RBC Capital Markets

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Oil Strategy: Venezuela - The Fundamental Manual

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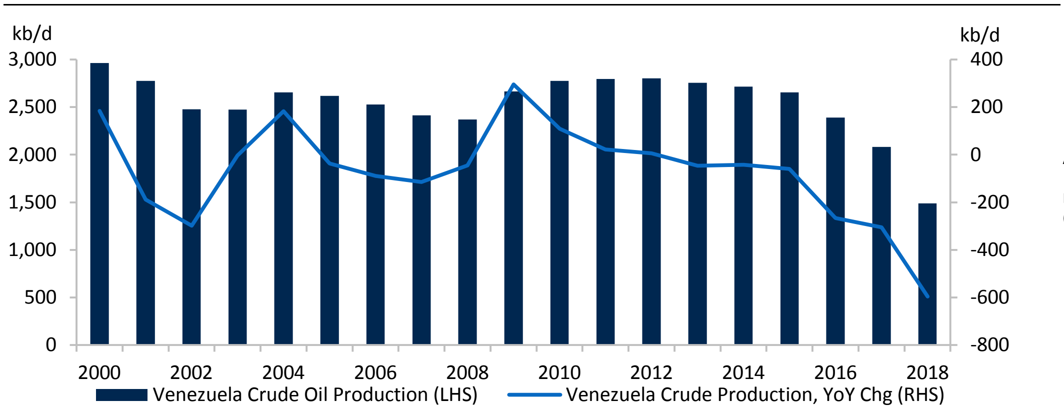
- **In light of sanctions on PDVSA, we highlight the market impact of an oil industry in shambles where production and exports have been sliding for years and domestic refiners are operating at abysmal utilizations. Any meaningful interruption in trade could trigger a test of domestic storage capacity and lead to production faltering farther.**
- **Re-arranging oil trade flow by diverting barrels from the US can have wide-ranging implications for global trade. Asia is the natural fit, but China has been tapering purchases from Caracas of late. Also, crude quality matters! Heavy, sour Venezuelan barrels are becoming increasingly difficult to replace given the challenges facing other similar spec producers like Canada, Mexico or Iran. Cue the bid for domestic sour crudes.**
- **The loss of Venezuelan heavies in the US leaves market share up for grabs. Common thought is that WCS should fare well, but our barrel tracker indicates that Canada has a limited footprint at US refiners of Venezuelan crudes. Mexico and Iraq are beneficiaries.**

Closer to the Brink

Amid the deteriorating political, humanitarian and economic situation unfolding in Venezuela, oil production has been drifting lower in recent years and output issues will likely accelerate. With yesterday's news of the US Treasury's Office of Foreign Assets Control (OFAC) placing sanctions on Venezuela's state-owned oil company, PDVSA, we are focused in this report on the direct barrel-impact of such a move. Under the sanctions, US refiners will still be able to buy oil from PDVSA, but the proceeds from the transactions will be restricted to a "blocked account" that will be set aside for the use of a new government in Venezuela. The same restriction will apply for PDVSA-owned CITGO, which will be able to operate but send no money to Maduro's regime. However, the US noted that the consideration to lift sanctions will be made for those that take "verifiable actions to support democratic order and combat corruption in Venezuela, including PDVSA." As we mentioned in Venezuela: Days of Rage…, around 90% of government revenue comes from Venezuela's oil exports, making energy sanctions particularly poignant given the already afflicted economy. The fluid nature of the situation suggests that the outlook for Caracas will likely get worse given that there is no silver bullet to right the ship over the near term. The potential path to recovery for Venezuela is likely to be a long and strenuous one. Oil production has plummeted by over 45% since the 2014 price collapse and we anticipate another 300-500 kb/d or more, this year. While the bleed in Venezuelan production is likely to continue, an acute acceleration of the downward tailspin is extremely meaningful for how we think about regional balances and competing crudes.

Figure 1: Venezuelan Crude Oil Production, Annual Average*



Source: RBC Capital Markets, Petro-Logistics, SA *includes non-conventional crudes

All values in USD unless otherwise noted.

Priced as of prior trading day's market close, ET (unless otherwise stated).

For Required Conflicts Disclosures, please see page 7.

