



Price forecast

Oil, gas & chemicals

September 30, 2020



Forecast commentary	2
The oil and gas sector in the wake of COVID-19: perspectives from Latin America	8
Canadian domestic price forecast	10
International price forecast	12
Global trends	13
Canadian domestic price tables	15
International price tables	18
Price philosophy	20



Forecast commentary

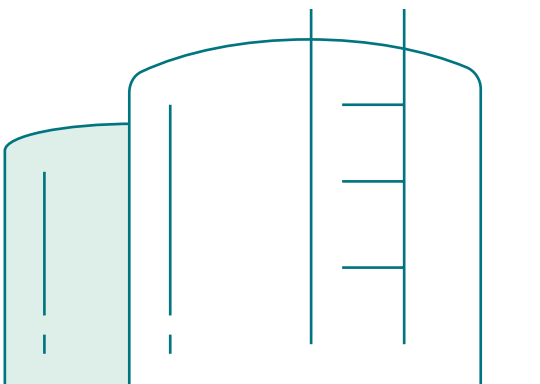
Uncertainty of a second wave looms over oil prices

In Q3, many regions were reducing lockdown restrictions and attempting to restart economies. This led to steady oil-price recovery over the summer months thanks to rebounding demand. With virus resurgence looming for the fall, the economic recovery is difficult to predict. You can read about Deloitte's view on economic recovery in our recently published September [Economic Outlook](#). Predicting the future has always been difficult, but the current disruption to the energy sector has made it even harder. Scenario analysis has never been more important to help companies adapt and make decisions about investment.

Globally, the oil and gas industry is facing two concurrent crises: COVID-19 and the oil-price collapse. For Canada, however, the industry has the additional challenges of market access and stakeholder resistance. Deloitte recently

released a scenario analysis of how the Canadian oil and gas industry may evolve over the next 10 to 15 years. Valuation scenario planning provides possible future scenarios and describes the implications for strategic and operational choices in an environment of increased uncertainty, and identifies short- and long-term decisions to help companies rethink how to compete and thrive in these environments. Within this study, Deloitte focuses on the pace of the erosion of oil and gas demand as well as the competitiveness of the Canadian sector among international players. The publication details the ways in which rapid erosion of demand will require agility from Canadian producers, whereas slower erosion of demand will allow more time for companies to determine development initiatives. For more information, read [Deloitte's Navigating uncertainty: Scenarios for Canadian oil and gas leaders](#).

Oil prices rallied over the summer months as consumer demand began to rebound amid continued supply cuts, resulting in global storage-level reductions from their highs in the second quarter.

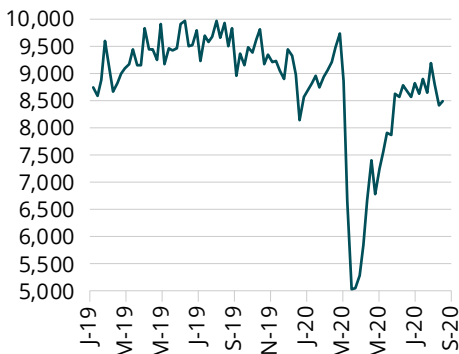


As mentioned, oil prices rallied over the summer months as consumer demand began to rebound amid continued supply cuts, resulting in global storage-level reductions from their highs in the second quarter. North American crude oil prices showed promising growth over the past three months, with WTI reaching over US\$42/bbl in August 2020. This is a US\$25/bbl increase from April pandemic prices. In an effort to stabilize prices, the OPEC+ meeting in August resulted in extended production cuts until the end of 2020, but reduced these cuts from 9.7 MMbbl/d to 7.7 MMbbl/d for the remainder of the year. The International Energy Agency's (IEA) August forecast suggests slightly slower demand recovery than its previous forecasts, primarily due to the struggling aviation sector, supporting the continued need for crude oil supply cuts. The U.S. Energy Information Administration (EIA) predicts a balance in global supply and demand will be reached by Q2 2021, but as nations continue to combat the pandemic, demand forecasts remain

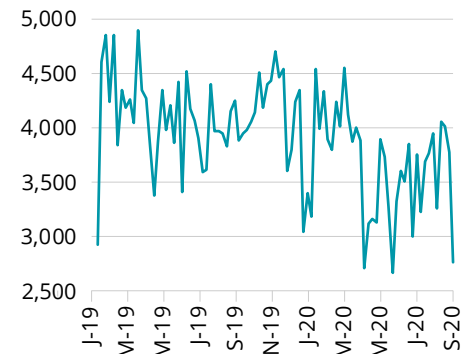
volatile and the risk of oversupply continues to loom over the industry. A lingering concern in Q3 2020 during the stabilized oil-price environment has been the recurrence of significant oversupply as producers begin bringing their curtailed production back on-stream in response to more favourable pricing. Sustaining rising production levels will rely on near-term market demand growth. However, fears about virus resurgence have pulled WTI prices below US\$40/bbl and halted the steady growth that had been encouraging producers to restart wells.

Storage levels in the United States (US) decreased over the summer as domestic demand began to rebound amid decreased production levels. Overall, fuel demand increased in Q3 2020, with gasoline leading the recovery. Jet fuel continues to lag behind the others as many countries maintain border closures with the US and limited flight activity around the globe.

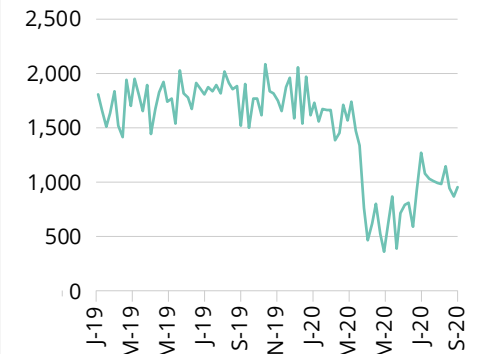
US gasoline supply (Mbbbl/d)



US diesel supply (Mbbbl/d)



US jet fuel supply (Mbbbl/d)



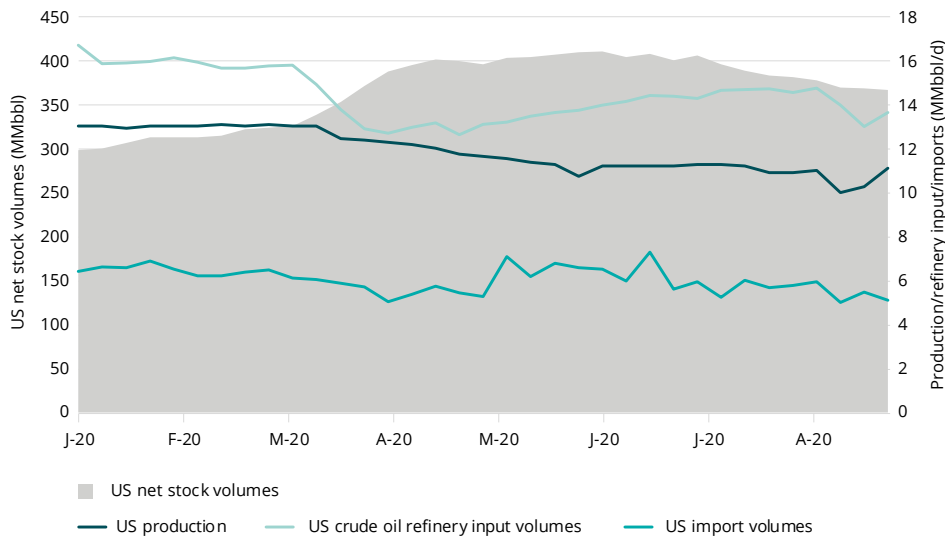
Source: EIA

Overall, US crude-oil stock volumes have decreased by 10 percent from their peak at the beginning of June. While US domestic production levels and import volumes remained fairly flat over the summer months, domestic product demand and refinery input volumes have increased, resulting in storage draw-downs. However, the current levels are still the highest they have been in the past five years, and any dent in demand recovery will push prices down.

