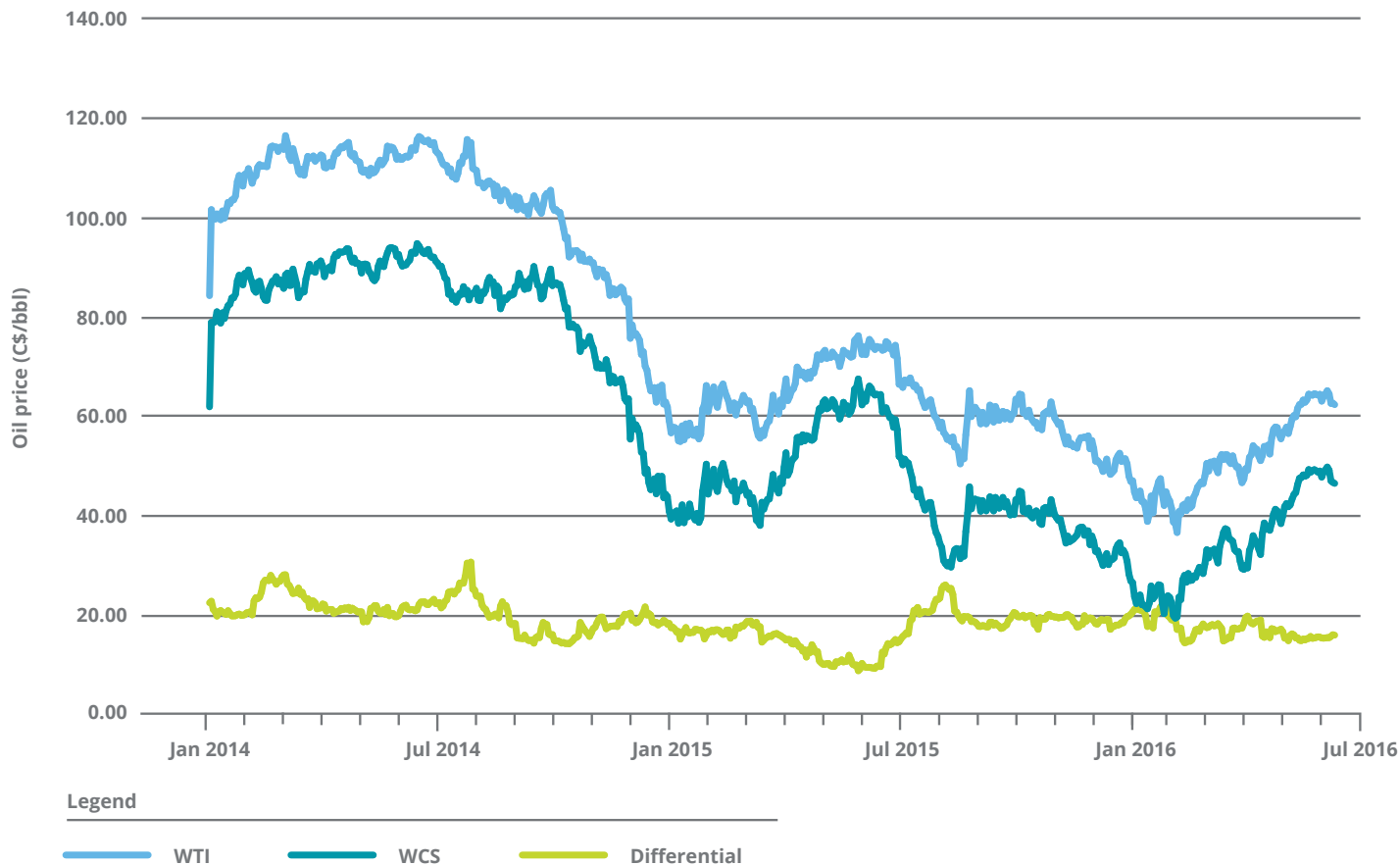
reduced supply. This was demonstrated in the slight narrowing of the WTI/WCS differential, which dropped by 10 per cent between April and May. However, this disparity is expected to be short-lived as oil sands operations restart and production comes back online. A similar phenomenon was seen in 2015, when wildfires caused the shutdown of facilities producing approximately 150 Mbb/d. The decrease in the differential was even more significant then, dropping by almost 30 per cent, suggesting that the 2016 outages have had more of a global effect, causing WTI to rise along with WCS.

Our forecast anticipates a slight increase in oil prices for the remainder of 2016, with an expected average price of USD \$50/bbl for WTI, USD \$51/bbl for Brent, CAD

\$60/bbl for Edmonton Light and CAD \$47/bbl for WCS. As prices increase, it is expected that many producers will direct this additional revenue to debt repayment and maintaining dividends, which will reduce the level of capital investment and, in turn, slow future production growth. As such, we foresee medium-term growth in prices as demand eventually outpaces supply.

Recent volatility seen in the markets due to the United Kingdom voting to leave the European Union has not materially changed our view of the supply/demand dynamics of world oil. Some believe that this decision could lead to a slow-down in the British economy but our belief at this point in time is that there are more material pressures on oil than this potential slow down.

