

## ARC Energy Charts

Visit [www.arcenergyinstitute.com](http://www.arcenergyinstitute.com) for more information on this publication and the Institute

### Chart Watch

- 5 New COVID-19 cases rise, deaths remain low
- 27 Alberta production showed further drops in May
- 42 Western Canadian gas storage at 5-year avg
- 44 Cdn rigs have picked up off of record lows
- 48 Drilling in June was down over 90% from last yr

Spot WTI Crude \$US/B	Edmonton Light \$US/B	Spot Henry Hub \$US/MMBtu	Spot AECO \$Cdn/GJ	Spot AECO Basis \$US/MMBtu	Currency \$US/\$Cdn
40.63 ↑	36.11 ↑	1.61 ↑	1.62 ↓	0.35 ↑	0.7387 ↑

### 1 Broad Equity Markets

Daily Index Values; Rolling 12-Month History

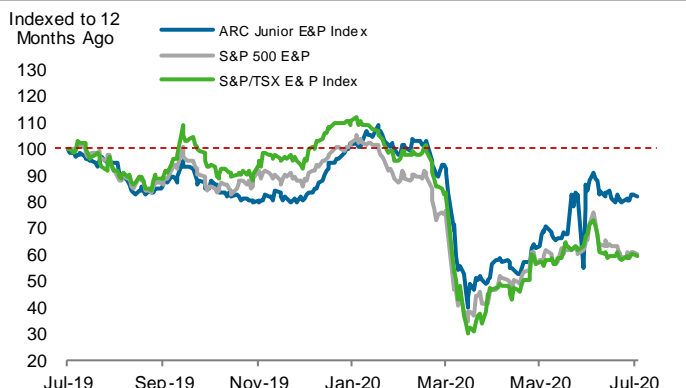


Broad market indices are one the many vital signs measuring the health of the economy. Energy demand is a function of economic health.

Source: Bloomberg, ARC Financial Corp.

### 2 Oil and Gas E&P Indices

Daily Index Values; Rolling 12-Month History

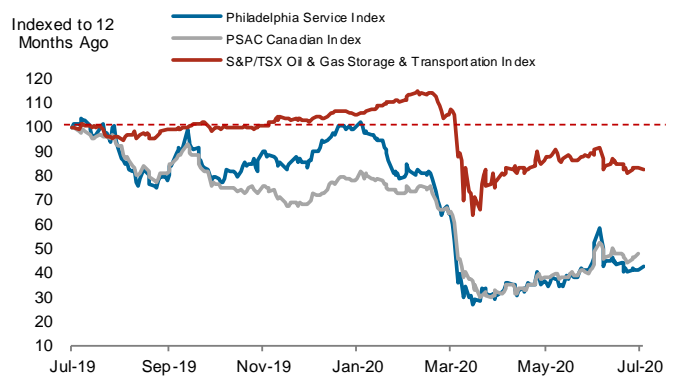


Performance of Canadian and US oil & gas equities are compared against each other.

Source: Bloomberg, ARC Financial Corp.

### 3 Oil & Gas Service and Midstream Indices

Daily Index Values; Rolling 12-Month History

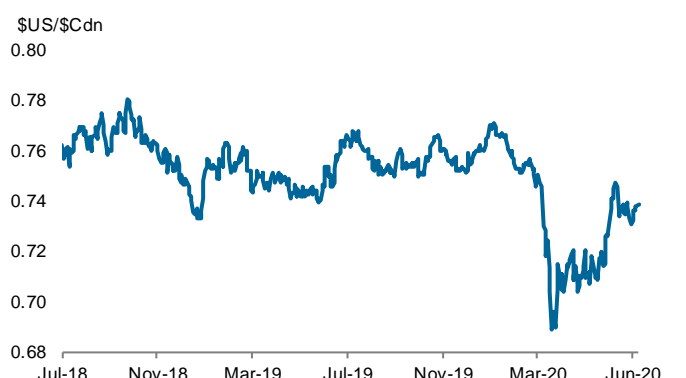


The performance of Canadian oil and gas service and midstream equities are plotted in tandem with the corresponding US Oilfield index.

Source: Bloomberg, Petroleum Services Association of Canada

### 4 Canadian Currency Exchange

Daily Close Values; Rolling 24-Month History

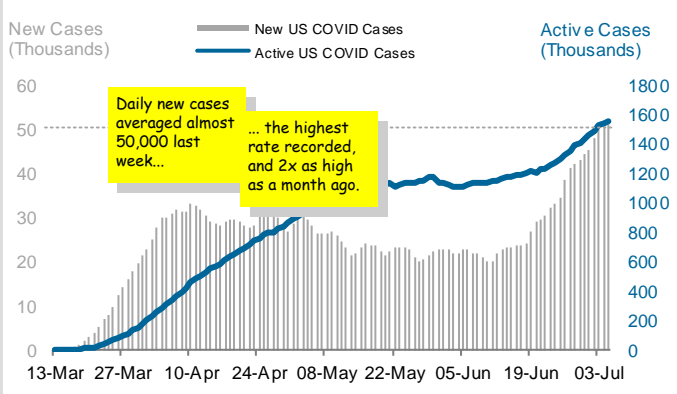


Much of Canada's oil and gas production is sold in US dollars. As such, the exchange rate significantly impacts corporate revenues and profits.

Source: Bloomberg

Please see **Advisories and Disclaimers** at the end of the publication for important cautionary advisory and disclaimer language

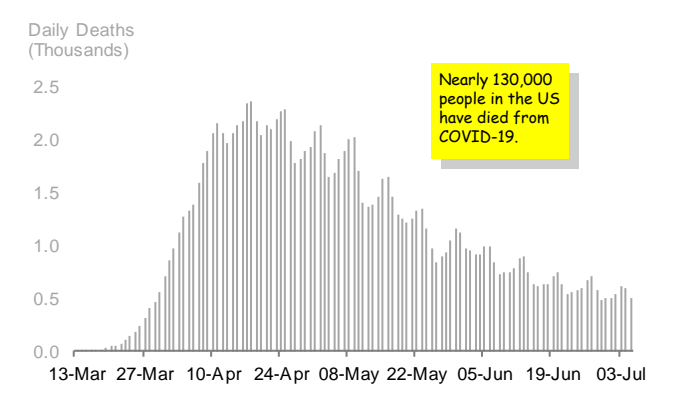
**5 United States: New and Active COVID-19 Cases**  
Daily (5-Day Rolling Average); March 9, 2020 to Current



Daily infection rates and active cases of COVID-19 will determine reopening and recovery of the world's largest economy.

Source: Worldometer

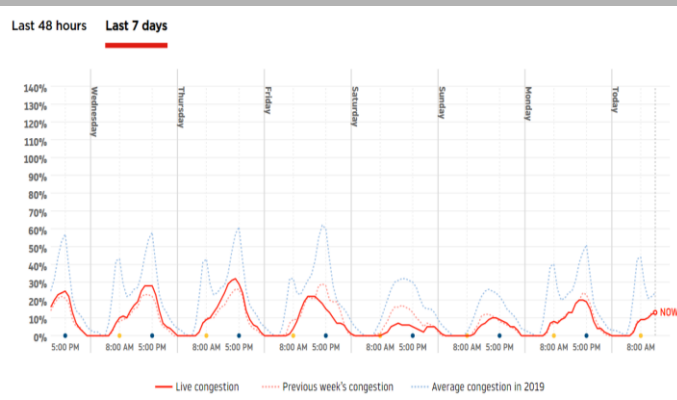
**6 United States: Daily New Deaths**  
Deaths per Day (5-Day Rolling Average): March 9, 2020 to Current



The growth rate of daily deaths is a useful statistic for tracking the progress of COVID-19 and predicting healthcare needs.