Canadian prices have shown similar stability to WTI prices during Q3, with Edmonton and Western Canadian Select (WCS) prices

experiencing narrow differentials to WTI. North American crude-oil consumption continues to increase, and Canadian producers are expected to ramp up production if stable market conditions persist. Integrated companies have stated they see the downstream sector as a leading indicator of industry recovery, as it directly correlates to consumer demand. These companies were cautiously optimistic throughout the summer; Canadian refineries increased throughput as domestic product demand rose amid ease of lockdown conditions.

US production, imports, refinery inputs, and stock volumes



Source: EIA (net stock volumes exclude crude oil in transit)



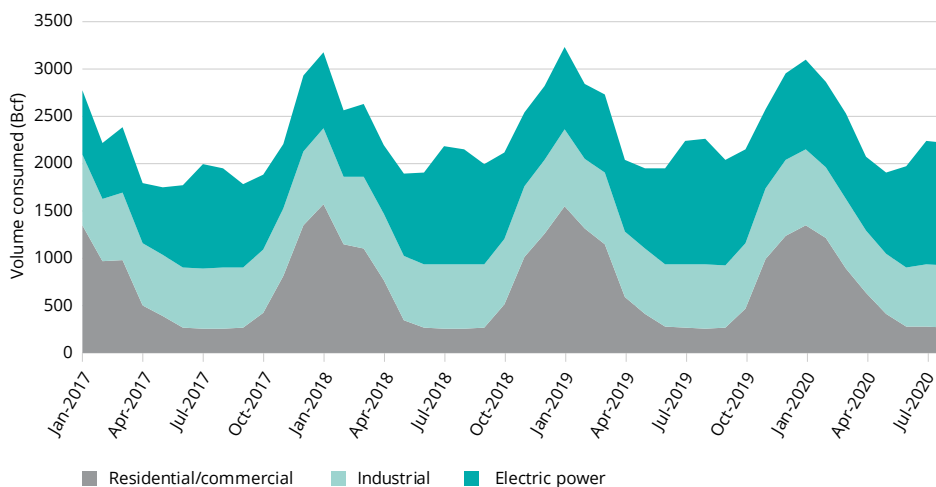
Summer temperatures bring pricing relief to beleaguered natural gas producers

US natural gas prices have enjoyed a recent jump over the last quarter as production remained depressed, with dry shale gas production down 4.7 billion cubic feet per day (Bcf/d) compared with January 2020 levels, reflecting a 6.5 percent drop. Reduced oil production has led to lower associated gas production as expected, which has supported the recent price increase even though storage levels are creeping above the maximum levels of the past five years. Besides lower production, consistent demand in both the industrial and electric power sectors—as well as above-average temperatures across most of the US, which has resulted in increased electricity demand—has supported the price jump.

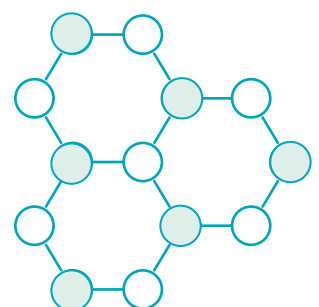
Liquefied natural gas (LNG) markets within the US have also shown some rebound over the summer, as natural gas deliveries to LNG export facilities increased 30 percent in August. At the end of August, six vessels departed the US, shipping 21 billion cubic feet (Bcf) internationally. However, Hurricane Laura caused short-term issues along the Gulf Coast, with at least one LNG facility reporting damage to their operations.

As the weather cools and underground US natural gas storage continues to outpace typical levels, we expect Henry Hub prices to fall from the summer highs as we head into Q4.

US natural gas consumption



Source: EIA



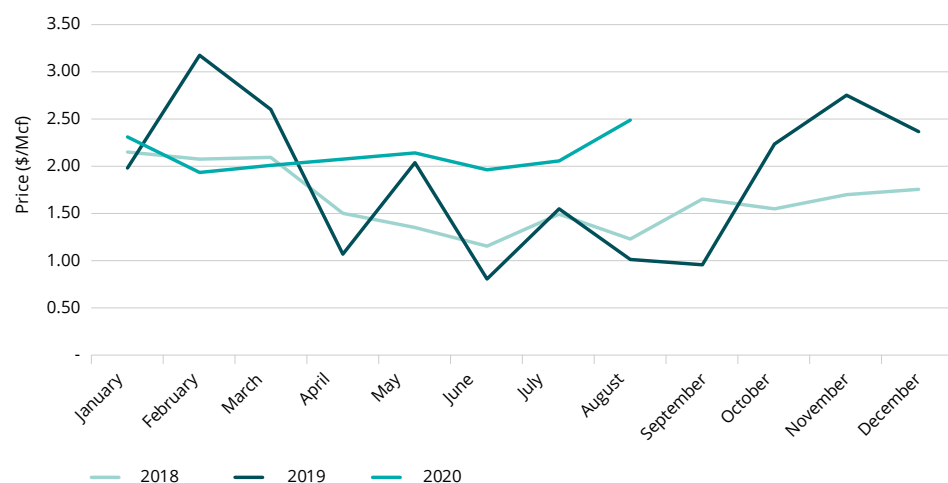
Price stability for Canadian natural gas markets

Canadian natural gas markets continue to show strength not seen in recent years, particularly during the spring and summer months, which are historically injection seasons with low prices. The Nova Gas Transmission (NGTL) system amendments announced last year, as well as decreased production volumes, have contributed to the price stability by allowing producers access to summer storage. Stable AECO prices have provided natural gas producers some flexibility on their balance sheets as natural gas liquids struggle to generate the cash flow needed. Slightly more activity is expected for the Canadian natural gas sector heading into the winter drilling season; however, companies will most likely look to pay off debt rather than grow production.

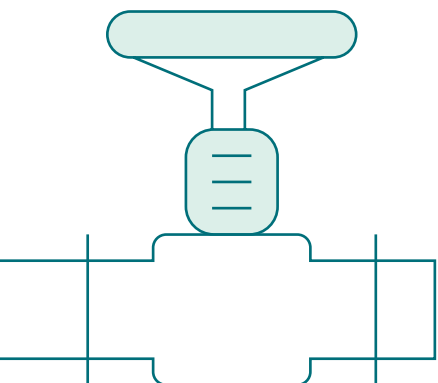
Over the past 12 months, more than \$1.8 billion in Montney Shale transactions occurred, indicating movement toward the long-discussed consolidation of that

play. Years of depressed natural gas prices and the recent drop in associated liquids pricing created cash-flow constraints and increased reliance on debt. Based on recent transactions, larger companies with more access to capital have targeted smaller operators within the Montney Shale play. Further amalgamation may be required to reduce costs by creating larger core areas with integrated infrastructure. For companies that have survived to date with low cost structures and limited capital spend, the winter drilling season may represent a make-or-break moment for their assets. If producers are able to increase current production levels and take advantage of higher AECO prices, they may be able to sustain operations until natural gas liquid prices are able to recover. However, consolidation may be the only option moving forward within Montney Shale, as small and mid-size producers continue to struggle with raising capital and meeting pipeline commitments.