Figure 2: WTI (C\$/bbl) and WCS (C\$/bbl) Differential



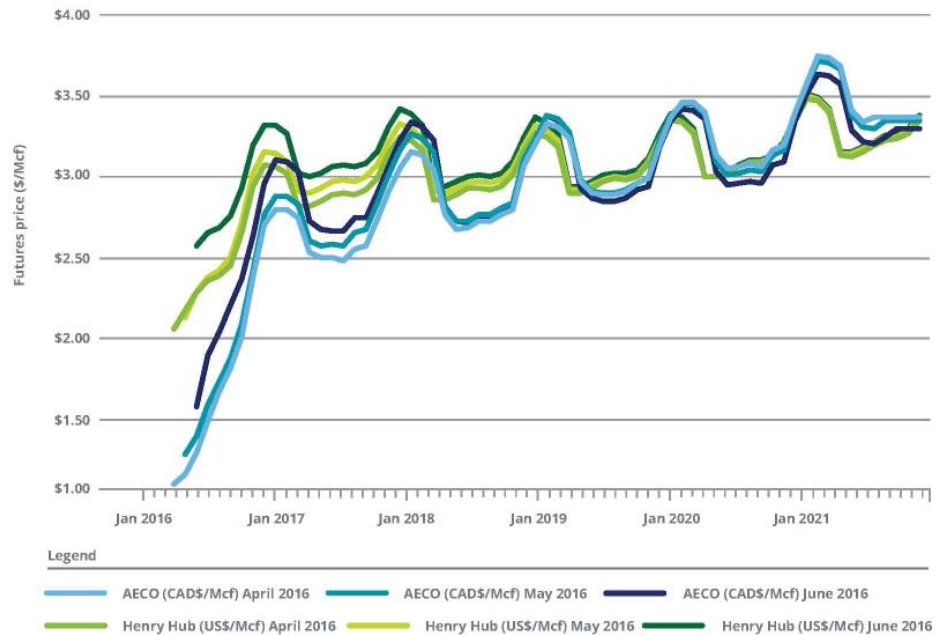
Source: Data adapted from FirstEnergy Corporation

Gas prices in Alberta over the last quarter have improved by about \$0.50/Mcf, which is significant considering that the March price for AECO was hovering around \$1.00/Mcf. However, we are not expecting the growth in gas prices to continue as strongly, in contrast to what the market is saying these days. The current forward strip has significant growth in the near term, with prices in 2017 growing to \$3.00/Mcf for AECO. A similar story exists for the Henry Hub futures, with the futures growing from \$2.50/Mcf USD to \$3.25/Mcf USD over the next eight months.

Natural gas storage is still at a five-year high, at approximately 650 Bcf, and the trend going into the summer is for heating and cooling days at or below the five-year minimum. The implication is that the forward curve may be optimistic, and producers could take advantage of this by hedging now in anticipation of reality not being as rosy as anticipated.

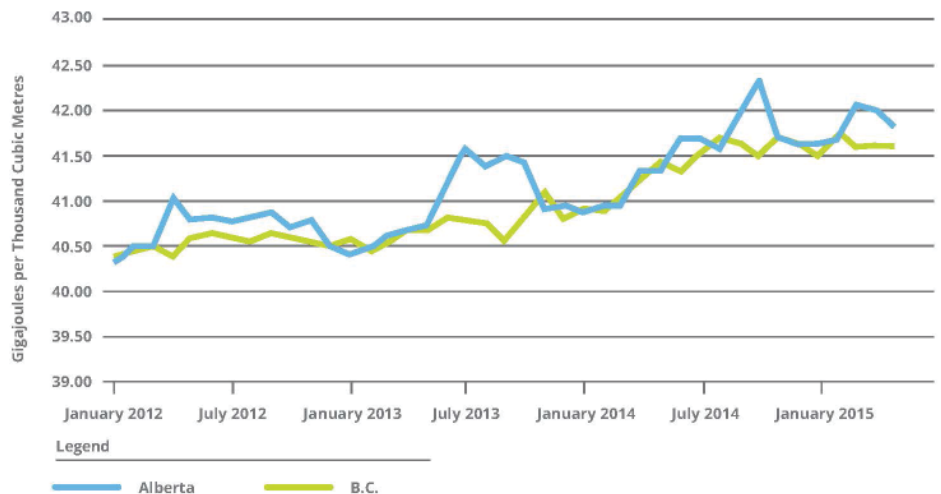
Various strategies have been employed to deal with the exposure that gas producers have with the low prices. Some companies focus on hedging to create predictability, but others are purchasing firm contracts on specific pipelines. One pipeline of particular interest is the Alliance pipeline that carries about 1.6 Bcf/d of gas to Chicago and has receipt points in Alberta and British Columbia. Its unique aspect is that it can carry gas with a higher liquids content than most other pipelines in Western Canada, meaning companies do not have to strip out as significant a portion of their liquids prior to entering the system. This can be beneficial for producers in two ways: the market the natural gas is being sold into is not as depressed as AECO and Station 2, and the liquids can be stripped out at the sales point (through the Aux Sable plant) and sold into a higher-price environment. The drawback is that the cost of transportation is increased. This strategy is along the same lines as hedging since it is betting on the market to continue to be stronger in the Midwest than in Alberta to offset those increased transportation costs. The use of the Alliance pipeline for increasingly rich gas has been a trend over the past few years, as shown in Figure 4.

**Figure 3: Combined futures**



Source: Data adapted from NGX

**Figure 4: Heat content of the Alliance Pipeline's receipts in Alberta and B.C.**



Source: Image adapted from National Energy Board (NEB)

The heat content of the Alliance Pipeline has risen from an average of 40.5 GJ/Mcf to now averaging above 41.50 GJ/Mcf. This demonstrates that companies are opting to not have to sell their natural gas liquids in the Alberta market, but to the United States instead. This is particularly impactful for propane volumes, which were a liability for producers for a period in 2015.

Our price forecast expects an average AECO price for 2016 of \$2.10/Mcf CAD, and an average Henry Hub price of \$2.60/Mcf USD. We are not anticipating the strong growth shown in the futures curve but rather a steady shallow incline for the next several years.

