

Industry Note

Equity Research

November 24, 2021

Energy Producers

The Crude Facts

Weekly Oil Charts

TD Investment Conclusion

In the following charts, we summarize the key oil data-points for the global crude oil supply/demand outlook. We highlight the following weekly trends:

1) Mixed inventory report: The EIA reported a bearish, unexpected crude inventory build vs. consensus. However, the build was lower than yesterday's API data. On the other hand, gasoline and distillate inventories both saw bullish, higher-than-expected draws. U.S. Thanksgiving travel should further support refined product demand which already sits above the top-end of the five-year historical band (Exhibit 4).

2) U.S. to release 50 mmbbl from SPR to combat higher oil prices : The U.S. together with China, India, South Korea, Japan, and the U.K. are releasing 70-80 mmbbl of reserves in an attempt to cool oil prices while OPEC+ holds the line on the return of sidelined production (currently 400 mbb/d per month, but struggling to meet this). While WTI spot prices declined initially, they pared losses and currently trade at ~US\$78/bbl (would suggest announced SPR figures were broadly in line with market expectations).

3) Retail gasoline prices reached highest level in seven years: U.S. retail gasoline prices hit US\$3.27/gallon, the highest since Q4/14. However, wholesale gasoline prices (and consequently, U.S. crack spreads, Exhibit 8) have not moved up in tandem since the surge in retail prices is believed to be largely driven by an increase in blending, distribution, and marketing costs.

Exhibit 1. Weekly Summary

Crude Oil Pricing (US\$/bbl)	Last	Δ 1M	Δ 1Y
Brent - International	\$81.70	-2%	70%
WTI	\$78.29	-5%	72%
Ed. Light	\$76.34	-3%	91%
LLS	\$78.69	-5%	67%
WCS	\$58.59	-11%	69%
US Resource Play Production (mmbbl/d)	Last	Δ 1M	Δ 1Y
Total US	11.5	2%	6%
Lower 48	11.1	2%	5%
Eagle Ford	1.1	0%	0%
Permian	5.0	1%	14%
Bakken	1.1	0%	-5%
Niobrara	0.6	1%	6%
US Crude Inventories (mmbbl)	Last	Δ 1Y	Δ 5 Yr Avg
US Crude	434	-11%	-7%
US Gasoline	211	-8%	-6%
US Distillate	122	-15%	-7%
Total US Crude Oil Complex	767	-11%	-7%
US Crude Oil Demand (mmbbl/d)	Last	Δ 1Y	Δ 5 Yr Avg
US Total Refined Product Demand	21.8	14%	8%
US Gasoline Demand	9.3	15%	5%
US Distillate Demand	4.4	5%	9%
US Jet Fuel Demand	1.5	29%	-7%
Refining Crack Spreads (US\$/bbl) & Utilization	Last	Δ 1Y	Δ 5 Yr Avg
US Mid-continent 3-2-1 Crack Spread	\$12.64	94%	-7%
US Gulf Coast 3-2-1 Crack Spread	\$12.69	113%	22%
US NYH 3-2-1 Crack Spread	\$16.82	123%	34%
Refinery Utilization	89%	13%	-1%

Source: Bloomberg, TD Securities Inc.

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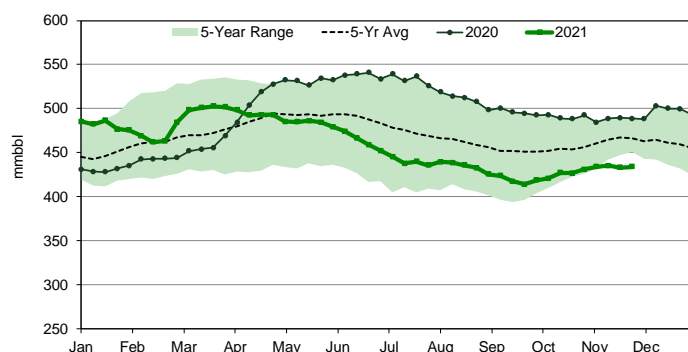
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Exhibit 2. United States Oil and Oil Product Inventories

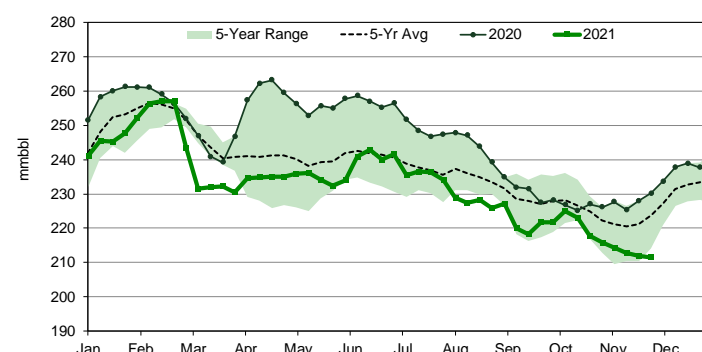
DOE Crude Oil Inventories - Period Ending Nov 19, 2021

DOE United States Crude Oil Inventories

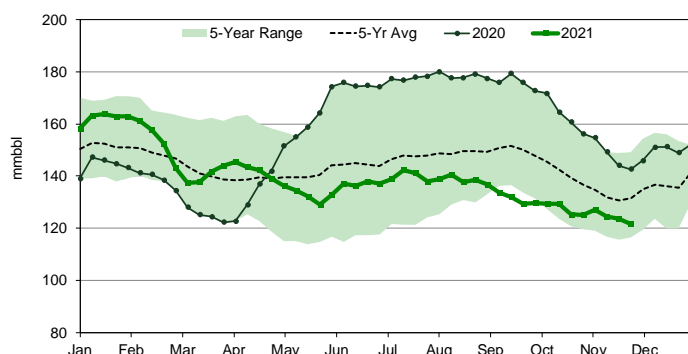
US Crude Oil Inventories



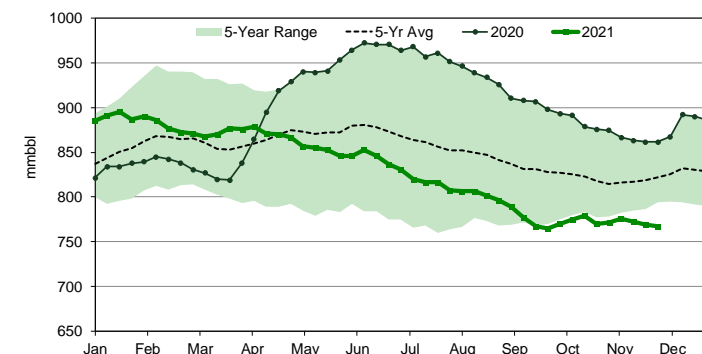
US Gasoline Inventories



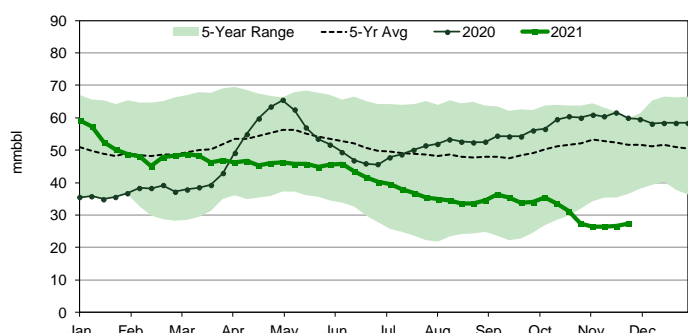
US Distillate Inventories



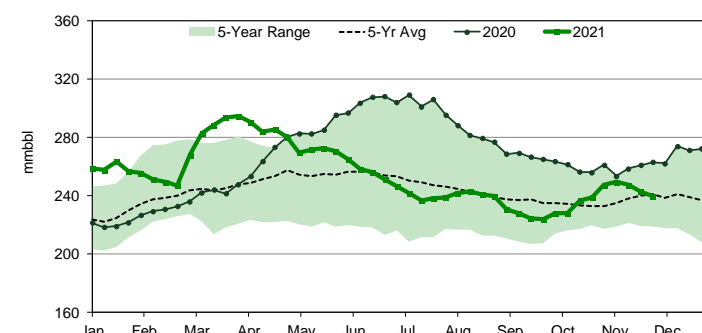
US Total Crude Complex Inventories



DOE Cushing Crude Inventory



DOE Gulf Coast (PADD 3) Inventory



Source: Bloomberg, TD Securities Inc.