Source: Worldometer

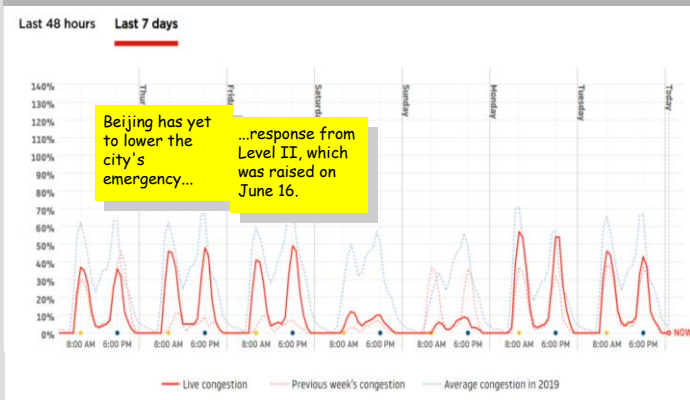
**7 TomTom Traffic Index: Chicago, U.S.**  
Congestion Level of Last 7 Days Compared with Year Prior



Traffic congestion levels show a real-time picture of the number of vehicles on the road; an indication of gasoline demand and economic recovery.

Source: TomTom International BV

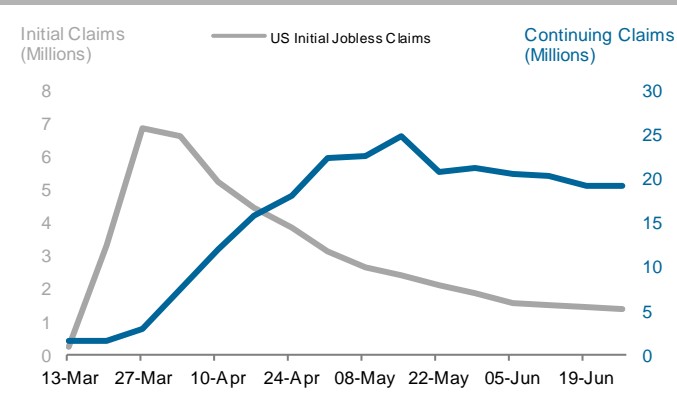
**8 TomTom Traffic Index: Beijing, China**  
Congestion Level of Last 7 Days Compared with Year Prior



Traffic congestion levels show a real-time picture of the number of vehicles on the road; an indication of gasoline demand and economic recovery.

Source: TomTom International BV

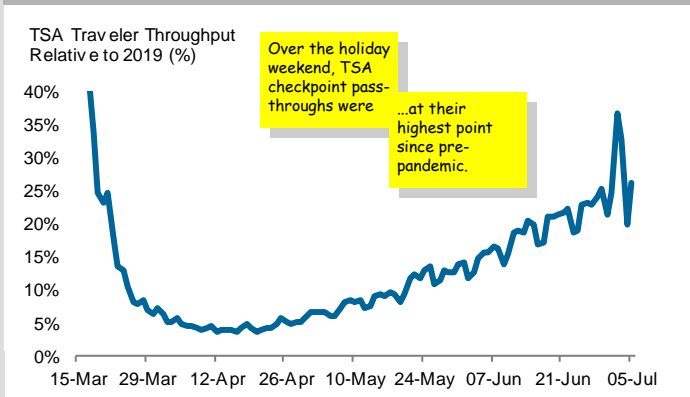
**9 U.S. Weekly Jobless Claims**  
Initial and Continuing Claims



Jobless claims are an important leading indicator on the state of the employment situation and the health of the economy.

Source: US Labor Department

**10 TSA Checkpoint Screening Numbers**  
Number of Travelers in 2020 as % of Same Period in 2019

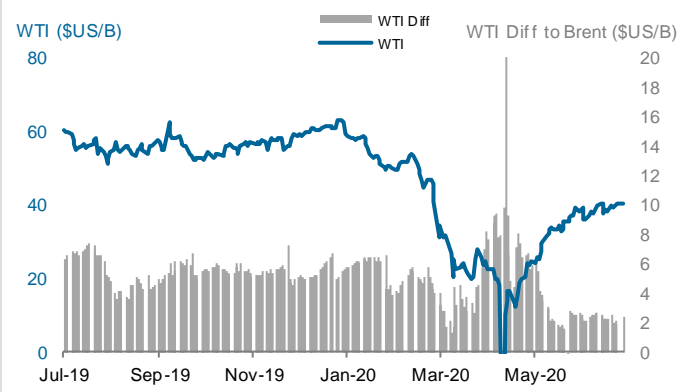


Monitoring the daily number of passengers screened at TSA checkpoints in the United States is a leading indicator of recovery in air travel.

Source: Transportation Security Administration

### 11 WTI Crude Oil Price and Differential to Brent

Near-Month WTI and Brent Differential; Rolling 12-Month History

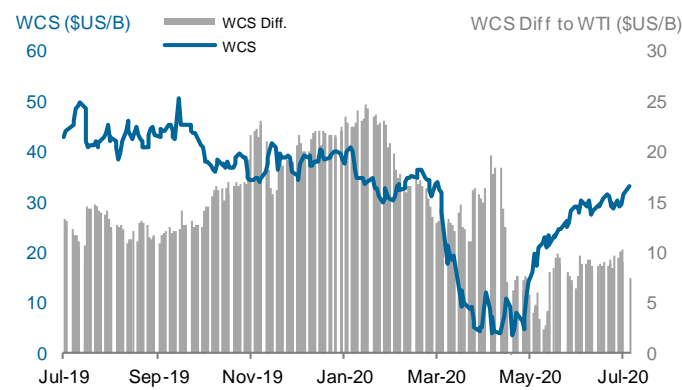


North American crude oil prices can sometimes disconnect from global prices depending on regional supply and demand dynamics.

Source: Bloomberg

### 13 Canadian Heavy Oil Price Differential to WTI

Western Canadian Select (WCS) Differential; Rolling 12-Month History

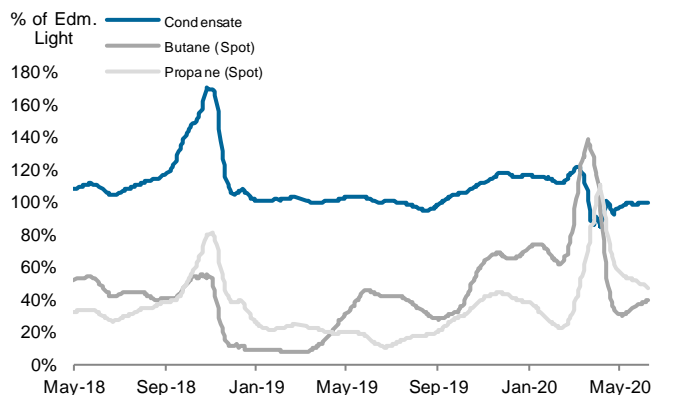


The differential should reflect quality differences and transportation costs. Greater discounts can result from infrastructure or refinery outages.

Source: Bloomberg

### 15 Daily NGL Prices as a % of Edmonton Light

NGL Prices at Edmonton, AB, 10 Day Rolling Average Shown

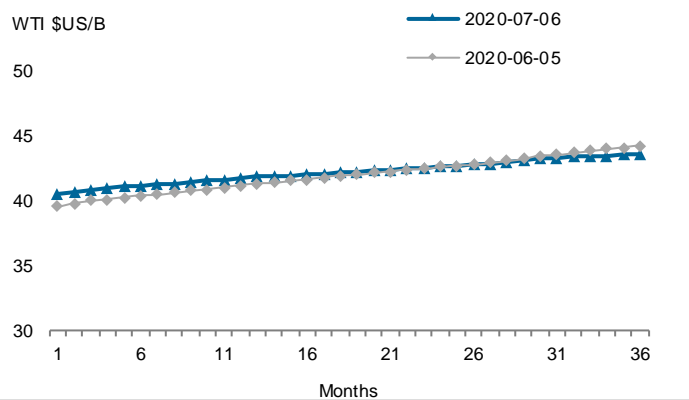


Natural gas liquids have become critical contributors to producer's cash flow. Prices are influenced by the price of oil as well as local supply and demand.

Source: Bloomberg, ARC Financial Corp.