# Canadian domestic price forecast

## Crude oil price and market demand forecast



## 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
<b>Historical</b>								
2013	\$101.91	\$97.91	\$97.17	\$93.36	\$74.97	\$65.49	0.009	0.972
2014	\$96.15	\$93.26	\$96.91	\$94.00	\$81.06	\$73.70	0.019	0.906
2015	\$49.24	\$48.69	\$57.65	\$57.00	\$44.80	\$39.63	0.011	0.783
<b>2016</b>								
6 Months H	\$39.36	\$39.36	\$46.73	\$46.73	\$33.79	\$28.63	0.017	0.752
6 Months F	\$50.00	\$50.00	\$59.75	\$59.75	\$46.75	\$40.75	0.000	0.770
Avg.	\$44.68	\$44.68	\$53.24	\$53.24	\$40.27	\$34.69	-	0.761
<b>Forecast</b>								
2016	\$50.00	\$50.00	\$59.75	\$59.75	\$46.75	\$40.75	0.000	0.770
2017	\$53.00	\$54.05	\$61.25	\$62.50	\$49.20	\$43.10	0.020	0.800
2018	\$57.00	\$59.30	\$64.65	\$67.25	\$53.75	\$47.50	0.020	0.820
2019	\$61.00	\$64.75	\$67.85	\$72.00	\$58.20	\$51.85	0.020	0.840
2020	\$65.00	\$70.35	\$71.75	\$77.65	\$63.60	\$57.10	0.020	0.850
2021	\$69.00	\$76.20	\$76.45	\$84.40	\$70.05	\$63.45	0.020	0.850
2022	\$73.00	\$82.20	\$81.20	\$91.45	\$76.80	\$70.05	0.020	0.850
2023	\$75.00	\$86.15	\$83.55	\$95.95	\$81.05	\$74.15	0.020	0.850

## Natural gas price and market demand forecast



## 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.
- 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 Current	C\$/mcf Real	C\$/mcf Current	C\$/mcf Current	US\$/Mcf Real	US\$/Mcf Current
<b>Historical</b>						
2013	\$2.98	\$3.30	\$3.17	\$3.11	\$3.88	\$3.73
2014	\$4.22	\$4.64	\$4.50	\$4.16	\$4.53	\$4.39
2015	\$2.56	\$2.72	\$2.69	\$1.81	\$2.66	\$2.63
<b>2016</b>						
6 Months H	\$1.58	\$1.62	\$1.62	\$1.25	\$2.04	\$2.04
6 Months F	\$1.90	\$2.10	\$2.10	\$1.60	\$2.60	\$2.60
Avg.	\$1.74	\$1.86	\$1.86	\$1.42	\$2.32	\$2.32
<b>Forecast</b>						
2016	\$1.90	\$2.10	\$2.10	\$1.60	\$2.60	\$2.60
2017	\$2.50	\$2.65	\$2.70	\$2.20	\$2.85	\$2.90
2018	\$2.85	\$2.95	\$3.05	\$2.55	\$3.00	\$3.10
2019	\$2.95	\$3.00	\$3.20	\$2.65	\$3.10	\$3.30
2020	\$3.15	\$3.10	\$3.35	\$2.80	\$3.25	\$3.50
2021	\$3.30	\$3.20	\$3.55	\$3.00	\$3.30	\$3.65
2022	\$3.55	\$3.35	\$3.75	\$3.20	\$3.45	\$3.90
2023	\$3.85	\$3.55	\$4.10	\$3.50	\$3.60	\$4.15

# 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
<b>Forecast</b>							
2016	\$50.00	\$51.00	\$46.00	\$48.00	\$51.50	\$43.00	\$49.50
2017	\$53.00	\$54.00	\$49.00	\$51.00	\$54.50	\$46.00	\$52.50
2018	\$57.00	\$58.00	\$53.00	\$55.00	\$58.50	\$50.00	\$56.50
2019	\$61.00	\$62.00	\$57.00	\$59.00	\$62.50	\$54.00	\$60.50
2020	\$65.00	\$66.00	\$61.00	\$63.00	\$66.50	\$58.00	\$64.50
2021	\$69.00	\$70.00	\$65.00	\$67.00	\$70.50	\$62.00	\$68.50
2022	\$73.00	\$74.00	\$69.00	\$71.00	\$74.50	\$66.00	\$72.50
2023	\$75.00	\$76.00	\$71.00	\$73.00	\$76.50	\$68.00	\$74.50

### 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 percent 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	Gulf Coast (Onshore)	Louisiana East Texas	Rocky Mtn Opal	UK NBP
	Rate	Rate	US\$/Mcf Real	US\$/Mcf Real	US\$/Mcf Real	US\$/Mcf Real	US\$/Mcf Real	US\$/Mcf Real	US\$/Mcf Real
<b>Forecast</b>									
2016	1.470	1.100	\$2.60	\$2.45	\$2.45	\$2.50	\$2.55	\$2.50	\$5.10
2017	1.470	1.100	\$2.85	\$2.70	\$2.70	\$2.75	\$2.80	\$2.75	\$5.35
2018	1.470	1.100	\$3.00	\$2.85	\$2.85	\$2.90	\$2.95	\$2.90	\$5.50
2019	1.470	1.100	\$3.10	\$2.95	\$2.95	\$3.00	\$3.05	\$3.00	\$5.60
2020	1.470	1.100	\$3.25	\$3.10	\$3.10	\$3.15	\$3.20	\$3.15	\$5.75
2021	1.470	1.100	\$3.30	\$3.15	\$3.15	\$3.20	\$3.25	\$3.20	\$5.80
2022	1.470	1.100	\$3.45	\$3.30	\$3.30	\$3.35	\$3.40	\$3.35	\$5.95
2023	1.470	1.100	\$3.60	\$3.45	\$3.45	\$3.50	\$3.55	\$3.50	\$6.10