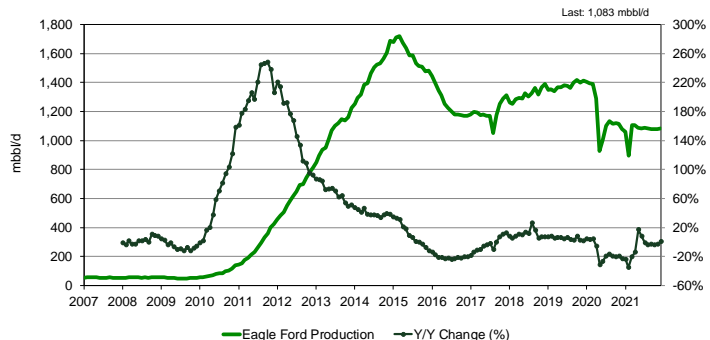
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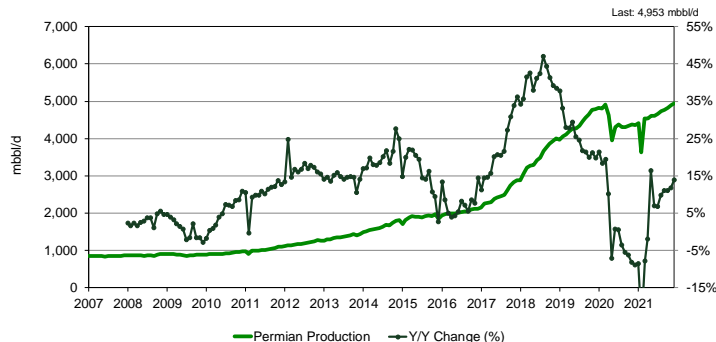
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Exhibit 3. Key Drivers of North American Supply Growth

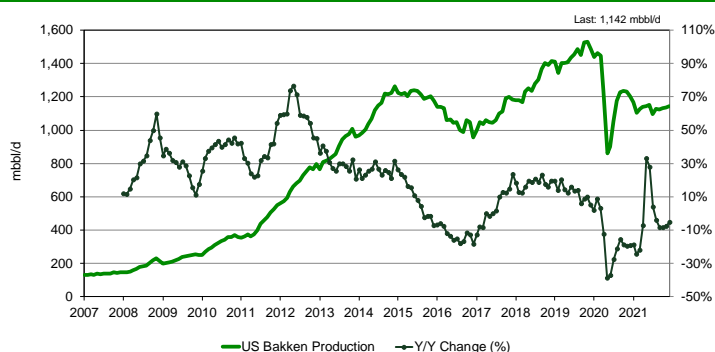
EAGLE FORD - Crude Oil Production



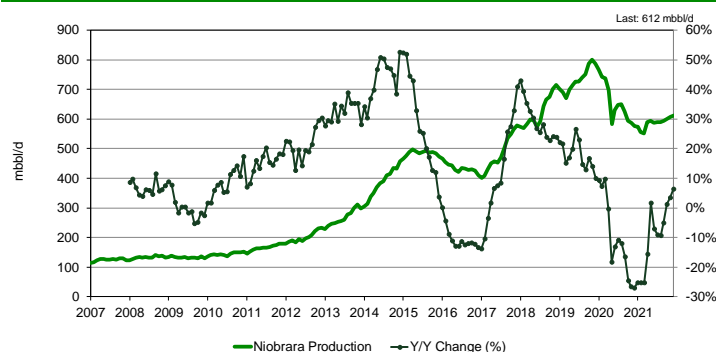
PERMIAN - Crude Oil Production



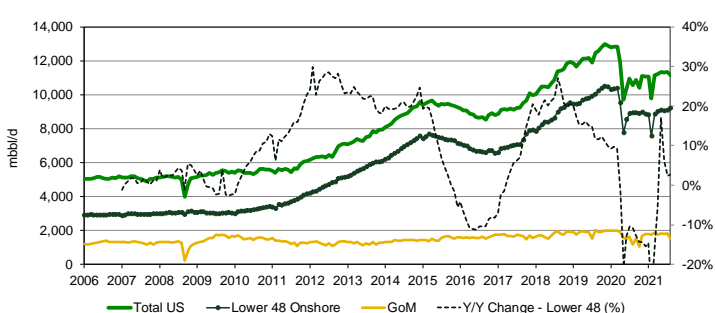
US BAKKEN - Crude Oil Production



NIORRARA - Crude Oil Production

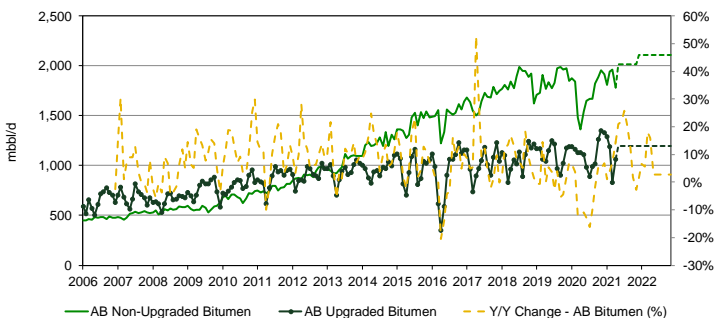


US Crude Oil Production

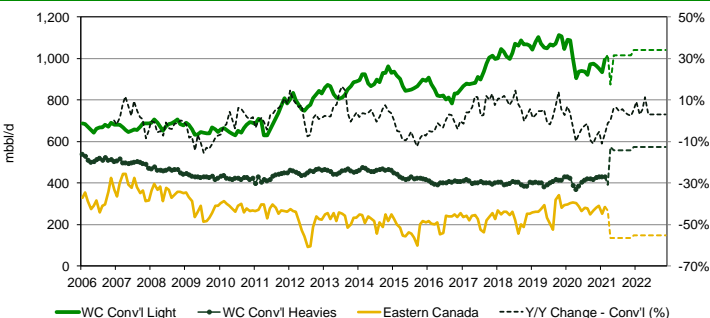


* Data is delayed by three months. For current production data see Exhibit 1.

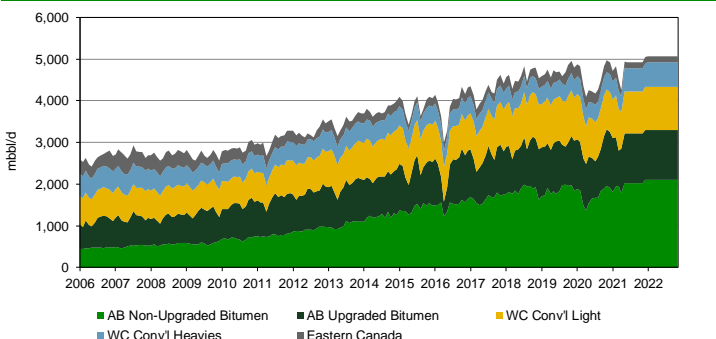
Alberta Oil Sands Production



Canadian Conventional and Offshore Crude Oil Production



Canadian Crude Oil Production



* CER stopped publishing monthly actuals/forecasts from March 2021. We show CER's 2021/2022 annual estimates here to provide a near-term outlook for Canadian oil production.