Figure 2: Venezuelan Crude Production vs Exports

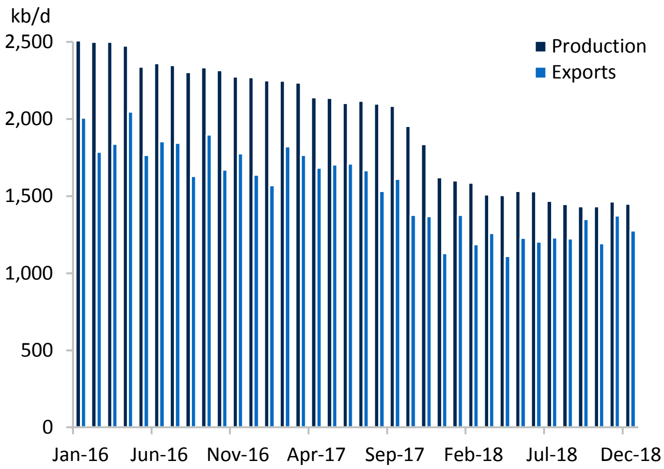
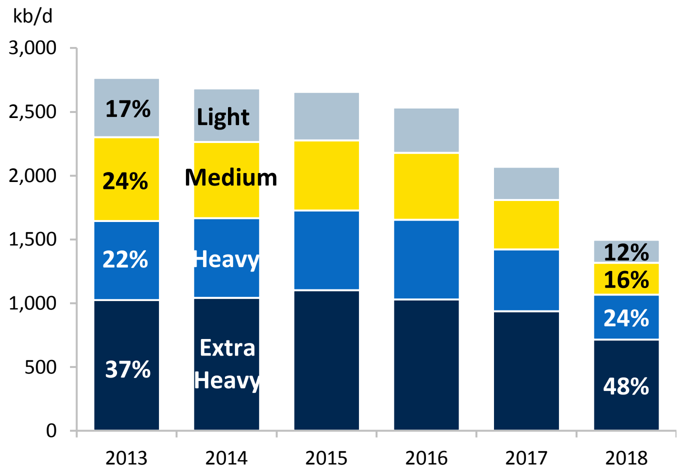


Figure 3: Venezuela Crude Oil Production by Quality



Source: RBC Capital Markets, EIA, IEA, Petro-Logistics SA, Country & Government Reports

The type of barrel produced in Venezuela has been getting heavier over time…

Venezuelan crude oil production has been on a downtrend for years. This is true across all crude grades, but from a composition standpoint, the heavies and extra heavies now make up over 71% of total Venezuelan crudes compared to sub 60% in 2013. In other words, the type of barrel produced is heavier than in the past. The evolving production slate is not a function of growth from heavier crude streams, but simply due to a disproportionate decline in light and medium production. This spells trouble given that several of the domestic refiners are configured to run a medium to lighter slate. As such, Venezuelan refinery activity is operating at abysmal utilizations with volumes last year averaging some 640 kb/d, which compares to 1.1 mb/d back in 2016 and total nameplate capacity of 1.3 mb/d. Energy sector sanctions will likely accelerate what has been a years long slide in Venezuelan production.

Disrupting sales could send Venezuelan production meaningfully lower

Curbs to output or re-arranging oil trade flow from Caracas could have a wide-ranging impact on several different regional oil balances. Venezuelan crude output has fallen precipitously over recent years, and at a notably faster pace than exports. Domestic use has contracted meaningfully, but nearly every barrel produced is now being earmarked for export, no surprise for a besieged government that derives 90% of its revenue from oil exports. Any meaningful interruption in sales could trigger a quick test of domestic storage capacity and in turn, lead to production faltering further.