### 12 US Crude Oil Futures

West Texas Intermediate (WTI), Next 36 Months

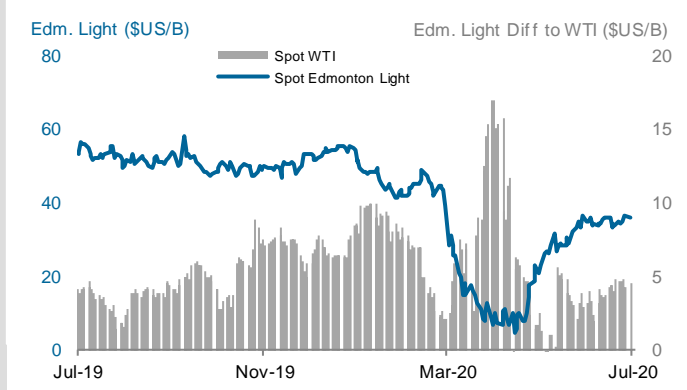


Forward prices for WTI are plotted for the next 36 contracts, and compared against the same contracts one month prior.

Source: Bloomberg

### 14 Canadian Light Crude Oil Price Differential to WTI

WTI and Edmonton Light differential; Rolling 12-Month History

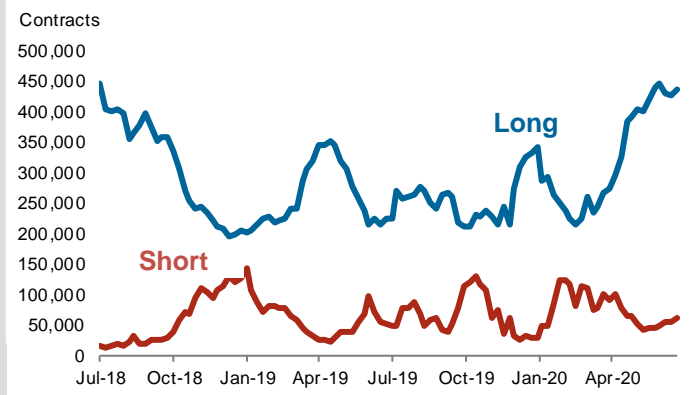


The differential should reflect the transportation cost from Alberta to Cushing. Greater discounts can result from infrastructure or refinery outages.

Source: Bloomberg

### 16 Long and Short Contracts - WTI

Managed Money - Futures

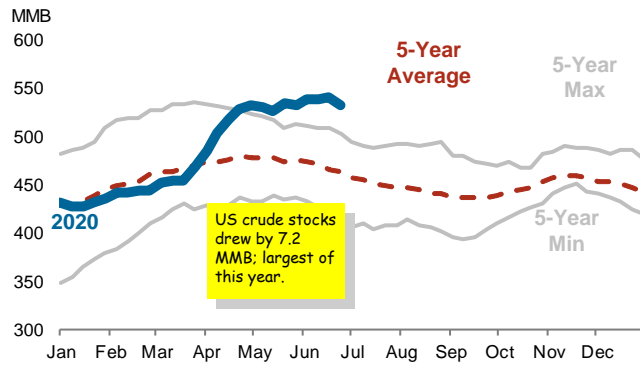


Long contracts take the position that WTI oil price will increase, while short contracts expect a decline.

Source: Bloomberg, U.S. Commodity Futures Trading Commission

#### 17 US Crude Oil Stocks

Historical Range and Current Year Levels

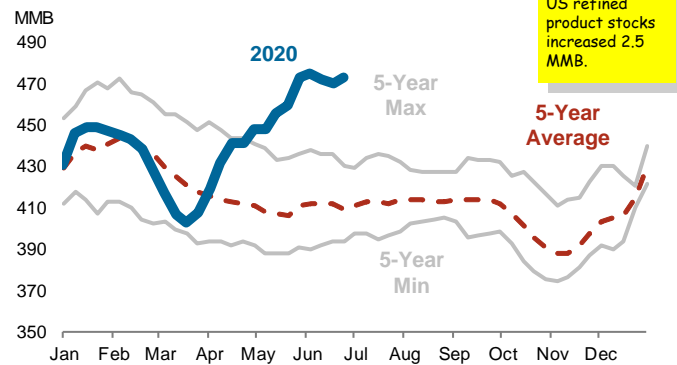


US crude oil stock levels can affect crude oil prices. Stock levels for the current year are represented by the blue line.

Source: U.S. Energy Information Administration

#### 18 US Refined Product Stocks

Historical Range and Current Year Levels

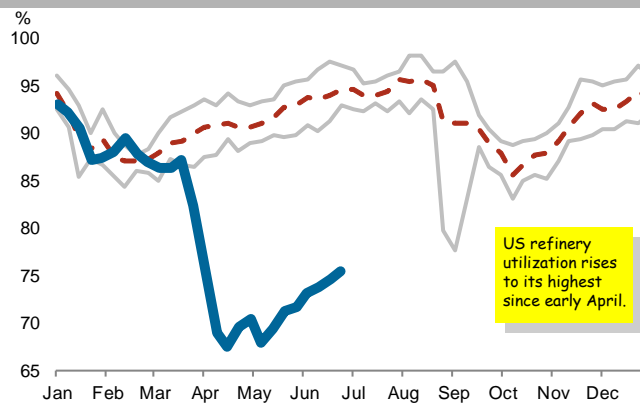


Total stocks of gasoline, diesel and jet fuel are shown. Stock levels for the current year are represented by the blue line.

Source: U.S. Energy Information Administration

#### 19 US Weekly Refinery Utilization Rates (%)

Historical Range and Current Year Levels

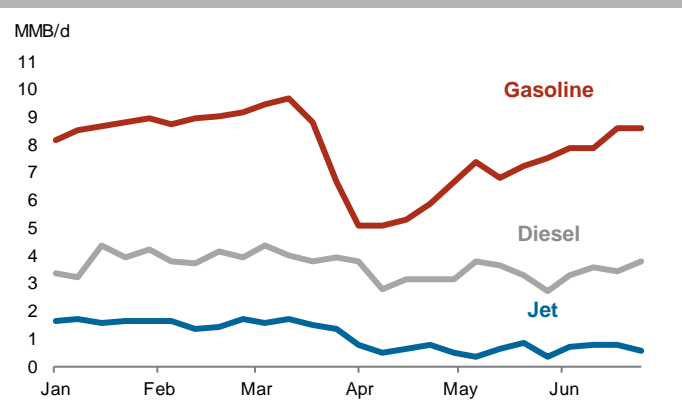


Refinery utilization rates change the supply of refined products, impacting price. Utilization for the current year is blue.

Source: U.S. Energy Information Administration

#### 20 US Petroleum Product Consumption

Top Three Product Categories; Year to Date

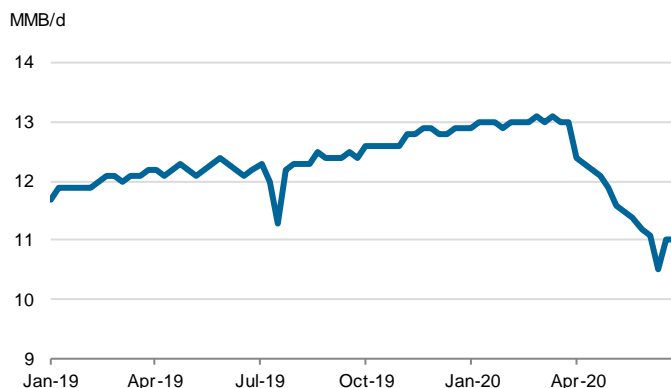


Gasoline, diesel and jet fuel consumption represent the majority of oil use in the US.