### 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.

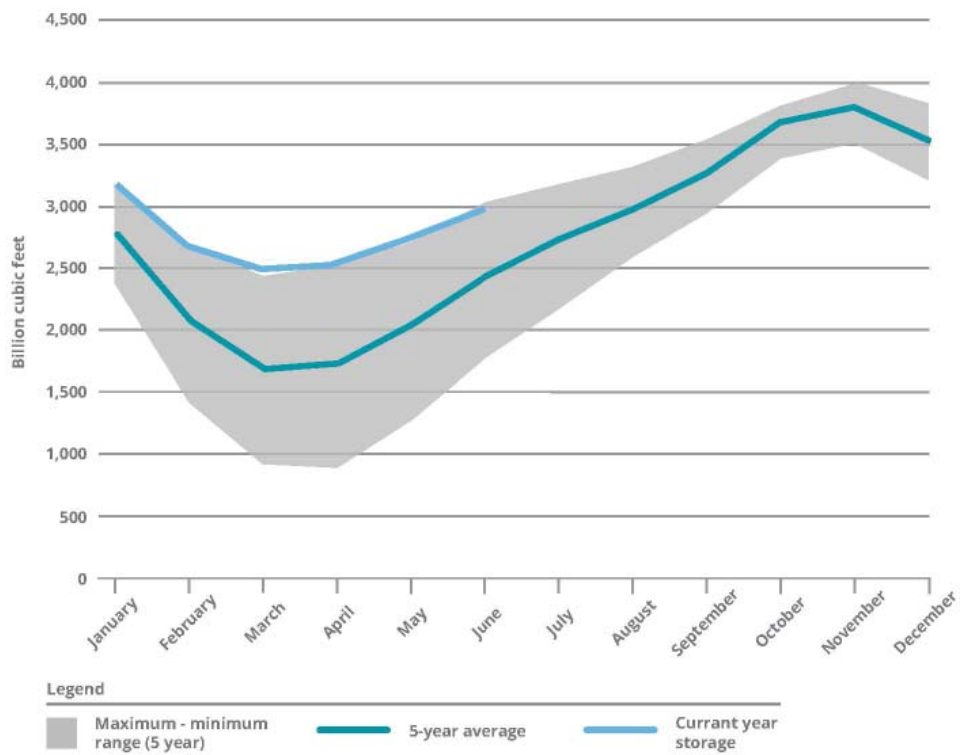


# Global trends

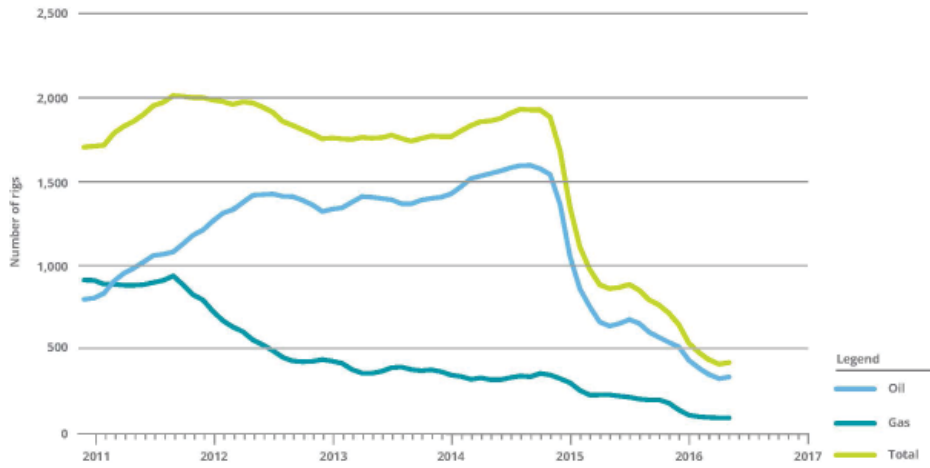
## Storage

The United States natural gas storage levels continue to remain above the five-year average. With continued warm weather expected in this El Nino year, a shift in storage levels are not expected.

### Natural Gas



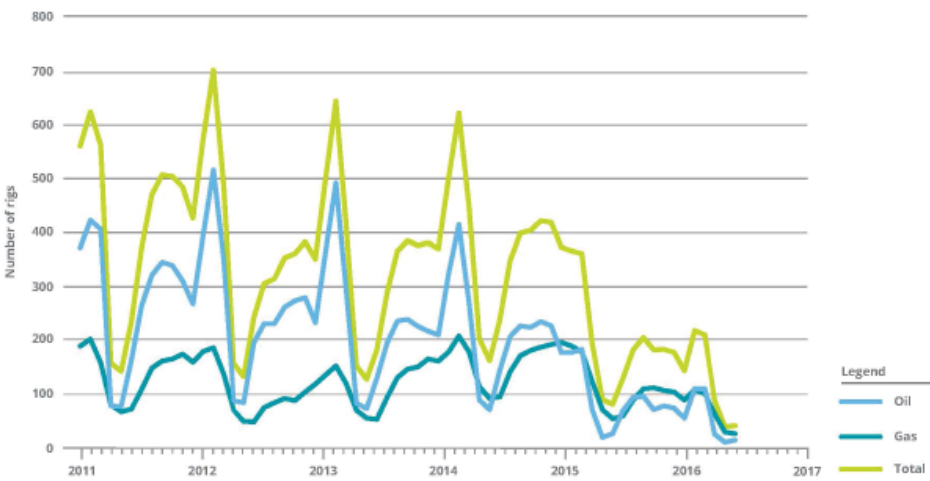
Source: Image adapted from US Energy Information Administration, Weekly Natural Gas Storage Report



## Rigs

### United States

United States oil rig counts have steadily dropped throughout 2016 but may be leveling off for the summer. Gas rig counts have also dropped significantly over the last six months as gas prices have weakened.



### Canada

Canadian rig counts continue to decline as companies cut capital budgets and reassess their strategies.



### International

Rig counts continue to drop in Latin America and Asia, while they have leveled off in Europe and Africa. Middle Eastern rig counts have remained fairly steady as OPEC countries continue to pump oil at historic highs. International rig counts have not dropped as dramatically as in North America, which now accounts for less than 35 percent of the world's active rigs. The last time North America contained less than half of the world's active rigs was in 1993.