Source: Bloomberg, CER, TD Securities Inc.

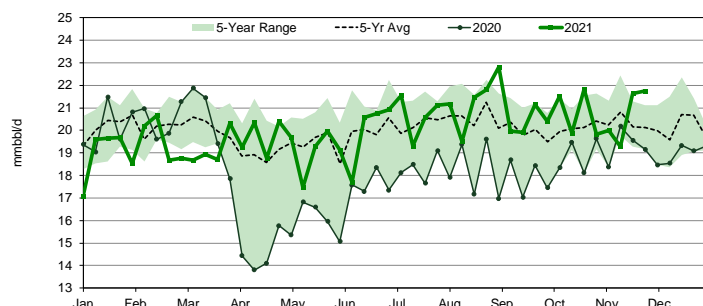
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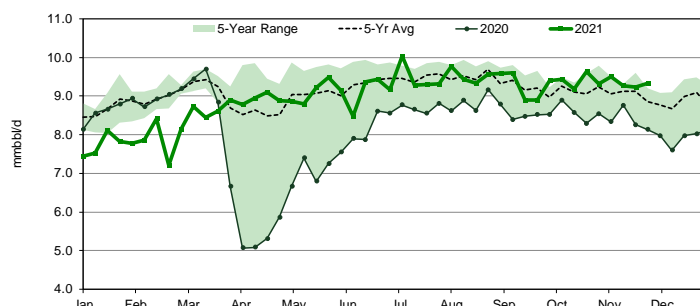
Exhibit 4. United States Oil and Oil Product Demand

US Total Refined Product Demand



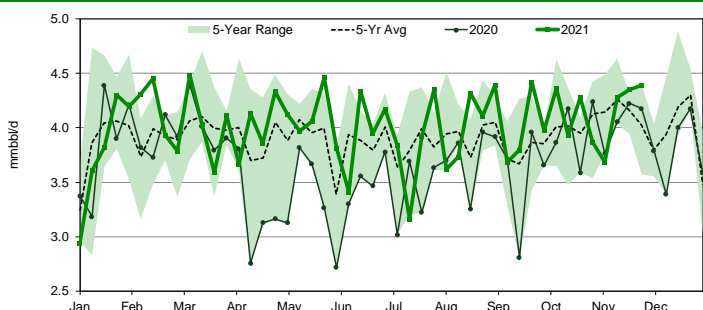
mmbbl/d	Last	Δ 1Y	Δ 5Y Avg
US Total Refined Products Demand	21.8	13.6%	8.1%

US Gasoline Demand



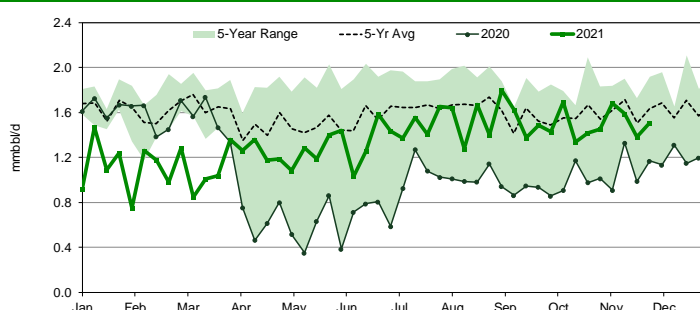
mmbbl/d	Last	Δ 1Y	Δ 5Y Avg
US Gasoline Demand	9.3	14.8%	5.4%

US Distillate Demand



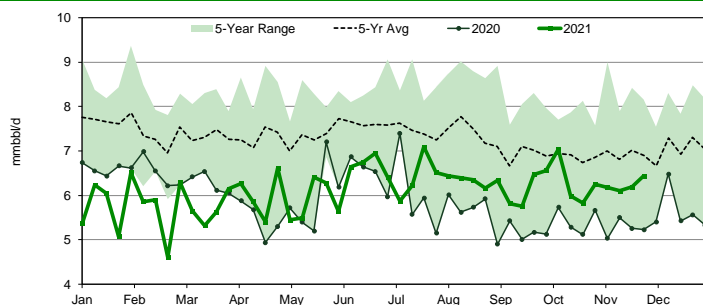
mmbbl/d	Last	Δ 1Y	Δ 5Y Avg
US Distillate Demand	4.4	5%	9.0%

US Jet Fuel Demand



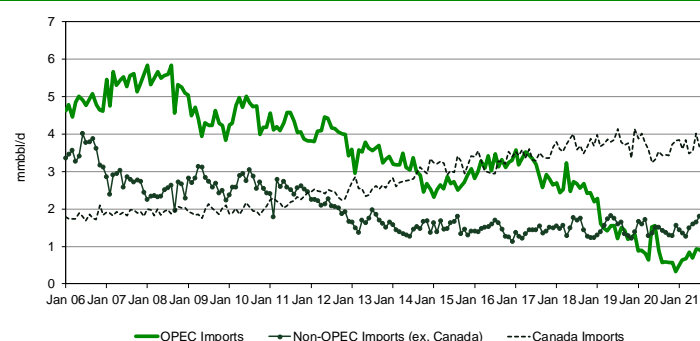
mmbbl/d	Last	Δ 1Y	Δ 5Y Avg
US Jet Fuel Demand	1.5	29.2%	-7.5%

US Weekly Crude Imports (incl. Strategic Petroleum Reserve)

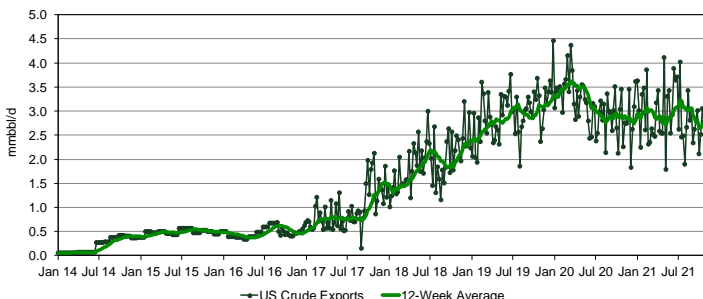


mmbbl/d	Last	Δ 1Y	Δ 5Y Avg
US Crude Imports (incl SPR)	6.4	23%	-7%

US Monthly Crude Oil Imports - Historical

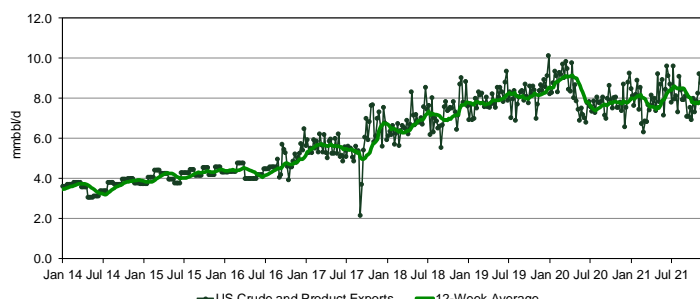


US Crude Oil Exports



mmbbl/d	Last	Δ 1Y	Δ 5Y Avg
US Crude Oil Exports	2.6	-8%	22%

Total US Crude and Product Exports



mmbbl/d	Last	Δ 1Y	Δ 5Y Avg
Total US Crude and Product Exports	7.5	1%	2%

Source: Bloomberg, TD Securities Inc.