Source: U.S. Energy Information Administration

#### 21 US Weekly Crude Oil Production

US Field Production of Crude Oil; 2019 to Present

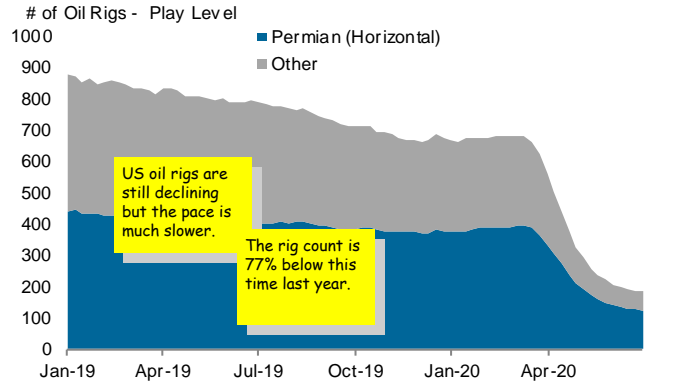


Weekly production is modelled by the EIA. It is less accurate than monthly reported numbers, but is instructive of up to date changes.

Source: U.S. Energy Information Administration

#### 22 US Oil Drilling Activity

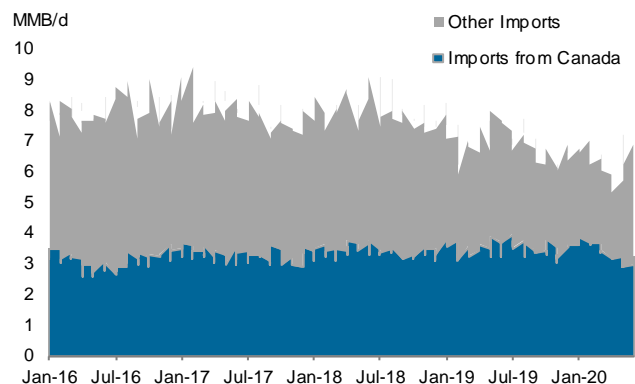
Baker Hughes Oil Rig Counts; 2019 to Present



Tracking US oil drilling by major play provides insight into the composition of US oil supply and growth trends.

Source: Baker Hughes

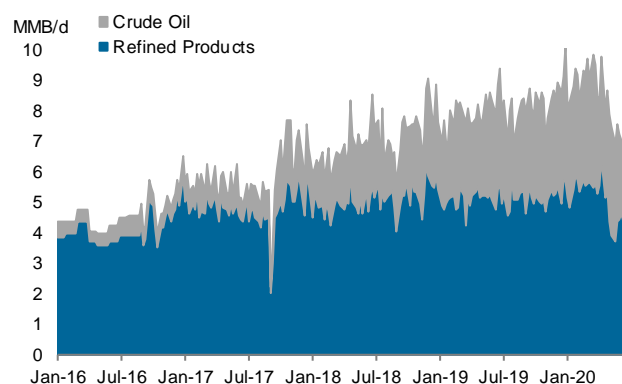
**23 US Crude Oil Imports**  
Weekly Data; 2016 to Present



Crude oil imports from Canada are taking market share from overseas imports.

Source: U.S. Energy Information Administration

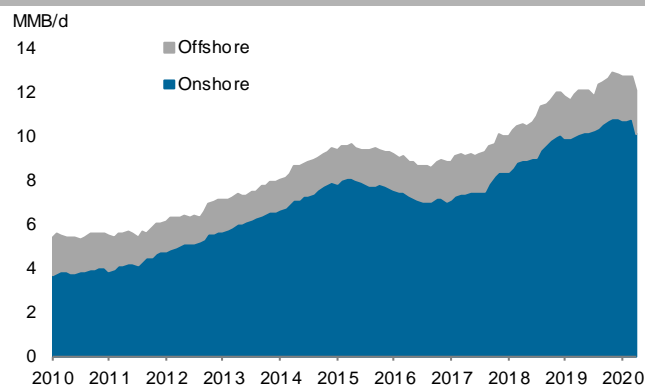
**24 US Exports of Crude Oil and Refined Products**  
Weekly Data; 2016 to Present



The US exports more refined products than crude oil. With the rapid growth of tight oil, most export growth should come from crude oil exports.

Source: U.S. Energy Information Administration

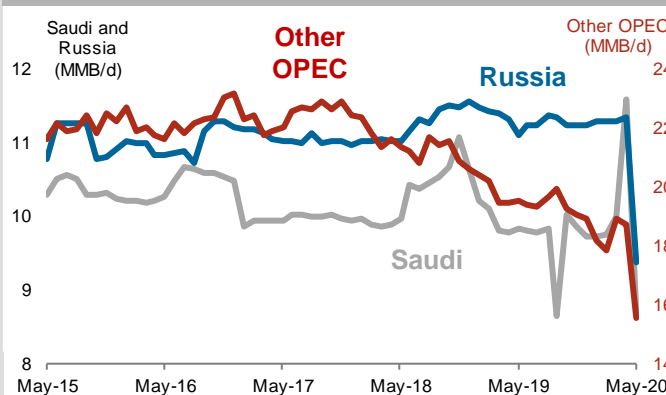
**25 Total US Oil Production**  
Monthly; 2010 to Present



The advancement of drilling and completion methods is increasing US crude oil production.

Source: Bloomberg, U.S. Energy Information Administration

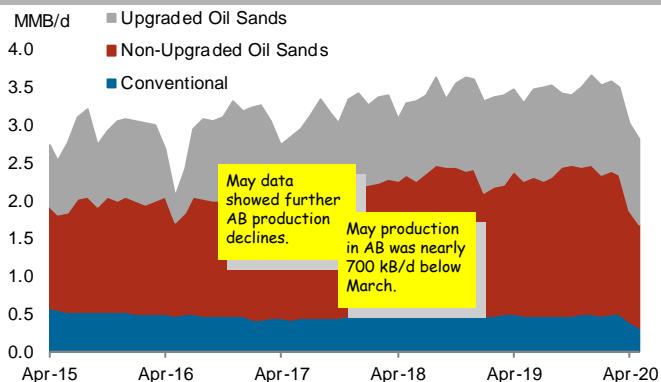
**26 OPEC and Russian Oil Production**  
Monthly; Rolling 60-Month History



OPEC's production levels relative to its sustainable and spare capacity influences global crude prices. Note: scale has been expanded.

Source: Petroleum Intelligence Weekly

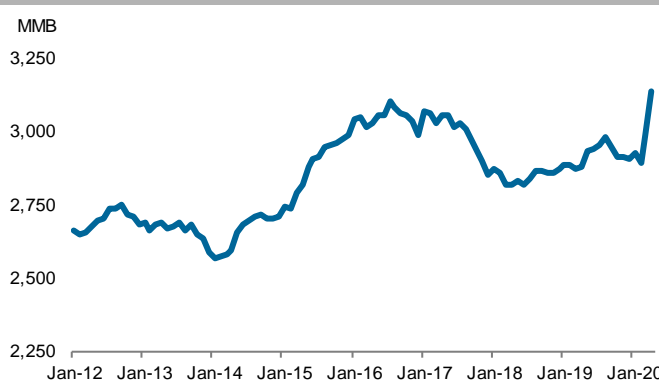
**27 Alberta Oil Production**  
Monthly; Conventional and Oil Sands



Most of Canada's oil production comes from Alberta; split between oil sands and conventional production.

Source: Alberta Energy Regulator

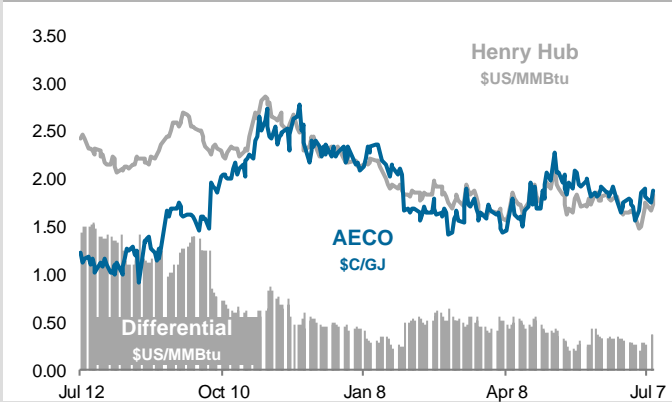
**28 OECD Total Industry Oil Stocks**  
Monthly; 2012 to Present



OECD stock levels can affect crude oil prices.