AECO price



Source: DOB



Worldwide LNG export capacity was expected to grow by around 70 million tonnes in 2020, similar to 2019 values. However, demand destruction due to the COVID-19 pandemic has led many companies to delay investment decisions on LNG projects, including those in North America. The delay in 2020 project decisions may benefit the LNG market and allow for a supply/demand balance after the supply glut caused when the US brought record LNG capacity on-stream last year. The Canadian Energy Research Institute (CERI) assumes first shipments of Canadian LNG by 2024 within their recently released Canadian Crude Oil and Natural Gas Production and Emissions Outlook. Overall, the CERI study proposes 9.05 billion cubic feet per day (Bcf/d) of LNG capacity will be available by 2029, with the majority of capacity situated on the West Coast with the construction of LNG Canada and Kitimat LNG. Many nations are depending on natural gas to aid energy transition, and global LNG will be required to meet the increasing long-term natural gas demand. This could provide a competitive edge for Canada with natural gas development taking a prominent role in the industry. Canada can also re-purpose valuable assets for energy transition and set the stage through this transformation to thrive in a low-carbon world.

The delay in 2020 project decisions may benefit the LNG market and allow for a supply/demand balance after the supply glut caused when the US brought record LNG capacity on-stream last year.



The oil and gas sector in the wake of COVID-19: Perspectives from Latin America

In the wake of COVID-19, with nations around the world locking down to protect their citizens, decreased consumer activity meant that the oil and gas sector was especially hard hit. This spotlight focuses on Latin America, looking at some of the challenges faced in Argentina, Mexico, Colombia, and Peru, as well as the opportunities for growth as economies resume working and production and operations ramp up.

Challenging conditions for investment

As a result of lockdowns, Latin American nations experienced, as did other nations around the world, decreased economic activity and falling commodity prices, significantly impacting oil and gas revenues. Governments are facing rising national deficits exacerbated by the decrease in resource revenues. For Pemex, Mexico's national oil company, the impact of the pandemic has been significant: from April to June 2020, revenues decreased by almost 52 percent, as compared to the same period in 2019,¹ and oil production plunged to around 1.5 million barrels a day (MMbbl/d) in July.²

In response to these impacts, governments may look at other options to increase revenues, such as selling off parts of their ownership stakes in the national oil companies or creating incentives to attract

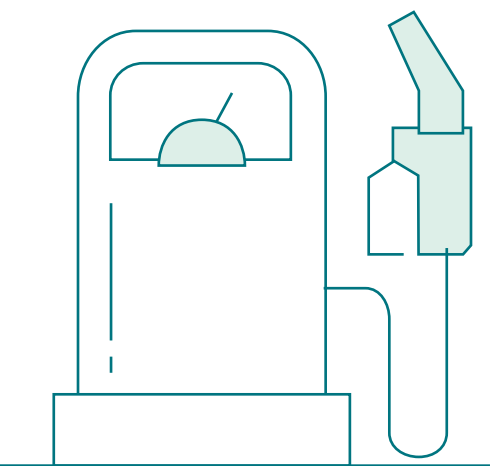
private investment. However, several of these nations also have high-risk profiles due to challenging regulatory regimes and bureaucracy, and this contributes to challenges accessing capital and enticing foreign investment. This will have an impact on future production and industry growth in the region: in Colombia, for example, oil and gas reserves remain stagnant, with limited reserve life remaining for existing development. Some efforts have been made to fill the production gap by fracking unconventional resources, with pilot investments recently approved, but environmental concerns still exist.

Similar to Canada, Latin America also faces challenges getting oil and gas resources to market. Investment in infrastructure is especially needed. Oil and gas fields in Peru can be difficult to access due to a lack of roads, rivers that are not easily navigated, and fields located in jungle regions that are protected due to environmental concerns. As well, there can be difficulties pushing relevant infrastructure projects due to corruption concerns, such as the construction of a gas pipeline in south Peru.³ In Mexico, infrastructure projects intended to expand the nation's storage capacity of gasoline and diesel have collapsed, and the companies involved are looking to shed their infrastructure investments.

¹ Pemex, Reporte de resultados no dictaminados, <https://www.pemex.com/ri/finanzas/Paginas/resultados.aspx>, September 17, 2020.

² Gobierno de México, Producción por operador <https://sih.hidrocarburos.gob.mx/>, September 17, 2020.

³ TeleSur, "Peru: Ollanta Humala accused of corruption linked to Odebrecht," September 1, 2020.



Development focused on natural gas and renewables

Latin American nations are net importers of natural gas, using it primarily for electricity generation. Development of domestic natural gas production and associated infrastructure will be a focus for growth for this region. Argentina meets more than half of its electricity demand using natural gas, and currently imports 20 to 25 percent of its natural gas. As a result, energy policy will likely be focused on improving prices through incentives to producers: the goal here is to increase production and reduce the dependence on imported volumes. Mexico will continue to be a net importer of natural gas, benefiting from increased production and competitive prices from US shale plays; as of June 2020, total demand was around 7.4 billion cubic feet (Bcf) and local production from Pemex was 2.5 Bcf.⁴ Colombia is focused on increasing imports for domestic use and has planned a regasification plant for the Pacific coast.

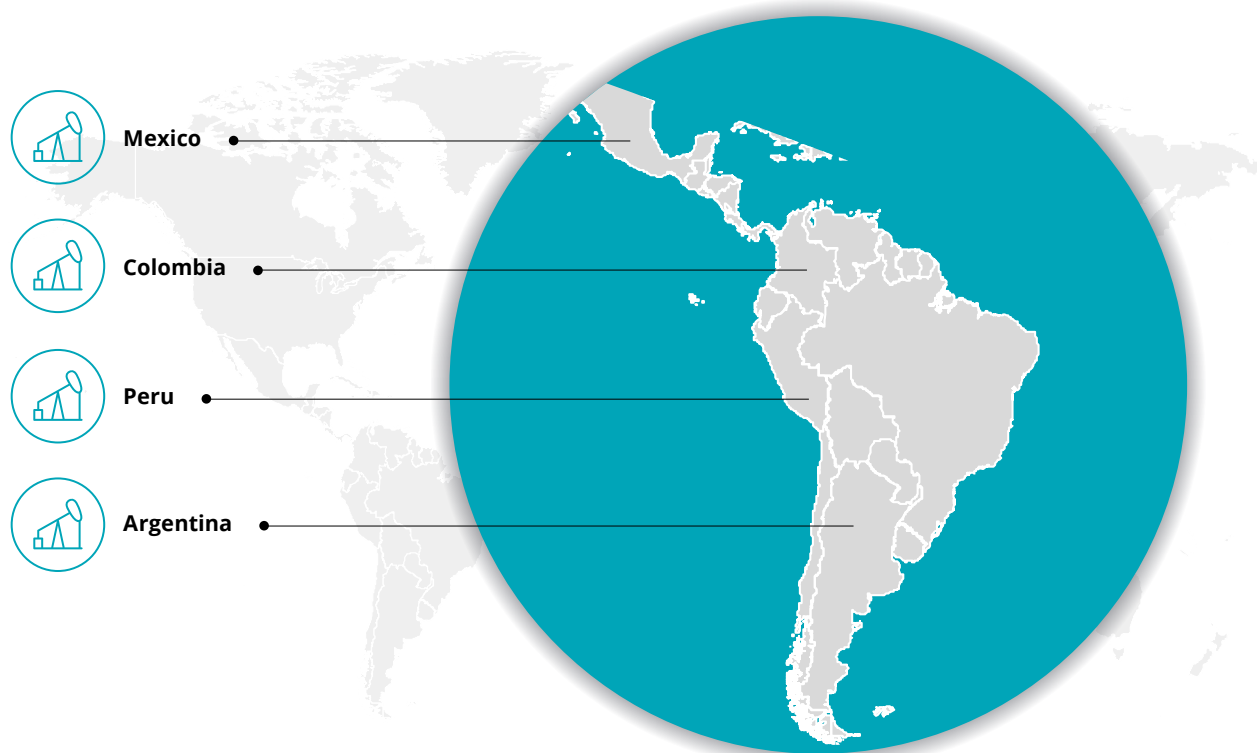
There will also be many opportunities for midstream and downstream investment in

coming years. In Argentina, there's a shift to the development of unconventional fields that could allow the nation to become a net hydrocarbon exporter in the foreseeable future; Colombia would reorganize its infrastructure and address the challenge of lowering transportation costs; and Mexico is building a new refinery. Downstream investment in the region will largely be focused on providing services through retail stations: Peru may see smaller retail gas stations absorbed by larger players, for example, and Mexico will be looking to expand the number of retail outlets to meet the needs of the population.