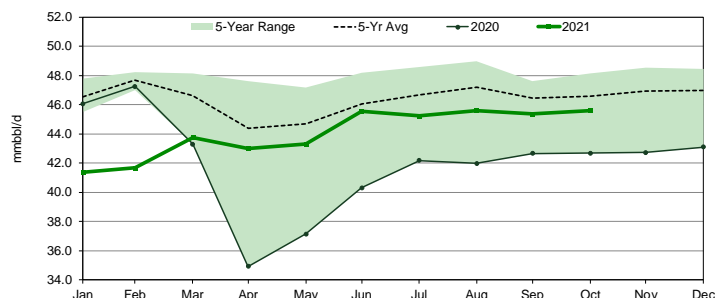
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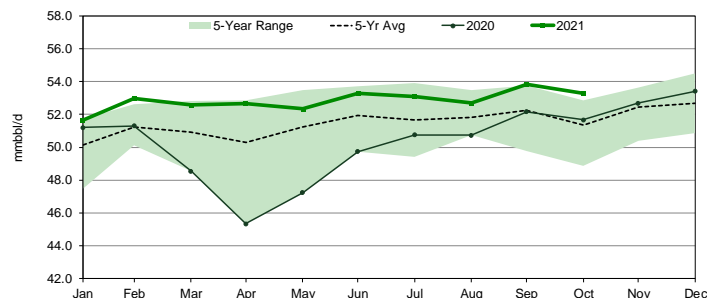
Exhibit 5. International Oil and Oil Product Demand

OECD Total Crude Products Demand



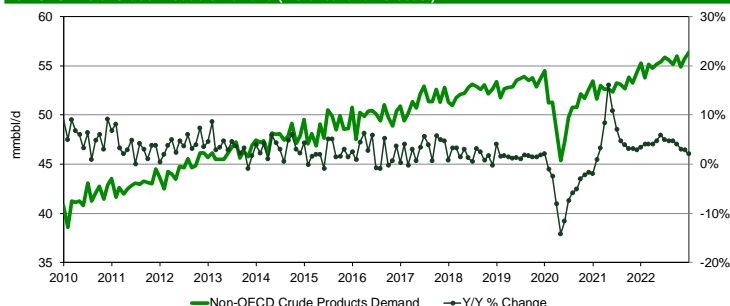
mmbbl/d	Last	Δ 1Y	Δ 5Y Avg
OECD Total Products Demand	45.6	6.8%	-2.1%

Non-OECD Total Crude Products Demand



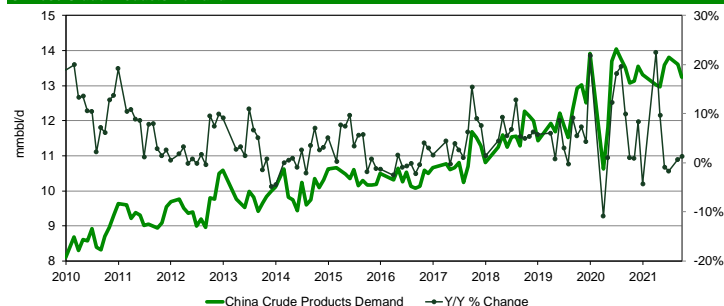
mmbbl/d	Last	Δ 1Y	Δ 5Y Avg
Non-OECD Total Crude Products Demand	53.3	3.1%	3.7%

Non-OECD Total Crude Products Demand (Historical and Forecast)



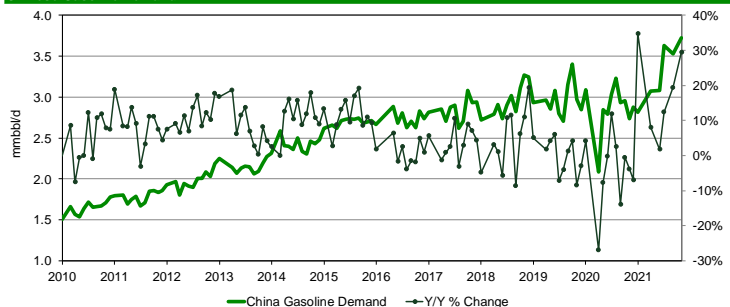
mmbbl/d	Last	Δ 1Y	Δ 5Y Avg
Non-OECD Total Crude Products Demand	53.3	3.1%	3.7%

Chinese Crude Products Demand



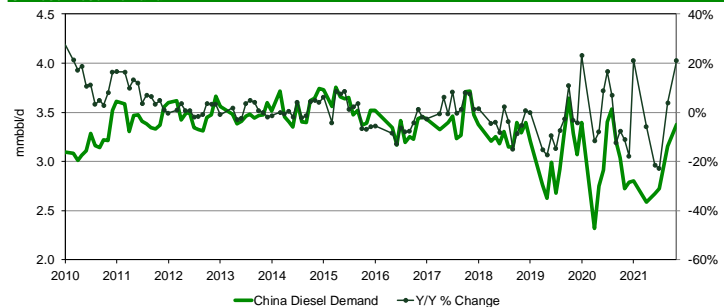
mmbbl/d	Last	Δ 1Y	Δ 5Y Avg
Chinese Total Products Demand	#N/A	#N/A	#N/A

Chinese Gasoline Demand



mmbbl/d	Last	Δ 1Y	Δ 5Y Avg
Chinese Gasoline Demand	3.7	35.8%	26%

Chinese Diesel Demand



mmbbl/d	Last	Δ 1Y	Δ 5Y Avg
Chinese Diesel Demand	3.4	24.0%	2.7%

Source: Bloomberg, TD Securities Inc.

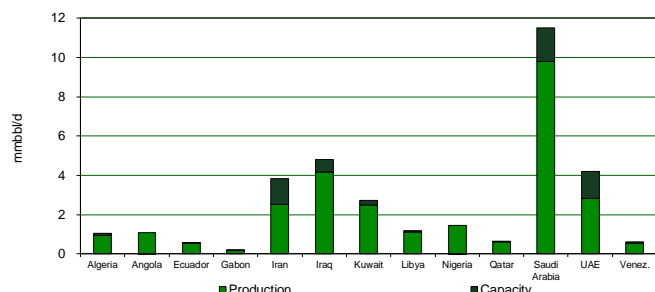
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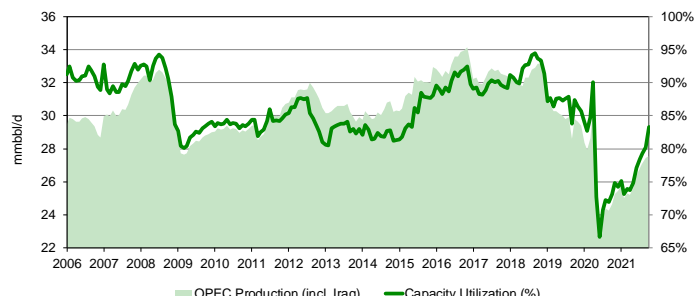
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Exhibit 6. Global Supply Outlook