Source: International Energy Agency

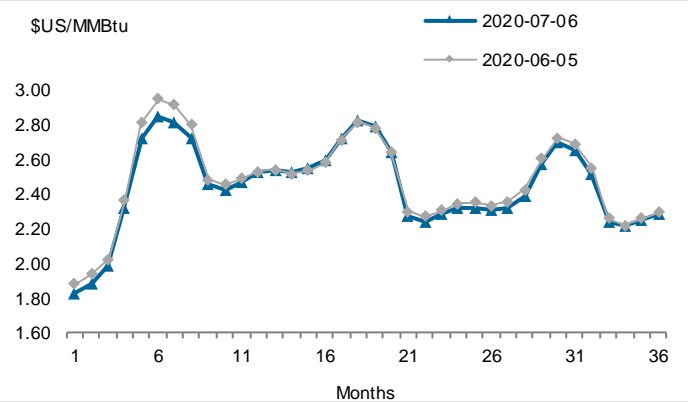
**29 Near-Month North American Natural Gas Prices**  
Daily Prices; Rolling 12-Month History



Near-month prices at AECO track Henry Hub prices, the exchange rate and the cost of transportation. Local factors can also affect price.

Source: Bloomberg

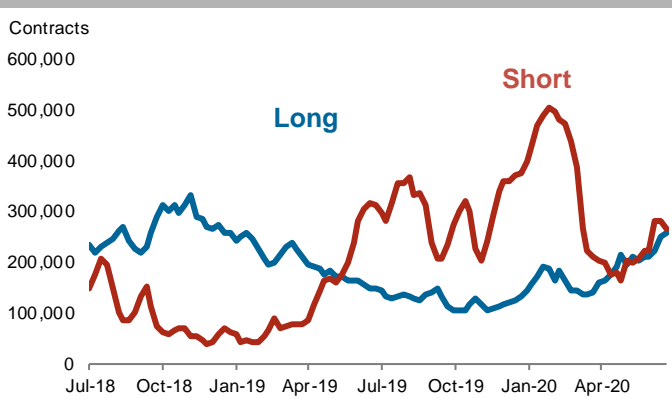
**30 US Natural Gas Futures**  
Nymex (Henry Hub) Next 36 Months



Forward contract prices are plotted for the next 36 months, and compared against the curve one month prior.

Source: Bloomberg

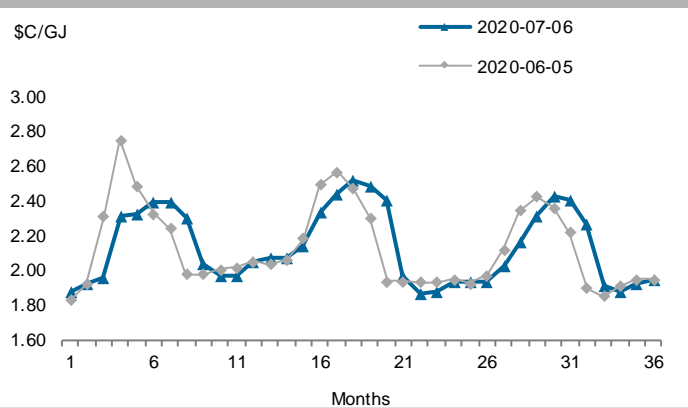
**31 Long and Short Contracts – Henry Hub**  
Managed Money - Futures



Long contracts take the position that Henry Hub gas price will increase, while short contracts expect a decline.

Source: U.S. Commodity Futures Trading Commission

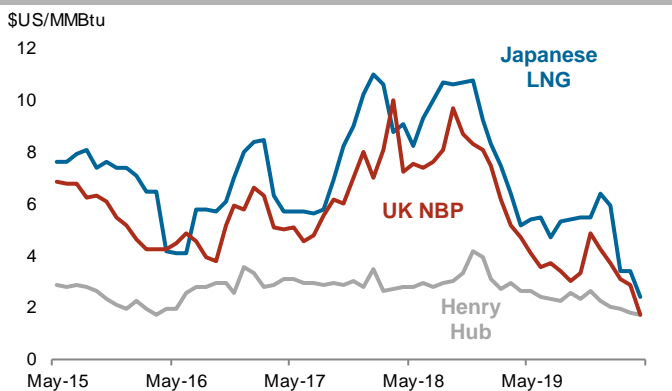
**32 Canadian Natural Gas Futures**  
AECO Hub (Bloomberg Estimate) Next 36 Months



AECO forward prices mimic Henry Hub futures minus a differential.

Source: Bloomberg

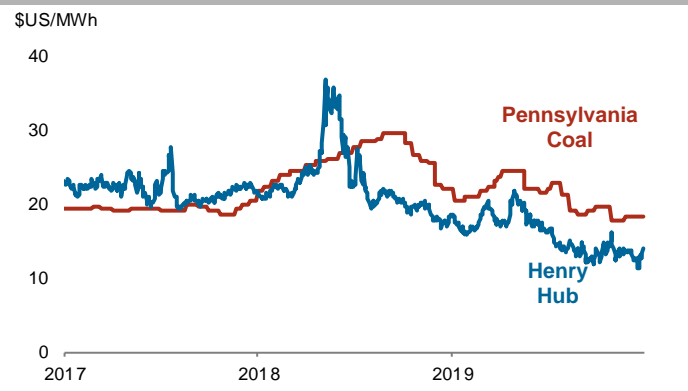
**33 Global Natural Gas Prices**  
Japanese LNG, UK NBP, Henry Hub; Average Monthly Prices



International natural gas prices strongly impact the economics of proposed LNG projects.