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

# Canadian domestic forecast

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
<b>Historical</b>										
2006	0.017	0.017	0.887	\$78.12	\$66.02	\$86.98	\$73.51	\$52.74	\$53.61	\$41.89
2007	0.021	0.021	0.935	\$84.14	\$72.32	\$89.65	\$77.05	\$52.90	\$53.87	\$39.76
2008	0.024	0.024	0.943	\$113.37	\$99.57	\$117.04	\$102.80	\$82.95	\$83.90	\$73.08
2009	0.003	0.003	0.880	\$68.53	\$61.65	\$73.47	\$66.10	\$58.66	\$59.80	\$54.40
2010	0.018	0.018	0.971	\$87.98	\$79.40	\$86.22	\$77.80	\$67.22	\$68.18	\$60.62
2011	0.029	0.029	1.012	\$103.29	\$94.88	\$104.01	\$95.54	\$77.12	\$78.42	\$69.60
2012	0.015	0.015	1.001	\$99.46	\$94.11	\$91.50	\$86.57	\$73.10	\$74.41	\$64.07
2013	0.009	0.009	0.972	\$101.91	\$97.91	\$97.17	\$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	\$49.24	\$48.69	\$57.65	\$57.00	\$44.80	\$45.23	\$39.63
<b>2016</b>										
3 Months H	0.017	0.017	0.752	\$39.36	\$39.36	\$46.73	\$46.73	\$33.79	\$34.24	\$28.63
9 Months F	0.000	0.000	0.770	\$50.00	\$50.00	\$59.75	\$59.75	\$46.75	\$47.75	\$40.75
Avg.	-	-	0.761	\$44.68	\$44.68	\$53.24	\$53.24	\$40.27	\$40.99	\$34.69
<b>Forecast</b>										
2016	0.000	0.000	0.770	\$50.00	\$50.00	\$59.75	\$59.75	\$46.75	\$47.75	\$40.75
2017	0.020	0.020	0.800	\$53.00	\$54.05	\$61.25	\$62.50	\$49.20	\$50.25	\$43.10
2018	0.020	0.020	0.820	\$57.00	\$59.30	\$64.65	\$67.25	\$53.75	\$54.80	\$47.50
2019	0.020	0.020	0.840	\$61.00	\$64.75	\$67.85	\$72.00	\$58.20	\$59.25	\$51.85
2020	0.020	0.020	0.850	\$65.00	\$70.35	\$71.75	\$77.65	\$63.60	\$64.70	\$57.10
2021	0.020	0.020	0.850	\$69.00	\$76.20	\$76.45	\$84.40	\$70.05	\$71.15	\$63.45
2022	0.020	0.020	0.850	\$73.00	\$82.20	\$81.20	\$91.45	\$76.80	\$77.95	\$70.05
2023	0.020	0.020	0.850	\$75.00	\$86.15	\$83.55	\$95.95	\$81.05	\$82.20	\$74.15
2024	0.020	0.020	0.850	\$75.00	\$87.85	\$83.55	\$97.90	\$82.65	\$83.85	\$75.65
2025	0.020	0.020	0.850	\$75.00	\$89.65	\$83.55	\$99.85	\$84.30	\$85.50	\$77.15
2026	0.020	0.020	0.850	\$75.00	\$91.40	\$83.55	\$101.85	\$86.00	\$87.20	\$78.70
2027	0.020	0.020	0.850	\$75.00	\$93.25	\$83.55	\$103.90	\$87.70	\$88.95	\$80.25
2028	0.020	0.020	0.850	\$75.00	\$95.10	\$83.55	\$105.95	\$89.45	\$90.75	\$81.85
2029	0.020	0.020	0.850	\$75.00	\$97.00	\$83.55	\$108.10	\$91.25	\$92.55	\$83.50
2030	0.020	0.020	0.850	\$75.00	\$98.95	\$83.55	\$110.25	\$93.10	\$94.40	\$85.15
2031	0.020	0.020	0.850	\$75.00	\$100.95	\$83.55	\$112.45	\$94.95	\$96.30	\$86.90
2032	0.020	0.020	0.850	\$75.00	\$102.95	\$83.55	\$114.70	\$96.85	\$98.20	\$88.60
2033	0.020	0.020	0.850	\$75.00	\$105.00	\$83.55	\$117.00	\$98.80	\$100.20	\$90.40
2034	0.020	0.020	0.850	\$75.00	\$107.10	\$83.55	\$119.35	\$100.75	\$102.20	\$92.20
2035	0.020	0.020	0.850	\$75.00	\$109.25	\$83.55	\$121.70	\$102.80	\$104.25	\$94.05
2035+	2.00%	2.00%	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 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 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 Current	C\$/bbl Current	C\$/bbl Current	C\$/bbl Current	C\$/mcf Current	C\$/mcf Real	C\$/mcf Current	C\$/mcf Current	US\$/Mcf Real	US\$/Mcf Current	C\$/t Current		
<b>Historical</b>													
2006	\$17.20	\$44.76	\$56.71	\$77.30	\$5.94	\$7.40	\$6.25	\$5.87	\$7.51	\$6.34		\$13.61	
2007	\$18.42	\$49.75	\$59.35	\$81.60	\$6.20	\$7.50	\$6.45	\$6.40	\$8.12	\$6.98		\$38.02	
2008	\$22.59	\$56.96	\$83.54	\$109.77	\$7.88	\$9.29	\$8.16	\$8.20	\$10.09	\$8.86		\$303.83	
2009	\$11.61	\$34.62	\$56.21	\$69.49	\$3.85	\$4.40	\$3.96	\$4.17	\$4.39	\$3.95		(\$5.08)	
2010	\$11.53	\$45.19	\$68.79	\$84.02	\$3.76	\$4.44	\$4.01	\$4.01	\$4.86	\$4.39		\$56.94	
2011	\$10.30	\$52.41	\$86.98	\$105.24	\$3.46	\$3.95	\$3.63	\$3.34	\$4.35	\$4.00		\$101.60	
2012	\$6.73	\$30.80	\$75.47	\$99.67	\$2.25	\$2.53	\$2.39	\$2.29	\$2.91	\$2.75		\$126.81	
2013	\$8.68	\$38.54	\$77.44	\$103.52	\$2.98	\$3.30	\$3.17	\$3.11	\$3.88	\$3.73		\$62.17	
2014	\$12.46	\$38.38	\$57.08	\$100.90	\$4.22	\$4.64	\$4.50	\$4.16	\$4.53	\$4.39		\$88.99	
2015	\$7.49	\$0.76	\$25.12	\$52.96	\$2.56	\$2.72	\$2.69	\$1.81	\$2.66	\$2.63		\$107.45	
<b>2016</b>													
3 Months H	\$4.51	\$0.00	\$19.97	\$47.32	\$1.58	\$1.62	\$1.62	\$1.25	\$2.04	\$2.04		\$87.32	
9 Months F	\$5.90	\$6.00	\$23.90	\$59.75	\$1.90	\$2.10	\$2.10	\$1.60	\$2.60	\$2.60		\$100.00	
Avg.	\$5.20	\$3.00	\$21.93	\$53.54	\$1.74	\$1.86	\$1.86	\$1.42	\$2.32	\$2.32		\$93.66	