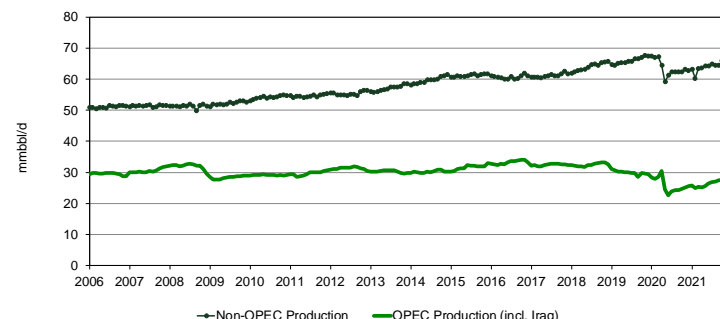
OPEC Production and Excess Capacity



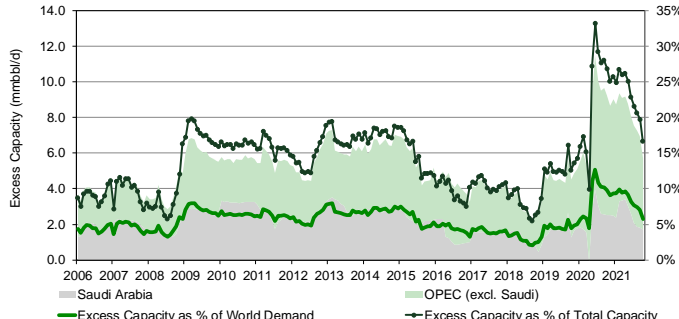
OPEC Utilization



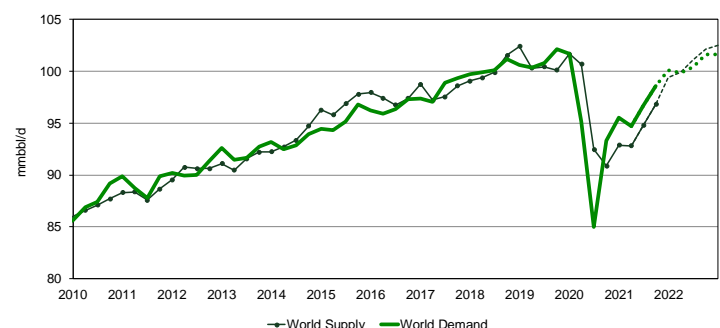
OPEC vs. non-OPEC Production



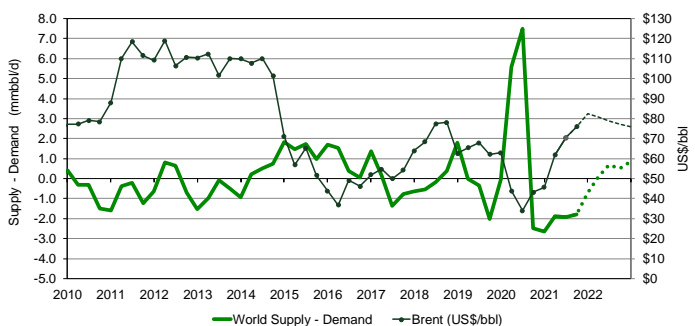
OPEC Excess Capacity



World Supply & Demand



World Supply & Demand vs. Brent Pricing



OPEC Production (Excluding Liquids)

Country (mmbbl/d)	Oct-19	Oct-20	Aug-21	Sep-21	Oct-21	Δ Y/Y	Δ M/M	Est. Capacity	Capacity Utilization
Algeria	1,020	870	920	930	940	8.0%	1.1%	1,060	89%
Angola	1,340	1,230	1,110	1,170	1,100	-10.6%	-6.0%	1,200	92%
Ecuador ⁽¹⁾	470	0	0	0	0	n/a	n/a	555	n/a
Equatorial Guinea ⁽¹⁾	120	110	100	110	110	0.0%	0.0%	110	100%
Gabon	200	200	180	200	180	-10.0%	-10.0%	220	82%
Iran	2,110	1,930	2,520	2,500	2,530	31.1%	1.2%	3,830	66%
Iraq	4,680	3,870	4,080	4,130	4,180	8.0%	1.2%	4,800	87%
Kuwait	2,670	2,300	2,450	2,480	2,500	8.7%	0.8%	2,715	92%
Libya	1,180	450	1,130	1,140	1,120	148.9%	-1.8%	1,200	93%
Nigeria	1,910	1,610	1,430	1,500	1,440	-10.6%	-4.0%	1,600	90%
Qatar ⁽¹⁾	0	0	0	0	0	n/a	n/a	640	n/a
Republic of The Congo ⁽¹⁾	330	260	270	250	290	11.5%	16.0%	290	100%
Saudi Arabia	10,020	8,990	9,630	9,690	9,810	9.1%	1.2%	11,500	85%
UAE	3,070	2,490	2,770	2,800	2,840	14.1%	1.4%	4,200	68%
Venezuela	690	340	540	540	540	58.8%	0.0%	600	90%
OPEC 13 ⁽¹⁾	29,340	24,650	27,130	27,440	27,580	11.9%	0.5%	33,325	83%

⁽¹⁾ Qatar and Ecuador left OPEC as of January 1, 2019 and January 1, 2020, respectively.

Equatorial Guinea and Republic of The Congo joined OPEC during 2017 and 2018.

Non-OPEC Production (Including Liquids)

Country/Region (mmbbl/d)	Oct-19	Oct-20	Aug-21	Sep-21	Oct-21	Δ Y/Y	Δ M/M
United States	20,060	17,890	19,020	18,450	19,420	8.6%	5.3%
Canada	5,470	5,400	5,420	5,530	5,780	7.0%	4.5%
Mexico	1,880	1,890	1,870	1,920	1,910	1.1%	-0.5%
Brazil	4,210	3,920	4,220	4,260	4,110	4.8%	-3.5%
Other S. America	1,980	2,370	2,440	2,430	2,440	3.0%	0.4%
Norway	1,790	1,890	2,100	2,040	2,180	15.3%	6.9%
United Kingdom	1,100	1,070	970	1,010	1,020	-4.7%	1.0%
Other Europe	1,180	1,160	1,220	1,210	1,220	5.2%	0.8%
Russia	11,480	10,210	10,700	11,000	11,130	9.0%	1.2%
Kazakhstan	1,980	1,770	1,620	1,690	1,850	4.5%	9.5%
Other Eurasia	1,100	1,070	1,060	1,050	1,050	-1.9%	0.0%
Middle East ⁽¹⁾	3,130	3,180	3,190	3,200	3,230	1.6%	0.9%
China	4,870	4,900	5,090	5,120	5,070	3.5%	-1.0%
Other Asia & Oceania	4,490	4,310	4,200	4,170	4,190	-2.8%	0.5%
Africa	1,550	1,440	1,310	1,340	1,350	-6.3%	0.7%
Non-OPEC	66,270	62,470	64,430	64,420	65,950	5.6%	2.4%

⁽¹⁾ Qatar is included in Middle East as of January 1, 2019.

Source: Bloomberg, EIA, TD Securities Inc.

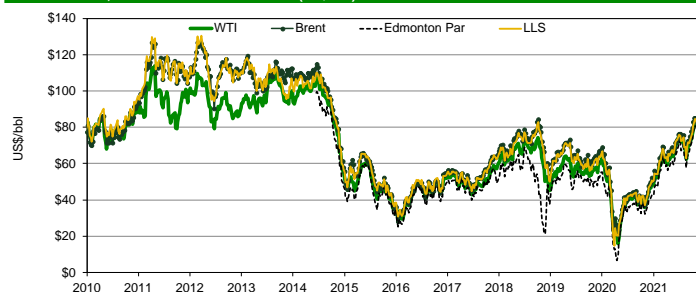
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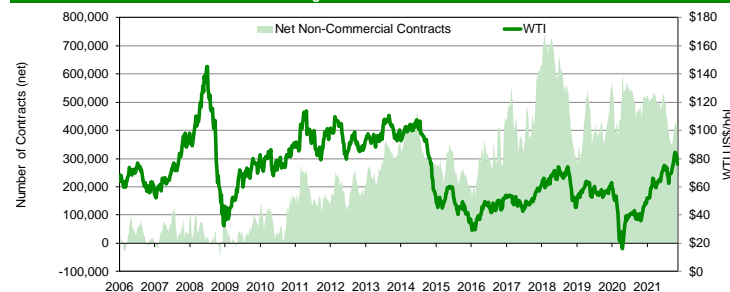
Exhibit 7. Pricing for Domestic and Global Benchmarks

LIGHT OIL - WTI, Brent & Edmonton Par Price (US\$/bbl)