Source: Bloomberg, Japanese Ministry of Economy, Trade and Industry

**34 US Coal and Natural Gas Power Generation Cost**  
Converted to a \$/MWh Equivalent

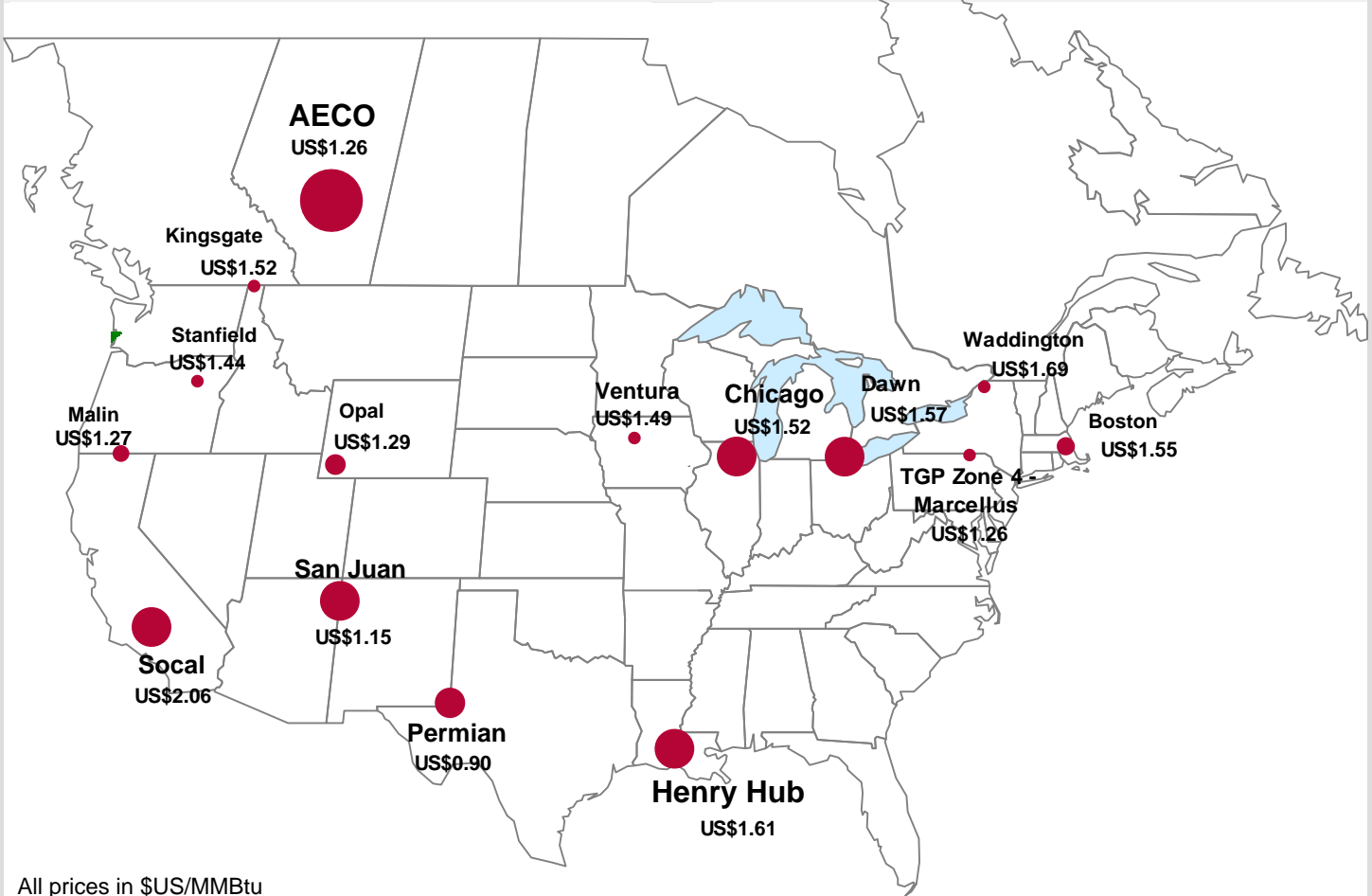


This graph illustrates when it may be economic to begin coal-gas switching in power generation. Average power plant efficiencies are assumed.

Source: Bloomberg

35

### Closing Spot Prices at North American Natural Gas Hubs Superimposed on Relative Physical Volumes Traded

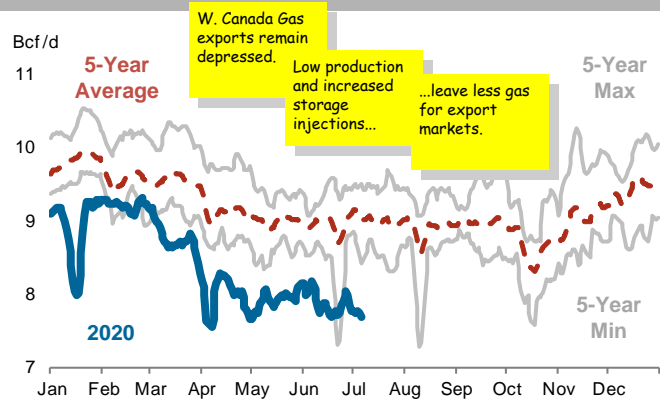


All prices in \$US/MMBtu

North America has an integrated natural gas market. Prices are determined by regional supply and demand, and pipeline flows.

Source: Bloomberg

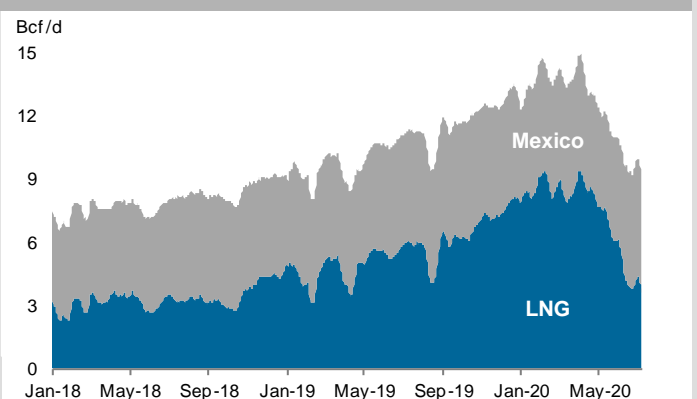
### 36 Pipeline Flows Out of Western Canada Daily; Historical Tracks and Current Year Levels



The ability of gas producers to move gas out of the WCSB to eastern markets and the US is a major factor in local natural gas prices.

Source: Various Pipeline Companies

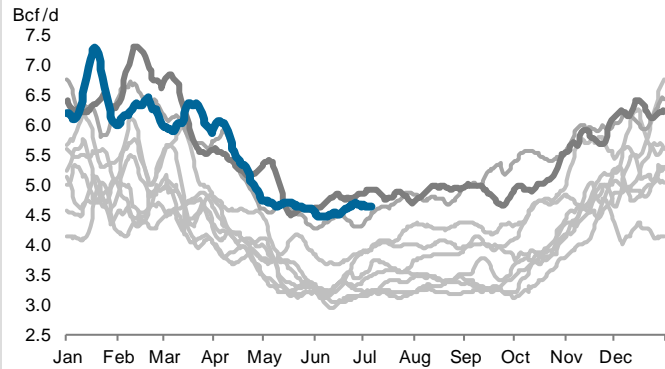
### 37 US Natural Gas Exports – Excluding Canada Daily; Historical Tracks and Current Year Levels



Between exports to Mexico and LNG shipments, the US is growing as a natural gas exporter. Robust US supply growth has driven this trend.

Source: Bentek

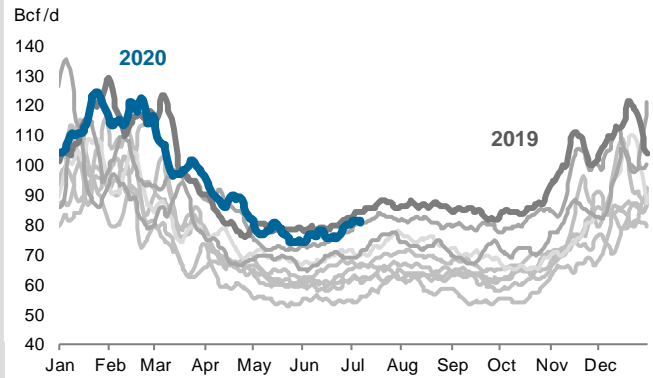
**38 Alberta Natural Gas Demand**  
TransCanada Intra-AB Deliveries; Current Year and Historical Tracks



Alberta natural gas demand has grown steadily in recent years, largely driven by new oil sands demand and power generation projects.

Source: TransCanada Pipelines

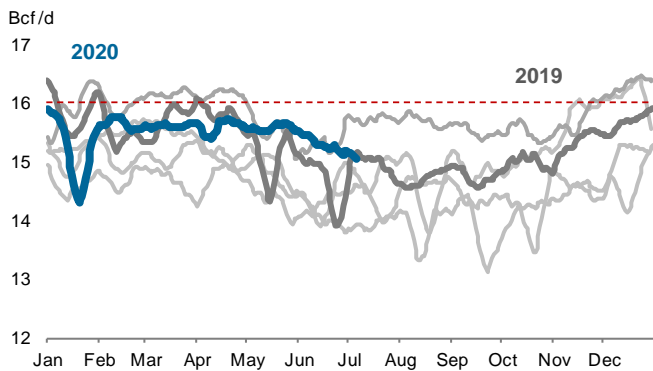
**39 US Total Natural Gas Demand**  
Daily; Historical Tracks and Current Year Levels



Total US demand fluctuates in the summer and during the winter as weather is an important driver of consumption.