Environmental concerns are also likely to spur growth in the renewables sector, and several nations have specific goals that should drive investment. Argentina, for example, launched a renewable energy bidding program⁵ in 2017 to accomplish the country's target to produce 20 percent of its electricity from renewable sources by 2025. The program, *RenovAr*, has attracted foreign investment and lowered prices for renewable energy projects.⁶ In

Peru, the government has committed to increasing renewable energy consumption to 15 percent by 2030. Colombia also has a goal of 30 percent of its electricity to be from renewables by 2030. And in Mexico, the government has set a target to produce 35 percent clean energy by 2024, though recent developments⁷ make it unlikely the country will reach that goal.

On the face of it, these goals are certainly comparable to those set in other regions: Canada, for example, has a stated goal of reducing emissions from methane by 40 to 45 percent in 2025 compared with 2012 values, and the European Union has passed laws imposing a binding target for 32 percent of electricity to be generated from renewable sources by 2030. The major difference, of course, is that the oil and gas conversation in Europe and North America starts these days with environmental, social, and governance (ESG) considerations. In Latin America, ESG plays a much smaller role in the industry conversation, particularly regarding emissions.



⁴ Sener Secretaria de Energía, Prontuario estadístico Agosto 2020, https://www.gob.mx/cms/uploads/attachment/file/569886/Prontuario_agosto_2020.pdf, September 17, 2020.

⁵ Results Briefs, "Argentina taps its renewable energy potential," The World Bank, February 15, 2018.

⁶ Silvio Maracci, "Argentina may be the hottest renewable energy market you haven't heard of. Can it spur a global boom?" Forbes, October 15, 2019.

⁷ Justin Villamil, "Why Mexico is pushing to slow down clean energy," Bloomberg Green, July 16, 2020.

Canadian domestic price forecast

Crude oil price and market demand forecast

Edmonton par (real \$)



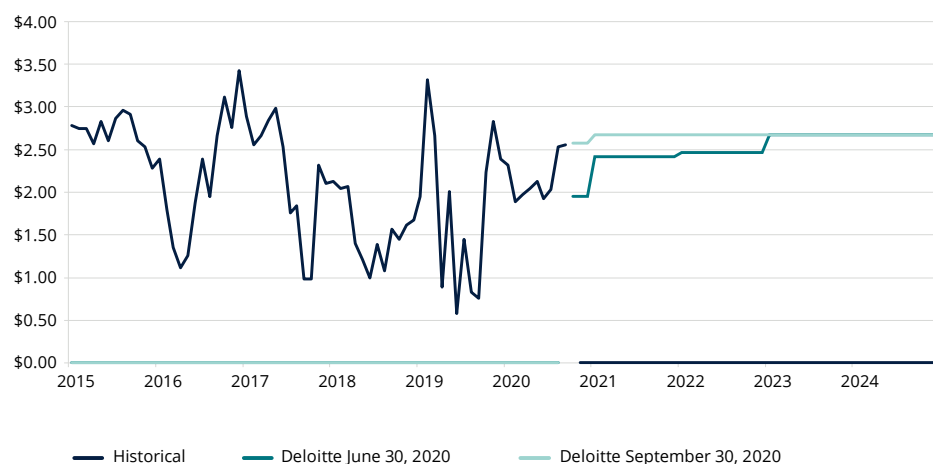
Forecast comments

- 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								
2017	\$53.96	\$50.88	\$65.62	\$61.88	\$50.53	\$45.01	1.6%	0.771
2018	\$67.76	\$64.94	\$72.10	\$69.10	\$49.68	\$45.34	2.3%	0.772
2019	\$58.11	\$56.98	\$70.39	\$69.02	\$58.75	\$55.11	1.9%	0.754
2020								
9 Mths H	\$38.15	\$38.15	\$44.42	\$44.42	\$33.29	\$29.68	1.1%	0.740
3 Mths F	\$41.50	\$41.50	\$49.35	\$49.35	\$41.45	\$38.45	0.0%	0.760
Avg.	\$38.99	\$38.99	\$45.65	\$45.65	\$35.33	\$31.88	-	0.745
Forecast								
2020	\$41.50	\$41.50	\$49.35	\$49.35	\$41.45	\$38.45	0.0%	0.760
2021	\$45.00	\$45.90	\$53.25	\$54.30	\$43.70	\$40.15	2.0%	0.770
2022	\$51.25	\$53.30	\$59.30	\$61.70	\$48.35	\$43.10	2.0%	0.780
2023	\$57.50	\$61.00	\$65.65	\$69.65	\$56.40	\$51.10	2.0%	0.800
2024	\$57.50	\$62.25	\$65.65	\$71.05	\$57.55	\$52.10	2.0%	0.800
2025	\$57.50	\$63.50	\$65.65	\$72.50	\$58.70	\$53.15	2.0%	0.800
2026	\$57.50	\$64.75	\$65.65	\$73.95	\$59.85	\$54.20	2.0%	0.800
2027	\$57.50	\$66.05	\$65.65	\$75.40	\$61.05	\$55.30	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	C\$/Mcf	C\$/Mcf	C\$/Mcf	US\$/Mcf	US\$/Mcf
	Current	Real	Current	Current	Real	Current
Historical						
2017	\$2.13	\$2.32	\$2.19	\$1.56	\$3.17	\$2.99
2018	\$1.36	\$1.61	\$1.54	\$1.26	\$3.30	\$3.17
2019	\$1.48	\$1.85	\$1.81	\$1.02	\$2.62	\$2.57
2020						
9 Mths H	\$1.89	\$2.14	\$2.14	\$2.11	\$1.90	\$1.90
3 Mths F	\$2.30	\$2.55	\$2.55	\$2.55	\$2.70	\$2.70
Avg.	\$2.00	\$2.24	\$2.24	\$2.22	\$2.10	\$2.10
Forecast						
2020	\$2.30	\$2.55	\$2.55	\$2.55	\$2.70	\$2.70
2021	\$2.45	\$2.65	\$2.70	\$2.70	\$2.70	\$2.75
2022	\$2.50	\$2.65	\$2.75	\$2.75	\$2.80	\$2.90
2023	\$2.55	\$2.65	\$2.80	\$2.80	\$2.90	\$3.10
2024	\$2.60	\$2.65	\$2.85	\$2.85	\$2.90	\$3.15
2025	\$2.65	\$2.65	\$2.95	\$2.95	\$2.90	\$3.20
2026	\$2.70	\$2.65	\$3.00	\$3.00	\$2.90	\$3.25
2027	\$2.75	\$2.65	\$3.05	\$3.05	\$2.90	\$3.35

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							
2020	\$41.50	\$43.50	\$39.50	\$43.00	\$44.50	\$37.50	\$44.00
2021	\$45.00	\$48.00	\$43.00	\$46.50	\$49.00	\$41.00	\$47.50
2022	\$51.25	\$55.25	\$49.25	\$53.75	\$56.25	\$48.25	\$54.75
2023	\$57.50	\$61.50	\$55.50	\$60.00	\$62.50	\$54.50	\$61.00
2024	\$57.50	\$61.50	\$55.50	\$60.00	\$62.50	\$54.50	\$61.00
2025	\$57.50	\$61.50	\$55.50	\$60.00	\$62.50	\$54.50	\$61.00
2026	\$57.50	\$61.50	\$55.50	\$60.00	\$62.50	\$54.50	\$61.00
2027	\$57.50	\$61.50	\$55.50	\$60.00	\$62.50	\$54.50	\$61.00