<b>Forecast</b>													
2016	\$5.90	\$6.00	\$23.90	\$59.75	\$1.90	\$2.10	\$2.10	\$1.60	\$2.60	\$2.60		\$100.00	
2017	\$7.55	\$12.50	\$31.25	\$62.50	\$2.50	\$2.65	\$2.70	\$2.20	\$2.85	\$2.90		\$102.00	
2018	\$8.60	\$20.20	\$40.35	\$67.25	\$2.85	\$2.95	\$3.05	\$2.55	\$3.00	\$3.10		\$104.05	
2019	\$8.90	\$21.60	\$43.20	\$72.00	\$2.95	\$3.00	\$3.20	\$2.65	\$3.10	\$3.30		\$106.10	
2020	\$9.40	\$23.35	\$46.60	\$77.65	\$3.15	\$3.10	\$3.35	\$2.80	\$3.25	\$3.50		\$108.25	
2021	\$9.90	\$25.35	\$50.60	\$84.40	\$3.30	\$3.20	\$3.55	\$3.00	\$3.30	\$3.65		\$110.40	
2022	\$10.60	\$27.40	\$54.85	\$91.45	\$3.55	\$3.35	\$3.75	\$3.20	\$3.45	\$3.90		\$112.60	
2023	\$11.45	\$28.75	\$57.60	\$95.95	\$3.85	\$3.55	\$4.10	\$3.50	\$3.60	\$4.15		\$114.85	
2024	\$12.15	\$29.35	\$58.75	\$97.90	\$4.10	\$3.70	\$4.35	\$3.75	\$3.75	\$4.40		\$117.15	
2025	\$13.05	\$29.95	\$59.95	\$99.85	\$4.40	\$3.90	\$4.65	\$4.05	\$3.90	\$4.65		\$119.50	
2026	\$13.65	\$30.55	\$61.15	\$101.85	\$4.65	\$4.00	\$4.90	\$4.25	\$4.00	\$4.90		\$121.90	
2027	\$14.10	\$31.15	\$62.35	\$103.90	\$4.80	\$4.05	\$5.05	\$4.40	\$4.05	\$5.05		\$124.35	
2028	\$14.60	\$31.75	\$63.60	\$105.95	\$4.95	\$4.10	\$5.20	\$4.55	\$4.10	\$5.20		\$126.80	
2029	\$14.90	\$32.40	\$64.85	\$108.10	\$5.05	\$4.10	\$5.30	\$4.65	\$4.10	\$5.30		\$129.35	
2030	\$15.15	\$33.05	\$66.15	\$110.25	\$5.15	\$4.10	\$5.40	\$4.75	\$4.10	\$5.40		\$131.95	
2031	\$15.50	\$33.70	\$67.50	\$112.45	\$5.25	\$4.10	\$5.50	\$4.85	\$4.10	\$5.50		\$134.60	
2032	\$15.80	\$34.40	\$68.85	\$114.70	\$5.35	\$4.10	\$5.65	\$4.95	\$4.10	\$5.65		\$137.30	
2033	\$16.10	\$35.10	\$70.20	\$117.00	\$5.45	\$4.10	\$5.75	\$5.05	\$4.10	\$5.75		\$140.00	
2034	\$16.40	\$35.80	\$71.65	\$119.35	\$5.55	\$4.10	\$5.85	\$5.15	\$4.10	\$5.85		\$142.80	
2035	\$16.75	\$36.50	\$73.05	\$121.70	\$5.70	\$4.10	\$5.95	\$5.25	\$4.10	\$5.95		\$145.70	
2035+	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 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 2016 dollars with no escalation considered
- Alberta gas prices, except AECCO, 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	Heavy Oil (12° API)	Synbit (AWB) 70% Bitumen 30% Cond. (21° API)	Delivered to Sarnia MSW	Ontario Dawn Ref. Point
	C\$/bbl	C\$/bbl	C\$/bbl	C\$/bbl	C\$/bbl	C\$/mcf
	Current	Current	Current	Current	Current	Current
<b>Historical</b>						
2006	\$66.31	\$63.28	\$41.89	\$52.51	\$75.55	\$7.52
2007	\$70.06	\$64.87	\$39.76	\$52.32	\$78.48	\$7.43
2008	\$95.28	\$92.40	\$73.08	\$84.08	\$109.21	\$9.88
2009	\$64.04	\$63.76	\$54.40	\$58.92	\$69.29	\$4.80
2010	\$76.40	\$72.32	\$60.62	\$67.64	\$81.48	\$4.79
2011	\$92.13	\$83.39	\$69.60	\$80.29	\$99.26	\$4.34
2012	\$84.27	\$77.53	\$64.07	\$74.75	\$90.36	\$3.11
2013	\$91.76	\$82.65	\$65.49	\$76.90	\$97.33	\$4.13
2014	\$92.91	\$89.39	\$73.70	\$81.86	\$98.19	\$5.76
2015	\$55.46	\$54.70	\$39.63	\$43.63	\$63.84	\$3.72
<b>2016</b>						
3 Months H	\$45.56	\$43.33	\$28.63	\$34.24	\$52.26	\$3.02
9 Months F	\$57.75	\$55.75	\$40.75	\$46.45	\$64.75	\$3.65
Avg.	\$51.65	\$49.54	\$34.69	\$40.34	\$58.51	\$3.34
<b>Forecast</b>						
2016	\$57.75	\$55.75	\$40.75	\$46.45	\$64.75	\$3.65
2017	\$60.45	\$58.40	\$43.10	\$48.90	\$67.60	\$3.90
2018	\$65.20	\$63.10	\$47.50	\$53.40	\$72.45	\$4.05
2019	\$69.90	\$67.75	\$51.85	\$57.90	\$77.30	\$4.20
2020	\$75.50	\$73.35	\$57.10	\$63.25	\$83.10	\$4.40
2021	\$82.20	\$80.00	\$63.45	\$69.70	\$89.95	\$4.60
2022	\$89.20	\$86.95	\$70.05	\$76.45	\$97.10	\$4.85
2023	\$93.70	\$91.40	\$74.15	\$80.70	\$101.70	\$5.15
2024	\$95.55	\$93.20	\$75.65	\$82.30	\$103.75	\$5.45
2025	\$97.45	\$95.05	\$77.15	\$83.95	\$105.85	\$5.80
2026	\$99.40	\$96.95	\$78.70	\$85.65	\$107.95	\$6.05
2027	\$101.40	\$98.90	\$80.25	\$87.35	\$110.10	\$6.20
2028	\$103.45	\$100.90	\$81.85	\$89.10	\$112.30	\$6.40
2029	\$105.50	\$102.90	\$83.50	\$90.90	\$114.55	\$6.55
2030	\$107.60	\$104.95	\$85.15	\$92.70	\$116.85	\$6.65
2031	\$109.75	\$107.05	\$86.90	\$94.55	\$119.20	\$6.80
2032	\$111.95	\$109.20	\$88.60	\$96.45	\$121.55	\$6.95
2033	\$114.20	\$111.40	\$90.40	\$98.35	\$124.00	\$7.05
2034	\$116.45	\$113.60	\$92.20	\$100.35	\$126.45	\$7.20
2035	\$118.80	\$115.90	\$94.05	\$102.35	\$129.00	\$7.35
2035+	2.00%	2.00%	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 bitumen (70%) and Condensate (30%) stream equivalent to the Acces Western Blend (AWB)