Source: Bentek

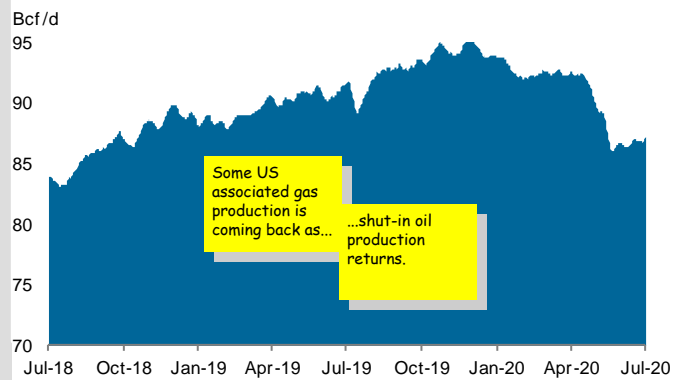
**40 Daily Western Canadian Production**  
Estimated Using Major Pipeline Receipts



This includes receipts on the TCPL, Alliance, WestCoast and TransGas pipelines.

Source: Various Pipeline Companies

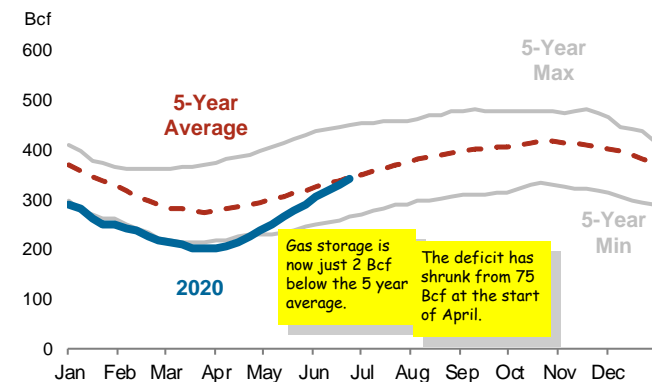
**41 Total US Dry Natural Gas Production**  
Daily; Rolling 24 Months



US production started ramping up in late 2007 and continues to grow year over year.

Source: Bentek

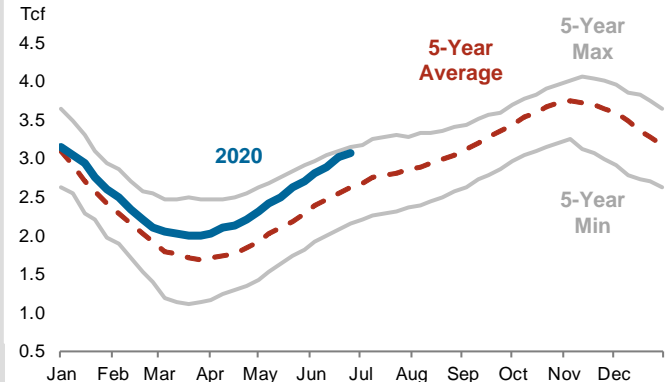
**42 Western Canadian Natural Gas Storage Levels**  
Weekly; Current Year and Historic Tracks



Canada's natural gas storage level provides a good metric if the country is well stocked. Abnormally high or low storage can affect the basis.

Source: Bloomberg

**43 Total Working Natural Gas in US Storage**  
Historical Range and Current Year Levels



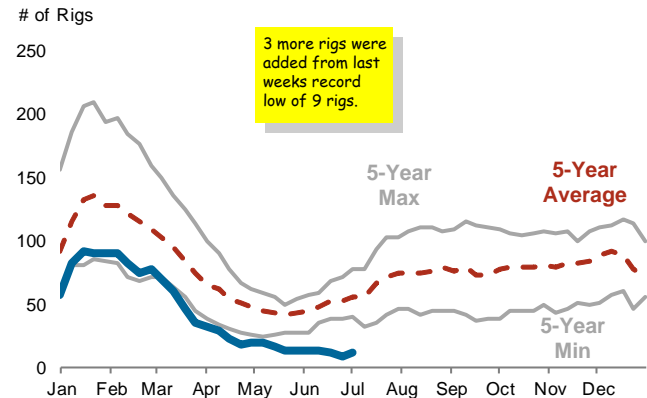
The EIA reports changes in US natural gas inventories held in underground storage facilities on a weekly basis.

Source: U.S. Energy Information Administration



#### 44 Canada: Weekly Gas Drilling Activity

Baker Hughes Drilling Rig Count; Current Year and Historical Range

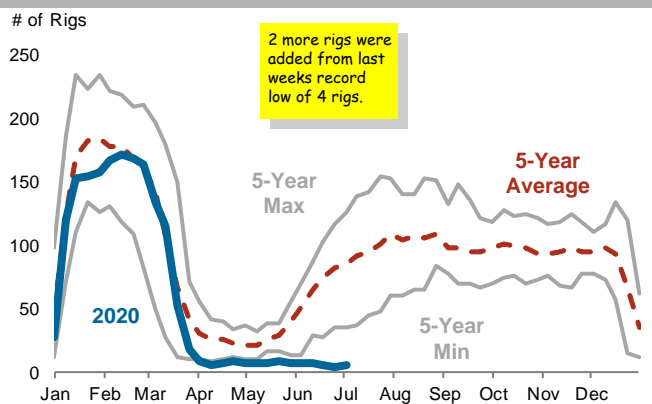


Unlike US drilling activity, Canadian rigs are dispatched seasonally. Capital allocation by operators is driven by views of future oil and gas prices.

Source: Baker Hughes

#### 46 Canada: Weekly Oil Drilling Activity

Baker Hughes Drilling Rig Count; Current Year and Historical Range

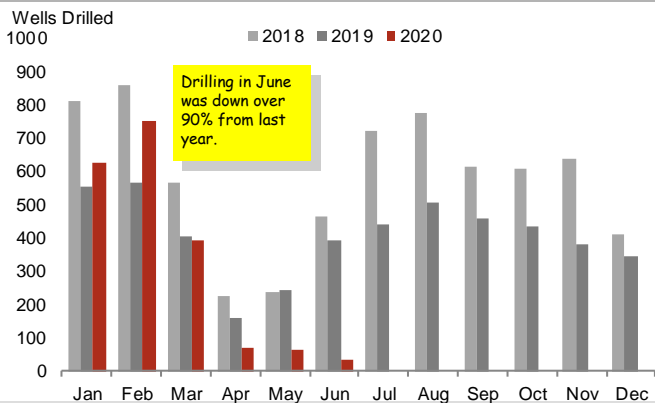


Unlike US drilling activity, Canadian rigs are dispatched seasonally. Capital allocation by operators is driven by views of future oil and gas prices.

Source: Baker Hughes

#### 48 Canada: Monthly Wells Drilled

Current Year vs Years Prior

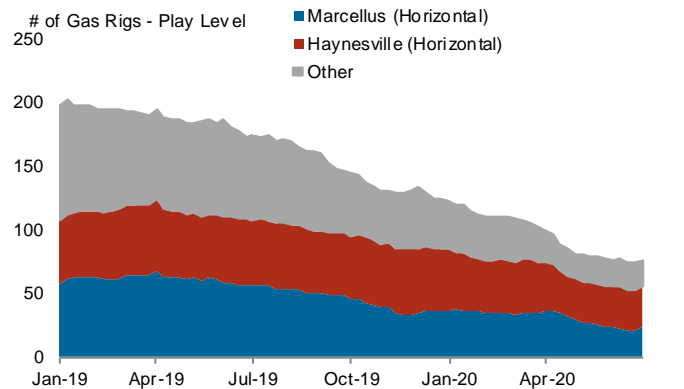


Total rig-releases for exploratory and development wells are highlighted in this chart. Rig releases for the current year are shown in red.

Source: Daily Oil Bulletin/JWN

#### 45 United States: Weekly Gas Drilling Activity

Baker Hughes Gas Rig Counts; 2019 to Present

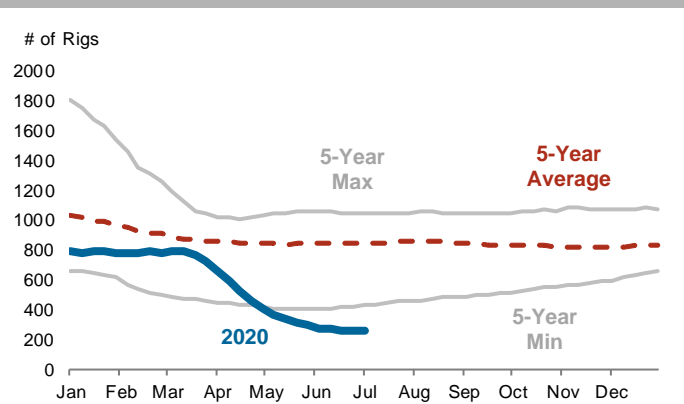


Tracking US gas drilling by major play provides insight into the composition of US gas supply and growth trends.