- 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% 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								
2020	1.30	1.20	\$2.70	\$1.70	\$2.30	\$2.50	\$4.25	\$1.80
2021	1.30	1.20	\$2.70	\$1.70	\$2.30	\$2.50	\$4.60	\$2.50
2022	1.30	1.20	\$2.80	\$2.05	\$2.40	\$2.60	\$5.05	\$2.65
2023	1.30	1.20	\$2.90	\$2.15	\$2.50	\$2.70	\$5.15	\$2.85
2024	1.30	1.20	\$2.90	\$2.15	\$2.50	\$2.70	\$5.15	\$2.90
2025	1.30	1.20	\$2.90	\$2.15	\$2.50	\$2.70	\$5.15	\$2.90
2026	1.30	1.20	\$2.90	\$2.15	\$2.50	\$2.70	\$5.15	\$2.90
2027	1.30	1.20	\$2.90	\$2.15	\$2.50	\$2.70	\$5.15	\$2.90

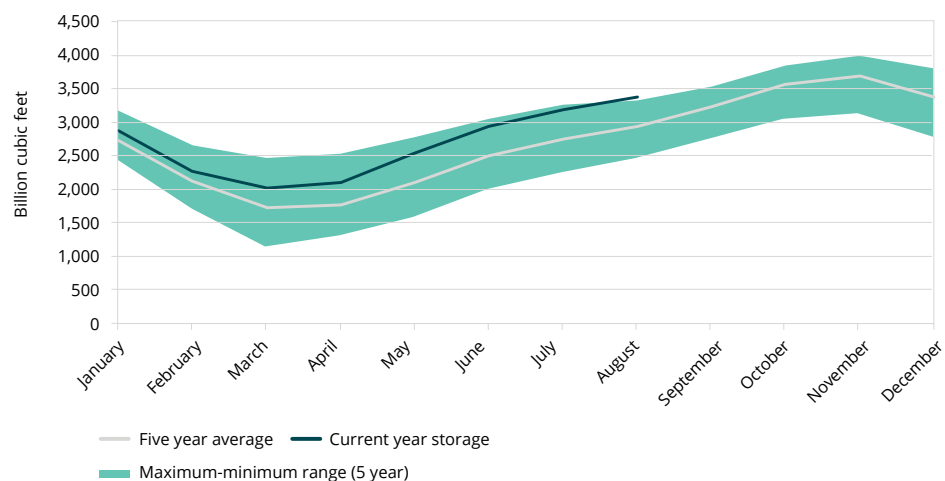
Global trends

Storage

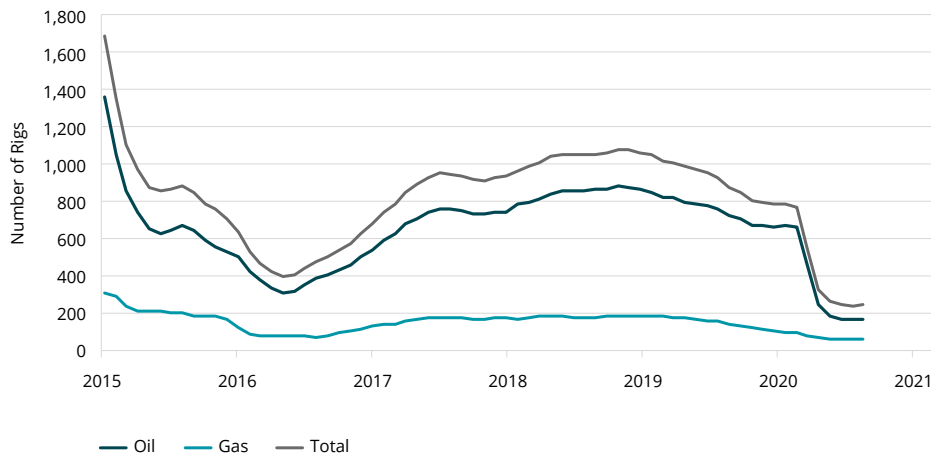
United States

- Natural gas storage in the United States is trending above the five year average as production continues to grow faster than demand. We expect that with lower associated gas production due to reduced oil drilling, along with forecasts of a cold winter, this trend will shift to align closer to the five year average.

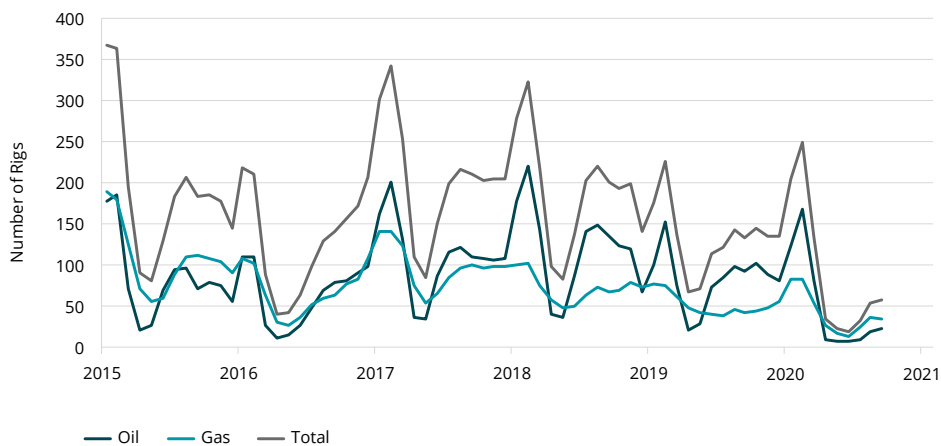
US natural gas storage



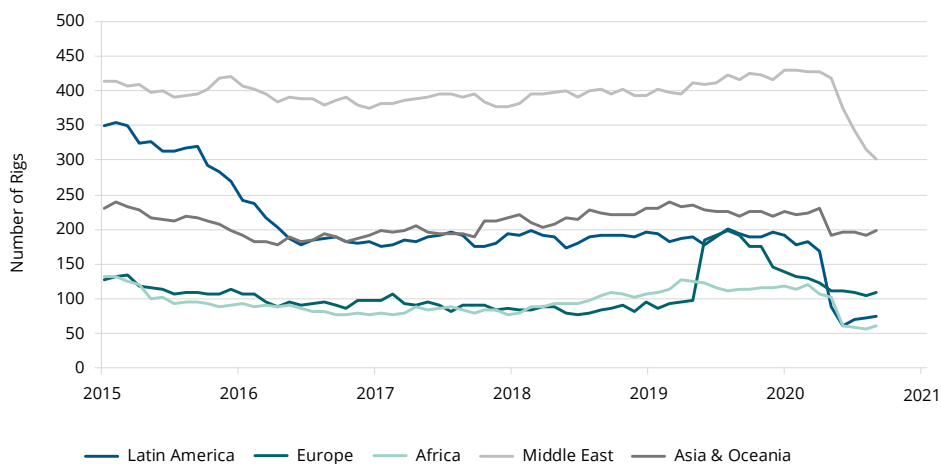
US rig counts



Canada rig counts



International rig counts



Rigs

United States

- Oil rig counts have stabilized in Q3 as prices have strengthened due to returning demand. Gas rig counts have also remained steady over the last several months but may begin to rise in response to strengthening prices heading into an expected cold winter.

Canada

- Rig counts remain extremely low, with both oil and gas activity down significantly. Entering the winter drilling season, gas rigs will likely increase in response to strong pricing while oil rigs remain at historically low levels.

International

- International rig counts have remained relatively steady except for the Middle East, which has seen a 30% drop in activity throughout 2020 due to continued production cuts implemented by OPEC nations. Notably, rig counts in the rest of the world have not dropped as significantly as in North America, who's share of total world rigs has dropped from over half in 2019 to less than 30%.