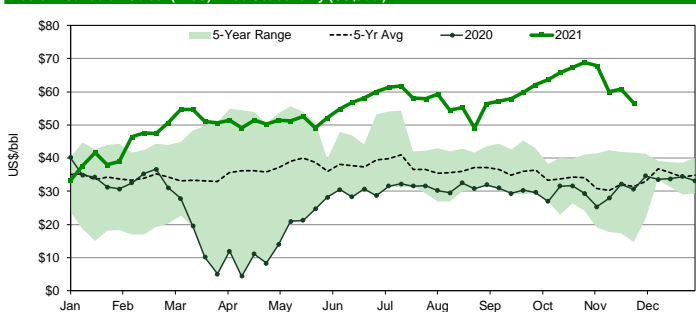
US\$/bbl	Last	Δ 1M	Δ 1Y
WTI	\$78.29	-5.3%	72.0%
Brent	\$81.70	-2.3%	69.7%
Edmonton Par	\$76.34	-3.5%	90.8%
LLS	\$78.69	-5.3%	67.4%

Net Non-Commercial WTI Contracts Outstanding



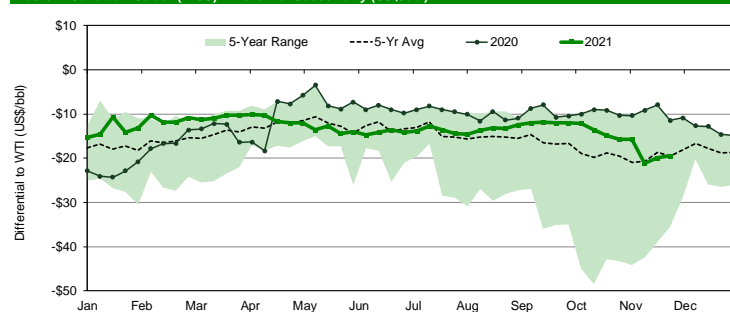
US\$/bbl	Last	Δ 1M	Δ 1Y
WTI	\$78.29	-5.3%	72.0%
Net Non-Commercial	415,785	-3.2%	-13.5%

Western Canadian Select (WCS) Price Seasonality (US\$/bbl)



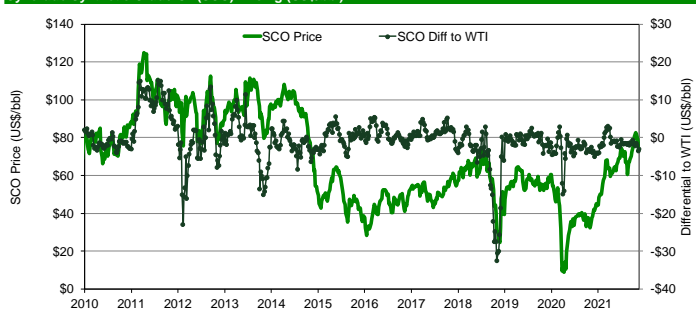
US\$/bbl	Last	Δ 1Y	Δ 5 Yr Avg
WCS Price	\$58.59	69.2%	80.3%

Western Canadian Select (WCS) Differential Seasonality (US\$/bbl)



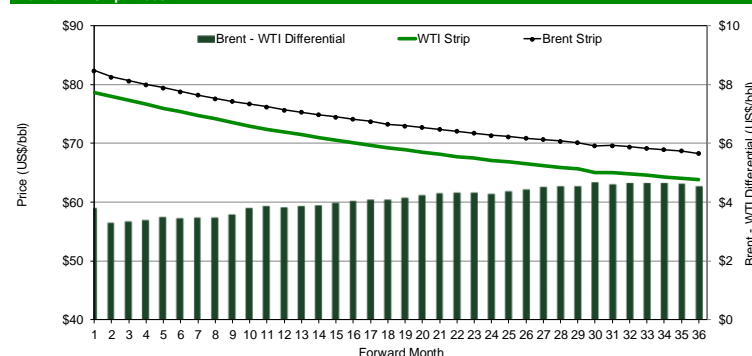
Diff. to WTI (US\$/bbl)	Last	Δ 1Y	Δ 5 Yr Avg
WCS Price Differential	-\$19.70	-80.9%	0.3%

Syn crude Synthetic Crude Oil (SCO) Pricing (US\$/bbl)

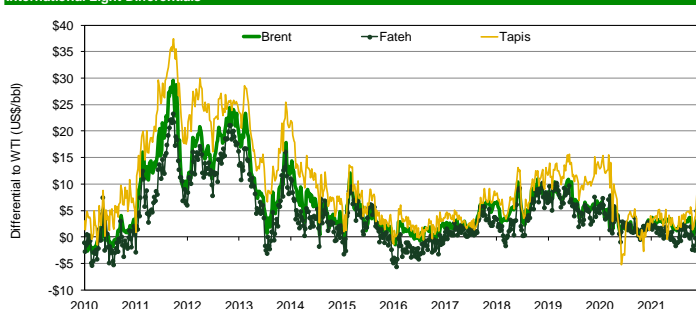


US\$/bbl	Last	Δ 1M	Δ 1Y
Synthetic	\$75.34	-6.8%	79.1%

Brent & WTI Strip Prices

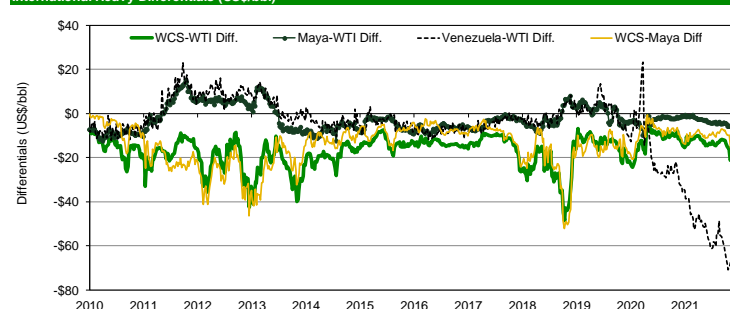


International Light Differentials



Diff. to WTI (US\$/bbl)	Last	Δ 1M	Δ 1Y
Brent	\$3.41	262.8%	30.2%
Fateh (Dubai)	\$2.65	nml	89.3%
Tapis (Malaysia)	\$6.11	66.5%	294.2%

International Heavy Differentials (US\$/bbl)



Differentials (US\$/bbl)	Last	Δ 1M	Δ 1Y
WCS-WTI	-\$19.70	-18.1%	-80.9%
Maya-WTI	-\$4.25	24.1%	-142.9%
Venezuela-WTI	-\$64.55	6.3%	-103.2%
WCS-Maya	-\$15.45	-39.4%	-69.0%

Source: Bloomberg, TD Securities Inc.

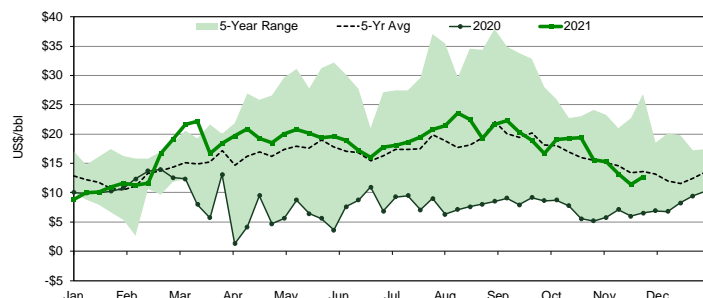
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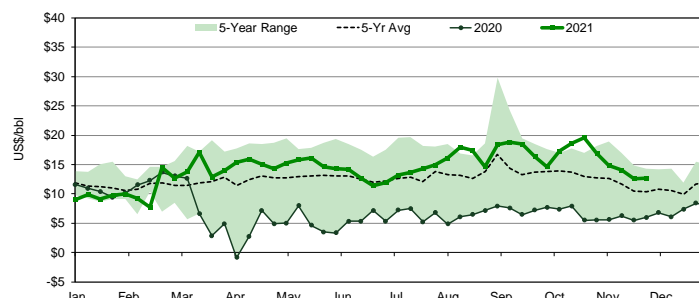
Exhibit 8. Refinery Profitability and Utilization