Source: Baker Hughes

#### 47 United States: Weekly Oil & Gas Drilling Activity

Baker Hughes Drilling Rig Count; Current Year and Historical Range

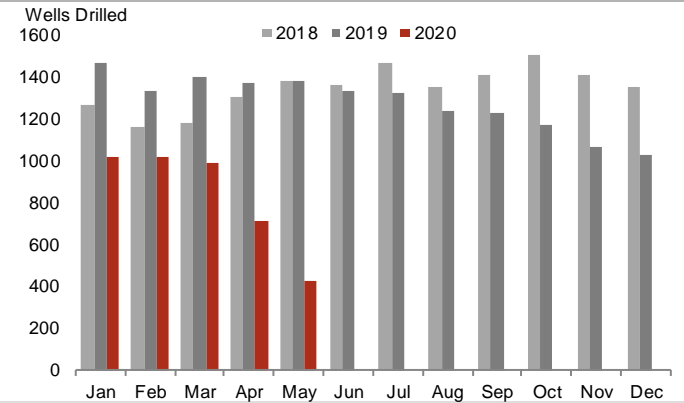


Tracking total US rigs provides insight into oil field services demand and total industry activity.

Source: Baker Hughes

#### 49 United States: Monthly Wells Drilled

Current Year vs Years Prior



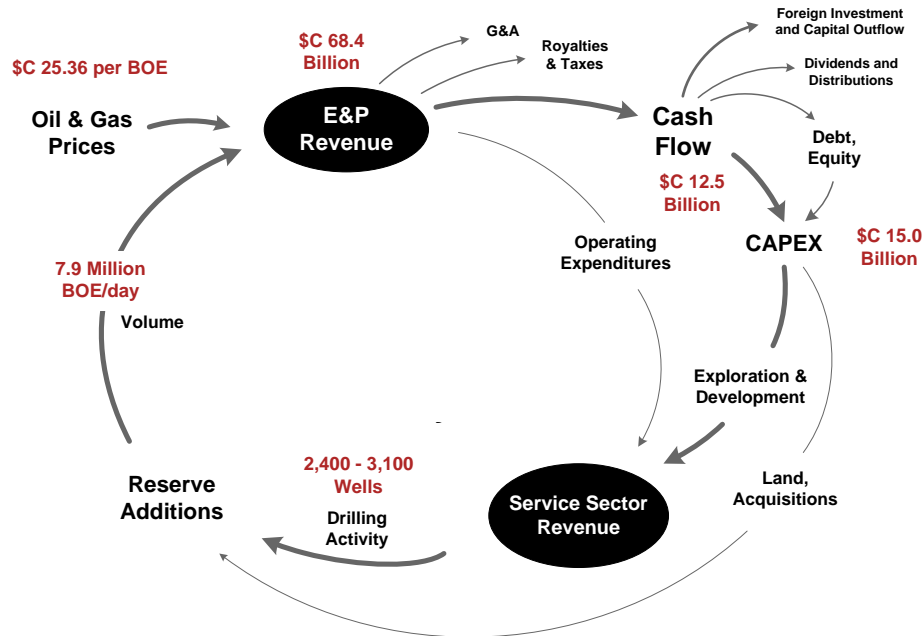
Total wells drilled in US Drilling Productivity Report regions are shown. These are the most active onshore US plays.

Source: EIA

### Estimated Capital Flow in the Canadian Oil and Gas Economy for 2020

Industry Revenue, Cash Flow, Reinvestment, Drilling Activity and Production

We are now showing 2020 metrics.  
Given current uncertainty these are likely to change.



50

### Canadian Industry Statistics: Historical Data and Forecast

#### Canadian Industry Metrics

	Price			Production Volume				Capital Inflow		Reinvestment			Drilling		Well Split	
	Average Price	Edmonton Par	AECO	Conv. Liquids	Bitumen + Synthetic	Natural Gas	Total Volume	Total Revenue	After-tax Cash Flow	Conv. Oil and Gas	Oilsands	Reinvest Ratio	Wells Compl.	Avg Rig Utiliz.	Oil Wells	Gas Wells
	\$/BOE	\$/B	\$/GJ	Average MBOE/d	Average MBOE/d	MBOE/d (@ 6:1)	MBOE/d (@ 6:1)	\$/ millions	\$/ millions	\$/ millions	\$/ millions	x:1	# / Year	%	%	%
2010	48.41	77.55	3.79	1830	1403	2,434	5,668	101,056	43,569	35,666	17,195	1.16	12,119	41%	56%	40%
2011	55.32	95.24	3.44	1873	1482	2,386	5,740	115,890	53,448	40,139	22,491	1.10	12,827	52%	69%	31%
2012	50.60	86.38	2.27	1905	1,743	2,327	5,975	111,389	48,908	39,733	27,199	1.37	11,067	44%	83%	17%
2013	55.95	93.47	3.02	2,023	1,940	2,343	6,306	128,787	54,711	43,165	30,809	1.35	11,071	42%	84%	16%
2014	60.69	95.07	4.23	2,085	1,964	2,480	6,530	144,660	66,977	46,872	33,868	1.21	11,222	45%	78%	22%
2015	37.34	57.63	2.56	1,995	2,381	2,531	6,907	94,127	29,985	31,609	22,929	1.82	5,382	24%	69%	31%
2016	32.61	53.09	2.06	2,013	2,421	2,564	6,998	83,298	23,701	23,040	15,426	1.62	4,060	17%	70%	30%
2017	39.18	62.42	2.10	2,119	2,674	2,605	7,398	105,788	45,031	28,712	13,803	0.94	7,076	30%	70%	30%
2018	39.57	69.24	1.46	2,292	2,913	2,737	7,942	114,705	48,322	27,374	11,661	0.81	6,927	32%	70%	30%
2019e	41.29	69.02	1.71	2,237	3,018	2,758	8,013	120,781	53,029	25,309	12,024	0.70	4,886	24%	70%	30%
2020e	25.36	42.23	2.08	1,786	2,895	2,703	7,384	68,363	12,522	9,011	6,012	1.20	N/A	24%	70%	30%

**Advisories and Disclaimers:** This document is provided for informational purposes only and none of the information contained herein is intended to provide, nor should be construed as, investment, financial, legal or other advice and should not be relied upon as such. Certain of the information and data contained herein has been obtained or prepared from publicly available documents and other sources prepared by third parties, and ARC has relied upon such information and data. ARC does not audit or independently verify such information and data and ARC makes no representations or warranties as to the accuracy or completeness of such information and data nor the conclusions derived therefrom. This document has been published on the basis that ARC shall not be responsible for, and ARC hereby expressly disclaims any responsibility or liability for, any financial or other losses or damages of any nature whatsoever arising from or otherwise relating to any use of this document.

Certain information contained herein may constitute forward-looking information and forward-looking statements" (collectively, "forward-looking statements") under the meaning of applicable Canadian securities laws. Forward-looking statements include estimates, plans, expectations, intentions, opinions, forecasts, projections, guidance or other statements that are not statements of fact, including but not limited to global and industry economic conditions and policies, production, demand and commodity prices. Although ARC believes that the assumptions underlying and expectations reflected in such forward-looking statements are reasonable, it can give no (and does not give any) assurance that such assumptions and expectations will prove to have been correct. Such forward-looking statements involve known and unknown risks, uncertainties and other factors outside of ARC's control that may cause actual results to differ materially from those expressed herein. Neither ARC nor any of its affiliates undertakes any obligation to publicly revise such forward-looking statements to reflect subsequent events or circumstances, except as required by law.