Canadian domestic price tables

Crude Oil Pricing								
Year	Price Inflation	Cost Inflation	CAD to USD Exchange	WTI at Cushing Oklahoma	WTI at Cushing Oklahoma	Edmonton City Gate	Edmonton City Gate	WCS 20.5 Deg. API Hardisty
	Rate	Rate	Rate	US\$/bbl Real	US\$/bbl Current	C\$/bbl Real	C\$/bbl Current	C\$/bbl Current
Historical								
2010	1.8%	1.8%	0.971	\$94.66	\$79.40	\$92.76	\$77.80	\$67.22
2011	2.9%	2.9%	1.012	\$111.14	\$94.88	\$111.90	\$95.54	\$77.12
2012	1.5%	1.5%	1.001	\$107.02	\$94.11	\$98.44	\$86.57	\$73.10
2013	0.9%	0.9%	0.972	\$109.64	\$97.91	\$104.55	\$93.36	\$74.97
2014	1.9%	1.9%	0.906	\$103.46	\$93.26	\$104.27	\$94.00	\$81.06
2015	1.1%	1.1%	0.783	\$52.98	\$48.69	\$62.02	\$57.00	\$44.80
2016	1.4%	1.4%	0.755	\$46.43	\$43.15	\$56.18	\$52.22	\$38.90
2017	1.6%	1.6%	0.771	\$53.96	\$50.88	\$65.62	\$61.88	\$50.53
2018	2.3%	2.3%	0.772	\$67.76	\$64.94	\$72.10	\$69.10	\$49.68
2019	1.9%	1.9%	0.754	\$58.11	\$56.98	\$70.39	\$69.02	\$58.75
2020								
9 Mths H	1.1%	1.1%	0.740	\$38.15	\$38.15	\$44.42	\$44.42	\$33.29
3 Mths F	0.0%	0.0%	0.760	\$41.50	\$41.50	\$49.35	\$49.35	\$41.45
Avg.	N/A	N/A	0.745	\$38.99	\$38.99	\$45.65	\$45.65	\$35.33
Forecast								
2020	0.0%	0.0%	0.760	\$41.50	\$41.50	\$49.35	\$49.35	\$41.45
2021	2.0%	2.0%	0.770	\$45.00	\$45.90	\$53.25	\$54.30	\$43.70
2022	2.0%	2.0%	0.780	\$51.25	\$53.30	\$59.30	\$61.70	\$48.35
2023	2.0%	2.0%	0.800	\$57.50	\$61.00	\$65.65	\$69.65	\$56.40
2024	2.0%	2.0%	0.800	\$57.50	\$62.25	\$65.65	\$71.05	\$57.55
2025	2.0%	2.0%	0.800	\$57.50	\$63.50	\$65.65	\$72.50	\$58.70
2026	2.0%	2.0%	0.800	\$57.50	\$64.75	\$65.65	\$73.95	\$59.85
2027	2.0%	2.0%	0.800	\$57.50	\$66.05	\$65.65	\$75.40	\$61.05
2028	2.0%	2.0%	0.800	\$57.50	\$67.35	\$65.65	\$76.90	\$62.25
2029	2.0%	2.0%	0.800	\$57.50	\$68.70	\$65.65	\$78.45	\$63.50
2030	2.0%	2.0%	0.800	\$57.50	\$70.10	\$65.65	\$80.05	\$64.80
2031	2.0%	2.0%	0.800	\$57.50	\$71.50	\$65.65	\$81.65	\$66.10
2032	2.0%	2.0%	0.800	\$57.50	\$72.90	\$65.65	\$83.25	\$67.40
2033	2.0%	2.0%	0.800	\$57.50	\$74.40	\$65.65	\$84.95	\$68.75
2034	2.0%	2.0%	0.800	\$57.50	\$75.85	\$65.65	\$86.60	\$70.15
2035	2.0%	2.0%	0.800	\$57.50	\$77.40	\$65.65	\$88.35	\$71.55
2036	2.0%	2.0%	0.800	\$57.50	\$78.95	\$65.65	\$90.10	\$72.95
2037	2.0%	2.0%	0.800	\$57.50	\$80.50	\$65.65	\$91.95	\$74.40
2038	2.0%	2.0%	0.800	\$57.50	\$82.10	\$65.65	\$93.75	\$75.90
2039	2.0%	2.0%	0.800	\$57.50	\$83.75	\$65.65	\$95.65	\$77.45
2039+	2.0%	2.0%	0.800	0.0%	2.0%	0.0%	2.0%	2.0%

Notes:

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- 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 2020 dollars with no escalation considered
- Alberta gas prices, except AEEO, include an average cost of service to the plant gate
- NGL prices have been switched from a mix reference to a spec reference

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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\$/bbl	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											
2010	\$11.53	\$45.19	\$68.79	\$84.02	\$3.76	\$4.78	\$4.01	\$4.01	\$5.23	\$4.39	\$56.94
2011	\$10.30	\$52.41	\$86.98	\$105.24	\$3.46	\$4.25	\$3.63	\$3.34	\$4.69	\$4.00	\$101.60
2012	\$6.73	\$30.80	\$75.47	\$99.67	\$2.25	\$2.72	\$2.39	\$2.29	\$3.13	\$2.75	\$126.81
2013	\$8.68	\$38.54	\$77.44	\$103.52	\$2.98	\$3.55	\$3.17	\$3.11	\$4.18	\$3.73	\$62.17
2014	\$12.46	\$42.93	\$59.43	\$101.47	\$4.22	\$5.00	\$4.50	\$4.16	\$4.87	\$4.39	\$88.99
2015	\$7.49	\$5.35	\$33.70	\$55.15	\$2.56	\$2.93	\$2.69	\$1.81	\$2.86	\$2.63	\$107.45
2016	\$6.04	\$8.71	\$31.45	\$52.43	\$1.93	\$2.32	\$2.16	\$1.75	\$2.71	\$2.52	\$45.40
2017	\$6.11	\$27.92	\$40.98	\$63.65	\$2.13	\$2.32	\$2.19	\$1.56	\$3.17	\$2.99	\$41.85
2018	\$6.90	\$29.76	\$46.17	\$75.74	\$1.36	\$1.61	\$1.54	\$1.26	\$3.30	\$3.17	\$89.25
2019	\$5.00	\$15.82	\$21.40	\$67.57	\$1.48	\$1.85	\$1.81	\$1.02	\$2.62	\$2.57	\$37.54
2020											
9 Mths H	\$6.04	\$14.01	\$18.91	\$44.95	\$1.89	\$2.14	\$2.14	\$2.11	\$1.90	\$1.90	\$4.36
3 Mths F	\$7.00	\$17.25	\$22.20	\$49.35	\$2.30	\$2.55	\$2.55	\$2.55	\$2.70	\$2.70	\$10.00
Avg.	\$6.28	\$14.82	\$19.73	\$46.05	\$2.00	\$2.24	\$2.24	\$2.22	\$2.10	\$2.10	\$5.77
Forecast											
2020	\$7.00	\$17.25	\$22.20	\$49.35	\$2.30	\$2.55	\$2.55	\$2.55	\$2.70	\$2.70	\$10.00
2021	\$7.45	\$24.45	\$29.90	\$54.30	\$2.45	\$2.65	\$2.70	\$2.70	\$2.70	\$2.75	\$30.60
2022	\$7.60	\$27.80	\$40.10	\$61.70	\$2.50	\$2.65	\$2.75	\$2.75	\$2.80	\$2.90	\$31.20
2023	\$7.75	\$31.35	\$45.25	\$69.65	\$2.55	\$2.65	\$2.80	\$2.80	\$2.90	\$3.10	\$31.85
2024	\$7.90	\$32.00	\$46.15	\$71.05	\$2.60	\$2.65	\$2.85	\$2.85	\$2.90	\$3.15	\$32.45
2025	\$8.05	\$32.65	\$47.10	\$72.50	\$2.65	\$2.65	\$2.95	\$2.95	\$2.90	\$3.20	\$33.10
2026	\$8.20	\$33.30	\$48.05	\$73.95	\$2.70	\$2.65	\$3.00	\$3.00	\$2.90	\$3.25	\$33.80
2027	\$8.40	\$33.95	\$49.00	\$75.40	\$2.75	\$2.65	\$3.05	\$3.05	\$2.90	\$3.35	\$34.45
2028	\$8.55	\$34.60	\$49.95	\$76.90	\$2.80	\$2.65	\$3.10	\$3.10	\$2.90	\$3.40	\$35.15
2029	\$8.70	\$35.30	\$50.95	\$78.45	\$2.85	\$2.65	\$3.15	\$3.15	\$2.90	\$3.45	\$35.85
2030	\$8.90	\$36.00	\$52.00	\$80.05	\$2.95	\$2.65	\$3.25	\$3.25	\$2.90	\$3.55	\$36.55
2031	\$9.10	\$36.75	\$53.05	\$81.65	\$3.00	\$2.65	\$3.30	\$3.30	\$2.90	\$3.60	\$37.30
2032	\$9.25	\$37.50	\$54.10	\$83.25	\$3.05	\$2.65	\$3.35	\$3.35	\$2.90	\$3.70	\$38.05
2033	\$9.45	\$38.25	\$55.15	\$84.95	\$3.10	\$2.65	\$3.45	\$3.45	\$2.90	\$3.75	\$38.80
2034	\$9.65	\$39.00	\$56.30	\$86.60	\$3.15	\$2.65	\$3.50	\$3.50	\$2.90	\$3.85	\$39.60
2035	\$9.80	\$39.75	\$57.40	\$88.35	\$3.25	\$2.65	\$3.55	\$3.55	\$2.90	\$3.90	\$40.40
2036	\$10.00	\$40.55	\$58.55	\$90.10	\$3.30	\$2.65	\$3.65	\$3.65	\$2.90	\$4.00	\$41.20
2037	\$10.20	\$41.40	\$59.70	\$91.95	\$3.35	\$2.65	\$3.70	\$3.70	\$2.90	\$4.05	\$42.00
2038	\$10.45	\$42.20	\$60.90	\$93.75	\$3.45	\$2.65	\$3.80	\$3.80	\$2.90	\$4.15	\$42.85
2039	\$10.65	\$43.05	\$62.15	\$95.65	\$3.50	\$2.65	\$3.85	\$3.85	\$2.90	\$4.20	\$43.70
2039+	2.0%	2.0%	2.0%	2.0%	2.0%	0.0%	2.0%	2.0%	0.0%	2.0%	2.0%