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# International forecast

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 Real	US\$/bbl Real	US\$/bbl Real	US\$/bbl Real	US\$/bbl Real	US\$/bbl Real	US\$/bbl Real	US\$/bbl Real	US\$/bbl Real	US\$/bbl Real	US\$/bbl Real	US\$/bbl Real	US\$/bbl Real	US\$/bbl Real	US\$/bbl Real	US\$/bbl Real
<b>Forecast</b>																
2016	\$50.00	\$43.00	\$45.00	\$48.50	\$49.50	\$46.00	\$44.00	\$51.00	\$46.00	\$48.00	\$40.00	\$51.50	\$49.00	\$43.00	\$49.50	\$48.00
2017	\$53.00	\$46.00	\$48.00	\$51.50	\$52.50	\$49.00	\$47.00	\$54.00	\$49.00	\$51.00	\$43.00	\$54.50	\$52.00	\$46.00	\$52.50	\$51.00
2018	\$57.00	\$50.00	\$52.00	\$55.50	\$56.50	\$53.00	\$51.00	\$58.00	\$53.00	\$55.00	\$47.00	\$58.50	\$56.00	\$50.00	\$56.50	\$55.00
2019	\$61.00	\$54.00	\$56.00	\$59.50	\$60.50	\$57.00	\$55.00	\$62.00	\$57.00	\$59.00	\$51.00	\$62.50	\$60.00	\$54.00	\$60.50	\$59.00
2020	\$65.00	\$58.00	\$60.00	\$63.50	\$64.50	\$61.00	\$59.00	\$66.00	\$61.00	\$63.00	\$55.00	\$66.50	\$64.00	\$58.00	\$64.50	\$63.00
2021	\$69.00	\$62.00	\$64.00	\$67.50	\$68.50	\$65.00	\$63.00	\$70.00	\$65.00	\$67.00	\$59.00	\$70.50	\$68.00	\$62.00	\$68.50	\$67.00
2022	\$73.00	\$66.00	\$68.00	\$71.50	\$72.50	\$69.00	\$67.00	\$74.00	\$69.00	\$71.00	\$63.00	\$74.50	\$72.00	\$66.00	\$72.50	\$71.00
2023	\$75.00	\$68.00	\$70.00	\$73.50	\$74.50	\$71.00	\$69.00	\$76.00	\$71.00	\$73.00	\$65.00	\$76.50	\$74.00	\$68.00	\$74.50	\$73.00
2024	\$75.00	\$68.00	\$70.00	\$73.50	\$74.50	\$71.00	\$69.00	\$76.00	\$71.00	\$73.00	\$65.00	\$76.50	\$74.00	\$68.00	\$74.50	\$73.00
2025	\$75.00	\$68.00	\$70.00	\$73.50	\$74.50	\$71.00	\$69.00	\$76.00	\$71.00	\$73.00	\$65.00	\$76.50	\$74.00	\$68.00	\$74.50	\$73.00
2026	\$75.00	\$68.00	\$70.00	\$73.50	\$74.50	\$71.00	\$69.00	\$76.00	\$71.00	\$73.00	\$65.00	\$76.50	\$74.00	\$68.00	\$74.50	\$73.00
2027	\$75.00	\$68.00	\$70.00	\$73.50	\$74.50	\$71.00	\$69.00	\$76.00	\$71.00	\$73.00	\$65.00	\$76.50	\$74.00	\$68.00	\$74.50	\$73.00
2028	\$75.00	\$68.00	\$70.00	\$73.50	\$74.50	\$71.00	\$69.00	\$76.00	\$71.00	\$73.00	\$65.00	\$76.50	\$74.00	\$68.00	\$74.50	\$73.00
2029	\$75.00	\$68.00	\$70.00	\$73.50	\$74.50	\$71.00	\$69.00	\$76.00	\$71.00	\$73.00	\$65.00	\$76.50	\$74.00	\$68.00	\$74.50	\$73.00
2030	\$75.00	\$68.00	\$70.00	\$73.50	\$74.50	\$71.00	\$69.00	\$76.00	\$71.00	\$73.00	\$65.00	\$76.50	\$74.00	\$68.00	\$74.50	\$73.00
2031	\$75.00	\$68.00	\$70.00	\$73.50	\$74.50	\$71.00	\$69.00	\$76.00	\$71.00	\$73.00	\$65.00	\$76.50	\$74.00	\$68.00	\$74.50	\$73.00
2032	\$75.00	\$68.00	\$70.00	\$73.50	\$74.50	\$71.00	\$69.00	\$76.00	\$71.00	\$73.00	\$65.00	\$76.50	\$74.00	\$68.00	\$74.50	\$73.00