US Mid-continent 3-2-1 Crack Spread



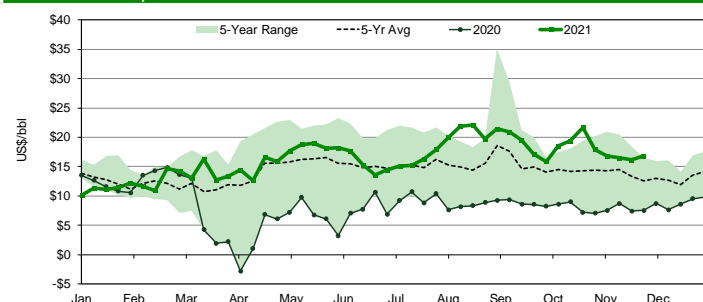
US\$/bbl	Last	Δ 1Y	Δ 5 Yr Avg
US Mid-continent	\$12.64	93.8%	-7.4%

US Gulf Coast 3-2-1 Crack Spread



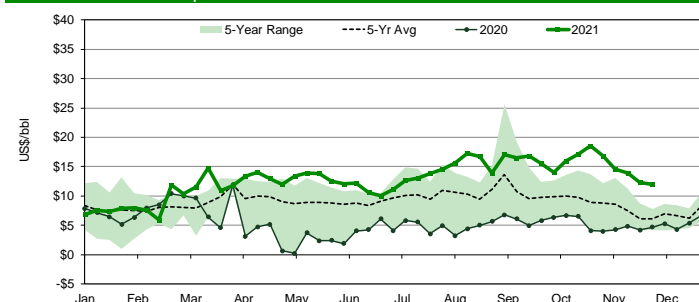
US\$/bbl	Last	Δ 1Y	Δ 5 Yr Avg
US Gulf Coast	\$12.69	112.8%	21.9%

US NYH 3-2-1 Crack Spread



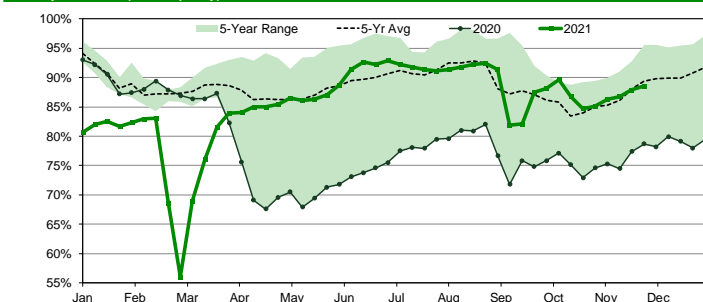
US\$/bbl	Last	Δ 1Y	Δ 5 Yr Avg
US New York Harbour	\$16.82	123.2%	33.8%

LLS Gulf Coast 3-2-1 Crack Spread



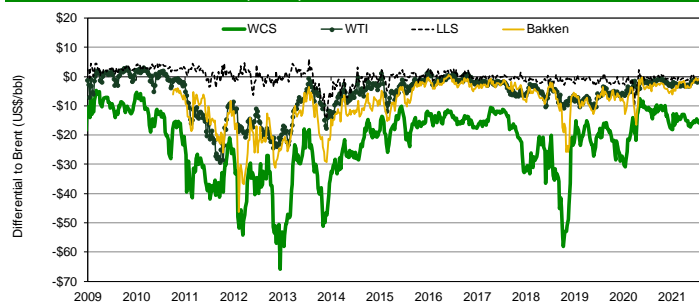
US\$/bbl	Last	Δ 1Y	Δ 5 Yr Avg
LLS Gulf Coast	\$12.01	n/m	95.7%

Refinery Utilization (% of Capacity)



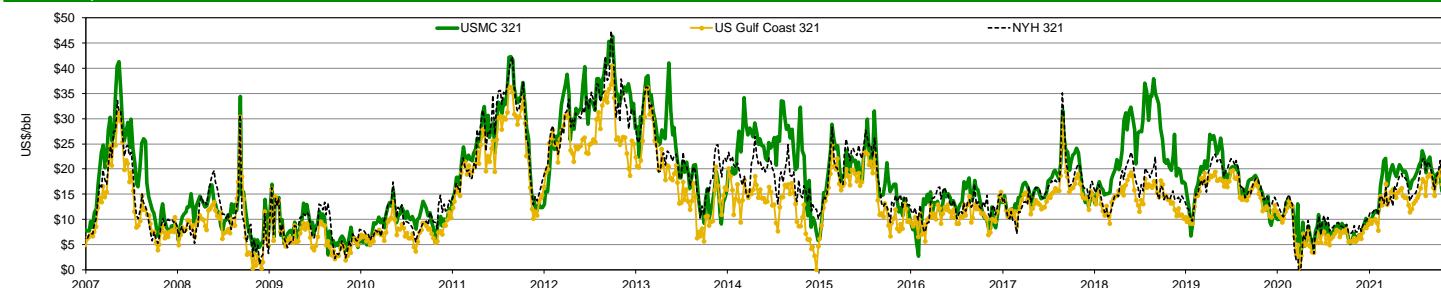
%	Last	Δ 1Y	Δ 5 Yr Avg
Refinery Utilization	89%	12.6%	-0.9%

North American Differentials to Brent (US\$/bbl)



Diff. to Brent (US\$/bbl)	Last	Δ 1M	Δ 1Y
LLS	-\$3.01	457.4%	168.7%
WTI	-\$3.41	262.8%	30.2%
Bakken	-\$2.91	-577.0%	-38.3%
WCS	-\$23.11	31.2%	71.1%

3-2-1 Crack Spreads



Source: Bloomberg, TD Securities Inc.

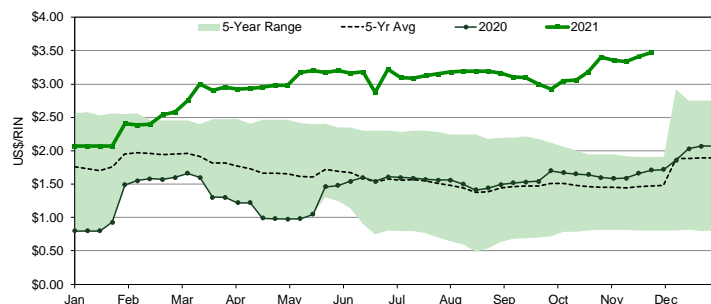
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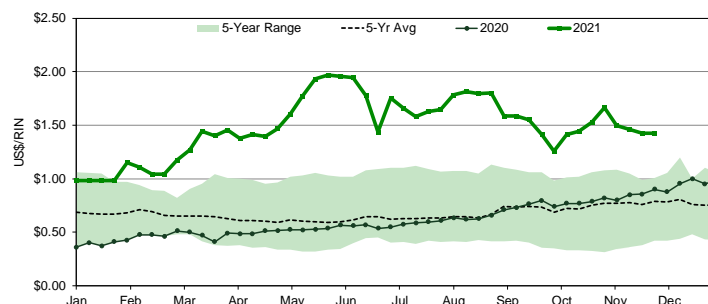
Exhibit 9. U.S. Renewable Identification Numbers (RINs) Trading Prices

D3 - Cellulosic Biofuel RIN



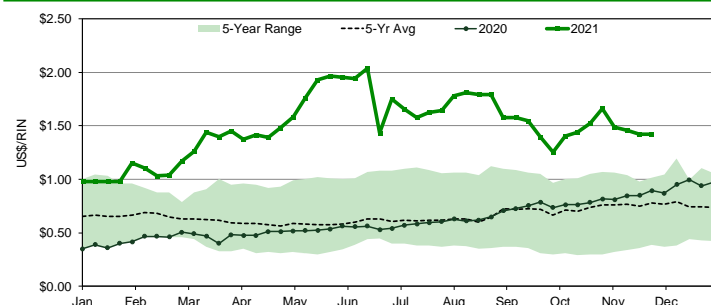
US\$/RIN	Last	Δ 1Y	Δ 5 Yr Avg
D3 - Cellulosic Biofuel RIN	\$3.47	102.9%	135.0%