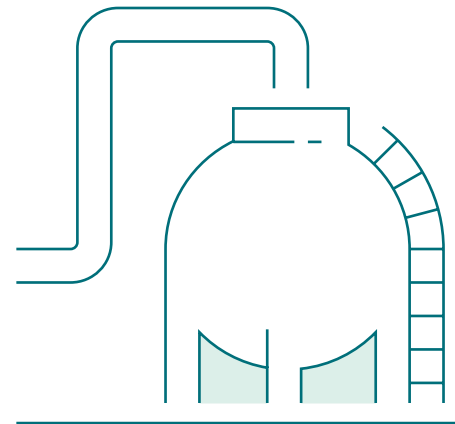
Notes:

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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	C\$/bbl	C\$/bbl	C\$/mcf
	Current	Current	Current	Current
Historical				
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	\$73.06	\$62.82	\$54.46	\$4.07
2019	\$69.68	\$65.72	\$58.85	\$3.22
2020				
9 Mths H	\$41.75	\$40.33	\$32.79	\$2.38
3 Mths F	\$50.35	\$47.35	\$41.70	\$3.35
Avg.	\$43.90	\$42.08	\$35.01	\$2.62
Forecast				
2020	\$50.35	\$47.35	\$41.70	\$3.35
2021	\$55.35	\$50.25	\$44.35	\$3.35
2022	\$62.75	\$57.55	\$48.70	\$3.55
2023	\$70.75	\$65.40	\$56.65	\$3.65
2024	\$72.15	\$66.75	\$57.80	\$3.75
2025	\$73.60	\$68.05	\$58.95	\$3.80
2026	\$75.05	\$69.45	\$60.15	\$3.90
2027	\$76.55	\$70.80	\$61.35	\$3.95
2028	\$78.10	\$72.25	\$62.55	\$4.05
2029	\$79.65	\$73.70	\$63.80	\$4.10
2030	\$81.25	\$75.15	\$65.10	\$4.20
2031	\$82.85	\$76.65	\$66.40	\$4.30
2032	\$84.55	\$78.20	\$67.70	\$4.40
2033	\$86.20	\$79.75	\$69.10	\$4.45
2034	\$87.95	\$81.35	\$70.45	\$4.55
2035	\$89.70	\$82.95	\$71.85	\$4.65
2036	\$91.50	\$84.65	\$73.30	\$4.75
2037	\$93.35	\$86.30	\$74.75	\$4.85
2038	\$95.20	\$88.05	\$76.25	\$4.95
2039	\$97.10	\$89.80	\$77.80	\$5.05
2039+	2.0%	2.0%	2.0%	2.0%



Notes:

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International price tables

Crude Oil Pricing																
Year	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																
2020	\$41.50	\$37.50	\$42.50	\$43.00	\$40.50	\$39.50	\$36.50	\$43.50	\$39.50	\$43.00	\$31.50	\$44.50	\$42.50	\$37.50	\$44.00	\$41.50
2021	\$45.00	\$41.00	\$46.00	\$46.50	\$44.00	\$43.00	\$40.00	\$48.00	\$43.00	\$46.50	\$38.00	\$49.00	\$47.00	\$41.00	\$47.50	\$45.00
2022	\$51.25	\$47.25	\$52.25	\$52.75	\$50.25	\$49.25	\$46.25	\$55.25	\$49.25	\$53.75	\$45.25	\$56.25	\$54.25	\$48.25	\$54.75	\$52.25
2023	\$57.50	\$53.50	\$58.50	\$59.00	\$56.50	\$55.50	\$52.50	\$61.50	\$55.50	\$60.00	\$51.50	\$62.50	\$60.50	\$54.50	\$61.00	\$58.50
2024	\$57.50	\$53.50	\$58.50	\$59.00	\$56.50	\$55.50	\$52.50	\$61.50	\$55.50	\$60.00	\$51.50	\$62.50	\$60.50	\$54.50	\$61.00	\$58.50
2025	\$57.50	\$53.50	\$58.50	\$59.00	\$56.50	\$55.50	\$52.50	\$61.50	\$55.50	\$60.00	\$51.50	\$62.50	\$60.50	\$54.50	\$61.00	\$58.50
2026	\$57.50	\$53.50	\$58.50	\$59.00	\$56.50	\$55.50	\$52.50	\$61.50	\$55.50	\$60.00	\$51.50	\$62.50	\$60.50	\$54.50	\$61.00	\$58.50
2027	\$57.50	\$53.50	\$58.50	\$59.00	\$56.50	\$55.50	\$52.50	\$61.50	\$55.50	\$60.00	\$51.50	\$62.50	\$60.50	\$54.50	\$61.00	\$58.50
2028	\$57.50	\$53.50	\$58.50	\$59.00	\$56.50	\$55.50	\$52.50	\$61.50	\$55.50	\$60.00	\$51.50	\$62.50	\$60.50	\$54.50	\$61.00	\$58.50
2029	\$57.50	\$53.50	\$58.50	\$59.00	\$56.50	\$55.50	\$52.50	\$61.50	\$55.50	\$60.00	\$51.50	\$62.50	\$60.50	\$54.50	\$61.00	\$58.50
2030	\$57.50	\$53.50	\$58.50	\$59.00	\$56.50	\$55.50	\$52.50	\$61.50	\$55.50	\$60.00	\$51.50	\$62.50	\$60.50	\$54.50	\$61.00	\$58.50
2031	\$57.50	\$53.50	\$58.50	\$59.00	\$56.50	\$55.50	\$52.50	\$61.50	\$55.50	\$60.00	\$51.50	\$62.50	\$60.50	\$54.50	\$61.00	\$58.50
2032	\$57.50	\$53.50	\$58.50	\$59.00	\$56.50	\$55.50	\$52.50	\$61.50	\$55.50	\$60.00	\$51.50	\$62.50	\$60.50	\$54.50	\$61.00	\$58.50
2033	\$57.50	\$53.50	\$58.50	\$59.00	\$56.50	\$55.50	\$52.50	\$61.50	\$55.50	\$60.00	\$51.50	\$62.50	\$60.50	\$54.50	\$61.00	\$58.50
2034	\$57.50	\$53.50	\$58.50	\$59.00	\$56.50	\$55.50	\$52.50	\$61.50	\$55.50	\$60.00	\$51.50	\$62.50	\$60.50	\$54.50	\$61.00	\$58.50
2035	\$57.50	\$53.50	\$58.50	\$59.00	\$56.50	\$55.50	\$52.50	\$61.50	\$55.50	\$60.00	\$51.50	\$62.50	\$60.50	\$54.50	\$61.00	\$58.50
2036	\$57.50	\$53.50	\$58.50	\$59.00	\$56.50	\$55.50	\$52.50	\$61.50	\$55.50	\$60.00	\$51.50	\$62.50	\$60.50	\$54.50	\$61.00	\$58.50
2037	\$57.50	\$53.50	\$58.50	\$59.00	\$56.50	\$55.50	\$52.50	\$61.50	\$55.50	\$60.00	\$51.50	\$62.50	\$60.50	\$54.50	\$61.00	\$58.50
2038	\$57.50	\$53.50	\$58.50	\$59.00	\$56.50	\$55.50	\$52.50	\$61.50	\$55.50	\$60.00	\$51.50	\$62.50	\$60.50	\$54.50	\$61.00	\$58.50
2039	\$57.50	\$53.50	\$58.50	\$59.00	\$56.50	\$55.50	\$52.50	\$61.50	\$55.50	\$60.00	\$51.50	\$62.50	\$60.50	\$54.50	\$61.00	\$58.50
2039+	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:

- Data sources include: EIA, OPEC, ARC Energy, Marex Spectron
- Venezuelan Merey replaced BCF-17 in the OPEC basket March 1, 2009.

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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									
2020	1.300	1.200	\$2.70	\$1.70	\$2.30	\$2.50	\$4.25	\$1.80	\$1.30
2021	1.300	1.200	\$2.70	\$1.70	\$2.30	\$2.50	\$4.60	\$2.50	\$1.30
2022	1.300	1.200	\$2.80	\$2.05	\$2.40	\$2.60	\$5.05	\$2.65	\$1.30
2023	1.300	1.200	\$2.90	\$2.15	\$2.50	\$2.70	\$5.15	\$2.85	\$1.30
2024	1.300	1.200	\$2.90	\$2.15	\$2.50	\$2.70	\$5.15	\$2.90	\$1.30
2025	1.300	1.200	\$2.90	\$2.15	\$2.50	\$2.70	\$5.15	\$2.90	\$1.30
2026	1.300	1.200	\$2.90	\$2.15	\$2.50	\$2.70	\$5.15	\$2.90	\$1.30
2027	1.300	1.200	\$2.90	\$2.15	\$2.50	\$2.70	\$5.15	\$2.90	\$1.30
2028	1.300	1.200	\$2.90	\$2.15	\$2.50	\$2.70	\$5.15	\$2.90	\$1.30
2029	1.300	1.200	\$2.90	\$2.15	\$2.50	\$2.70	\$5.15	\$2.90	\$1.30
2030	1.300	1.200	\$2.90	\$2.15	\$2.50	\$2.70	\$5.15	\$2.90	\$1.30
2031	1.300	1.200	\$2.90	\$2.15	\$2.50	\$2.70	\$5.15	\$2.90	\$1.30
2032	1.300	1.200	\$2.90	\$2.15	\$2.50	\$2.70	\$5.15	\$2.90	\$1.30
2033	1.300	1.200	\$2.90	\$2.15	\$2.50	\$2.70	\$5.15	\$2.90	\$1.30
2034	1.300	1.200	\$2.90	\$2.15	\$2.50	\$2.70	\$5.15	\$2.90	\$1.30
2035	1.300	1.200	\$2.90	\$2.15	\$2.50	\$2.70	\$5.15	\$2.90	\$1.30
2036	1.300	1.200	\$2.90	\$2.15	\$2.50	\$2.70	\$5.15	\$2.90	\$1.30
2037	1.300	1.200	\$2.90	\$2.15	\$2.50	\$2.70	\$5.15	\$2.90	\$1.30
2038	1.300	1.200	\$2.90	\$2.15	\$2.50	\$2.70	\$5.15	\$2.90	\$1.30
2039	1.300	1.200	\$2.90	\$2.15	\$2.50	\$2.70	\$5.15	\$2.90	\$1.30
2039+	1.250	1.130	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Notes:

- Data sources include: EIA, OPEC, ARC Energy, Marex Spectron
- Venezuelan Merey replaced BCF-17 in the OPEC basket March 1, 2009.

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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.

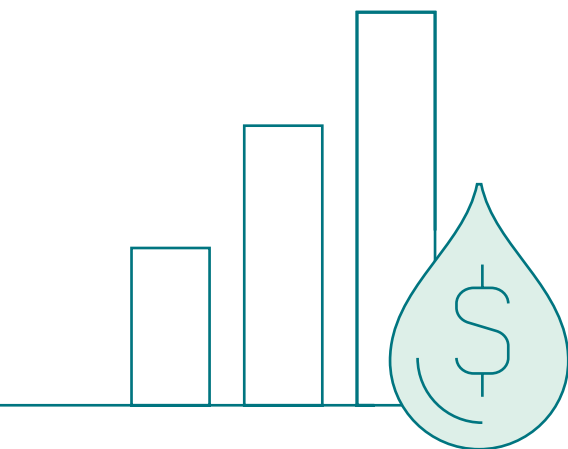
Our process

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 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.

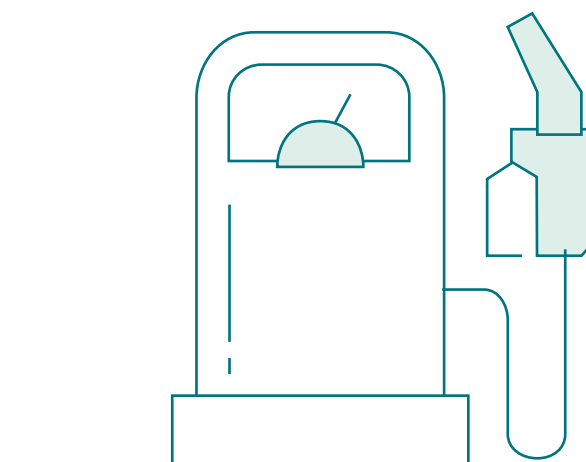
These forecasts are Deloitte's best estimate of how the future will look, and while they are considered reasonable, changing market conditions or additional information may require alteration from the indicated effective date.



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







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