2033	\$75.00	\$68.00	\$70.00	\$73.50	\$74.50	\$71.00	\$69.00	\$76.00	\$71.00	\$73.00	\$65.00	\$76.50	\$74.00	\$68.00	\$74.50	\$73.00
2034	\$75.00	\$68.00	\$70.00	\$73.50	\$74.50	\$71.00	\$69.00	\$76.00	\$71.00	\$73.00	\$65.00	\$76.50	\$74.00	\$68.00	\$74.50	\$73.00
2035	\$75.00	\$68.00	\$70.00	\$73.50	\$74.50	\$71.00	\$69.00	\$76.00	\$71.00	\$73.00	\$65.00	\$76.50	\$74.00	\$68.00	\$74.50	\$73.00
2035+	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	Gulf Coast (onshore)	Louisiana East Texas	Rocky Mtn. Opal	UK NBP	India Domestic Gas	US CBOT Ethanol
	Real	Real	US\$/Mcf	US\$/Mcf	US\$/Mcf	US\$/Mcf	US\$/Mcf	US\$/Mcf	US\$/gal.	US\$/bbi	US\$/bbi
<b>Forecast</b>											
2016	1.470	1.100	\$2.60	\$2.45	\$2.45	\$2.50	\$2.55	\$2.50	\$5.10	\$2.80	\$1.45
2017	1.470	1.100	\$2.85	\$2.70	\$2.70	\$2.75	\$2.80	\$2.75	\$5.35	\$2.70	\$1.45
2018	1.470	1.100	\$3.00	\$2.85	\$2.85	\$2.90	\$2.95	\$2.90	\$5.50	\$2.95	\$1.45
2019	1.470	1.100	\$3.10	\$2.95	\$2.95	\$3.00	\$3.05	\$3.00	\$5.60	\$3.15	\$1.45
2020	1.470	1.100	\$3.25	\$3.10	\$3.10	\$3.15	\$3.20	\$3.15	\$5.75	\$3.25	\$1.45
2021	1.470	1.100	\$3.30	\$3.15	\$3.15	\$3.20	\$3.25	\$3.20	\$5.80	\$3.35	\$1.45
2022	1.470	1.100	\$3.45	\$3.30	\$3.30	\$3.35	\$3.40	\$3.35	\$5.95	\$3.45	\$1.45
2023	1.470	1.100	\$3.60	\$3.45	\$3.45	\$3.50	\$3.55	\$3.50	\$6.10	\$3.55	\$1.45
2024	1.470	1.100	\$3.75	\$3.60	\$3.60	\$3.65	\$3.70	\$3.65	\$6.25	\$3.75	\$1.45
2025	1.470	1.100	\$3.90	\$3.75	\$3.75	\$3.80	\$3.85	\$3.80	\$6.40	\$3.85	\$1.45
2026	1.470	1.100	\$4.00	\$3.85	\$3.85	\$3.90	\$3.95	\$3.90	\$6.50	\$4.05	\$1.45
2027	1.470	1.100	\$4.05	\$3.90	\$3.90	\$3.95	\$4.00	\$3.95	\$6.55	\$4.15	\$1.45
2028	1.470	1.100	\$4.10	\$3.95	\$3.95	\$4.00	\$4.05	\$4.00	\$6.60	\$4.15	\$1.45
2029	1.470	1.100	\$4.10	\$3.95	\$3.95	\$4.00	\$4.05	\$4.00	\$6.60	\$4.20	\$1.45
2030	1.470	1.100	\$4.10	\$3.95	\$3.95	\$4.00	\$4.05	\$4.00	\$6.60	\$4.20	\$1.45
2031	1.470	1.100	\$4.10	\$3.95	\$3.95	\$4.00	\$4.05	\$4.00	\$6.60	\$4.20	\$1.45
2032	1.470	1.100	\$4.10	\$3.95	\$3.95	\$4.00	\$4.05	\$4.00	\$6.60	\$4.20	\$1.45
2033	1.470	1.100	\$4.10	\$3.95	\$3.95	\$4.00	\$4.05	\$4.00	\$6.60	\$4.20	\$1.45
2034	1.470	1.100	\$4.10	\$3.95	\$3.95	\$4.00	\$4.05	\$4.00	\$6.60	\$4.20	\$1.45
2035	1.470	1.100	\$4.10	\$3.95	\$3.95	\$4.00	\$4.05	\$4.00	\$6.60	\$4.20	\$1.45
2035+	1.470	1.100	0.00%	0.00%	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
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
DCQ	Daily Contract Quantity
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
NIT	Nova Inventory Transfer
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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