D4 - Biomass Based Diesel RIN



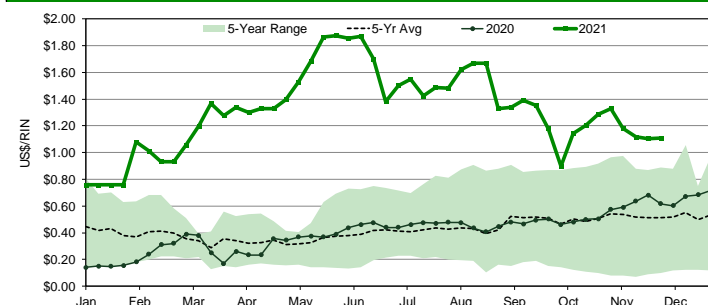
US\$/RIN	Last	Δ 1Y	Δ 5 Yr Avg
D4 - Biomass Based Diesel RIN	\$1.43	58.3%	81.1%

D5 - Advanced Biofuel RIN



US\$/RIN	Last	Δ 1Y	Δ 5 Yr Avg
D5 - Advanced Biofuel RIN	\$1.42	58.7%	82.1%

D6 - Renewable Fuel RIN



US\$/RIN	Last	Δ 1Y	Δ 5 Yr Avg
D6 - Renewable Fuel RIN	\$1.11	79.8%	116.0%

Source: Bloomberg, TD Securities Inc.

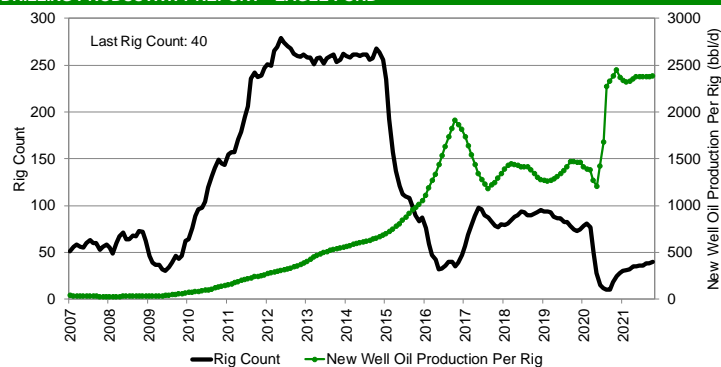
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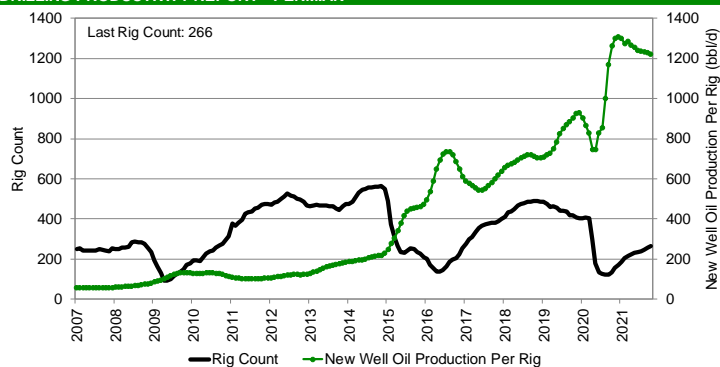
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Exhibit 10. U.S. and International Rig Counts & Rig Productivity for Select U.S. Oil Plays

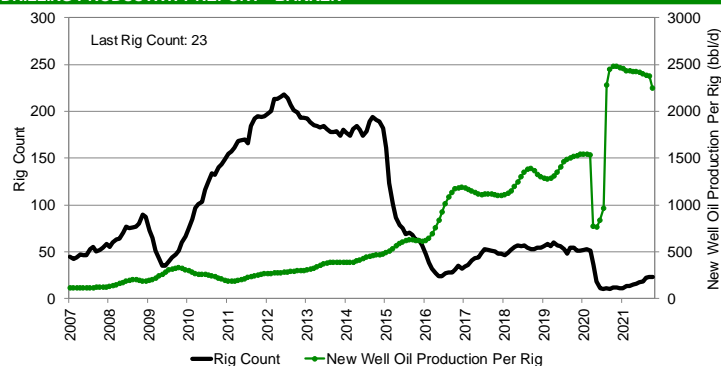
DRILLING PRODUCTIVITY REPORT - EAGLE FORD



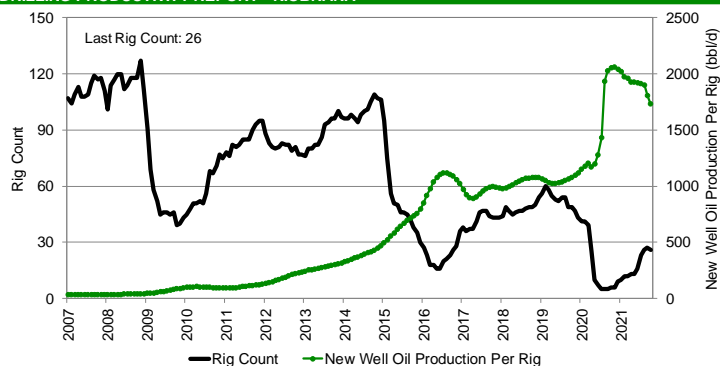
DRILLING PRODUCTIVITY REPORT - PERMIAN



DRILLING PRODUCTIVITY REPORT - BAKKEN



DRILLING PRODUCTIVITY REPORT - NIOBRARA



NORTH AMERICA ROTARY RIG COUNT

	11/20/2020	11/12/2021	11/19/2021	Δ W/W	Δ Y/Y
U.S.					
U.S. Land	296	539	546	1%	84%
U.S. Inland Waters	2	0	0	n/a	-100%
U.S. Offshore	12	15	15	0%	25%
Total U.S.	310	554	561	1%	81%
Canada					
Canada Oil	42	101	102	1%	143%
Canada Gas	59	67	65	-3%	10%
Total Canada	101	168	167	-1%	65%
Total North America	411	722	728	1%	77%

INTERNATIONAL ROTARY RIG COUNT

	10/31/2020	9/30/2021	10/31/2021	Δ M/M	Δ Y/Y
Latin America	86	140	152	9%	77%
Oil	81	125	136	9%	68%
Gas	5	14	15	7%	200%
Europe	101	106	104	-2%	3%
Oil	45	53	50	-6%	11%
Gas	40	45	44	-2%	10%
Africa	54	78	79	1%	46%
Oil	43	67	67	0%	56%
Gas	5	4	6	50%	20%
Middle East	245	269	275	2%	12%
Oil	191	208	212	2%	11%
Gas	54	61	63	3%	17%
Asia	170	194	190	-2%	12%
Oil	132	146	142	-3%	8%
Gas	25	30	32	7%	28%
Total International	656	787	800	2%	22%

* Regional totals include miscellaneous rigs not classified as an oil rig or a gas rig.

Source: Bloomberg, TD Securities Inc.

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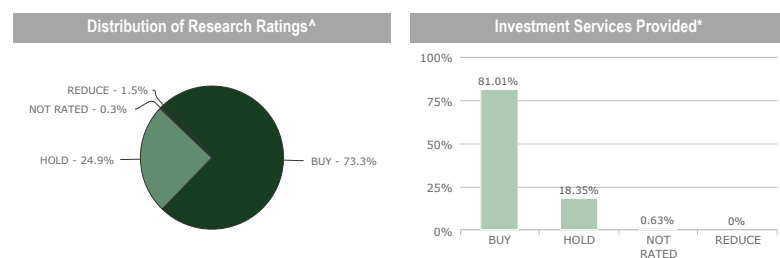
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