Figure 4: Venezuelan Crude Exports by Key Region

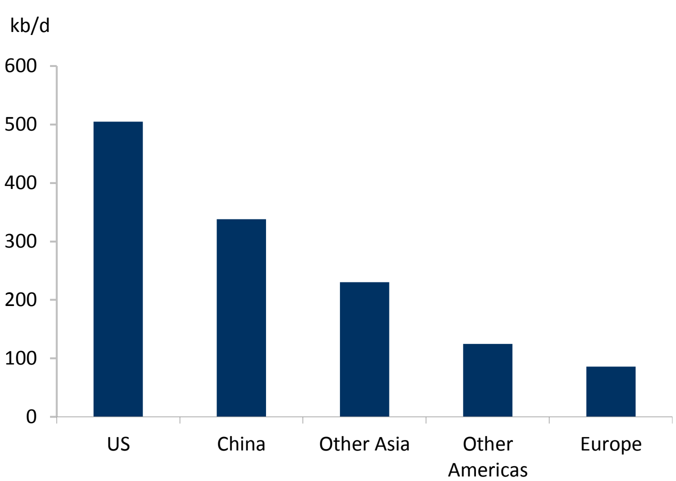
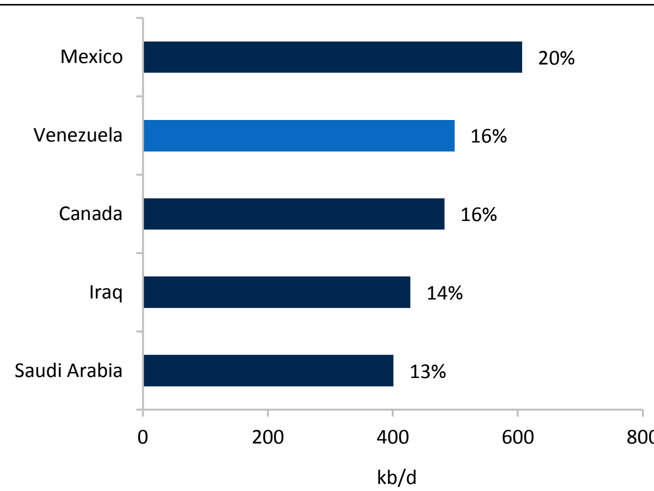


Figure 5: US Gulf Crude Imports by Source Country



Source: RBC Capital Markets, EIA, IEA, Petro-Logistics SA, Country & Government Reports

Regional and Quality Differentials in Focus

It is not just the number of barrels offline, but the type of barrel sidelined also matters

Even without new sanctions on energy, we anticipated that Venezuela would likely see its production decline by an additional 300 kb/d to 500 kb/d this year, sanctions announced yesterday could send that number higher yet. However, it is not just the number of barrels offline, but the type of barrel sidelined that is also meaningful for the market. Crude quality matters and heavy, sour Venezuelan crudes are becoming increasingly difficult to replace. One could typically turn to Canada or Mexico for similar spec replacement crudes, but Canada is plagued by egress and policy challenges while Mexican production remains in a precarious state of decline. Current sanctions on Iranian crude also mean that a host of medium and heavy, sour barrels are unable to make their way to market. Simply put, not all barrels are created equal and heavy, sour crudes are becoming increasingly difficult to come by, hence the recent spike in Mars and West Texas Sour crudes and global heavies like Angolan Dalia should likely perform over the near term. While Treasury Secretary Mnuchin stressed that sanctions will have a limited impact on oil markets due to adequate stockpiles, disruption risk is unequivocally constructive for oil prices, and a rising tide lifts all boats, but the level of relative bullishness is not uniform across the oil market. While the nature of barrels at risk is difficult to handicap, we track the flow of exports to highlight the relative winners and losers in the event of further Venezuelan outages of any size.

Heavy, sour crudes are becoming increasingly difficult to replace

Searching for a Home

Current Venezuelan crude exports tally some 1.3 mb/d, with nearly 40% headed to the US and 25% earmarked for China. The remaining third is distributed between OECD Asia and Europe (see Figure 4). Venezuelan crude exports to the US have halved over recent years, with exports averaging 505 kb/d in 2018, down from levels over 900 kb/d earlier this decade. Further reduction of exports to the US means that the barrels will have to find alternate homes. Market share growth in emerging Asia is undoubtedly the focus of any major oil exporting country given the demand growth profiles of China and India. Venezuela can prioritize exports to the region, particularly given the existing oil for loan obligations with China, but the region is the most competitive battleground on the planet. And while they remain the second largest market for Venezuelan crudes, the Chinese have tapered buying from Caracas over the past two years. The region with the biggest shortfall of Venezuelan crudes, either through sanctions or inadvertently through further production declines is the US.

The US will be most impacted by a shortfall in Venezuelan barrels

Figure 6: Venezuelan Crude Exports to US Refiner

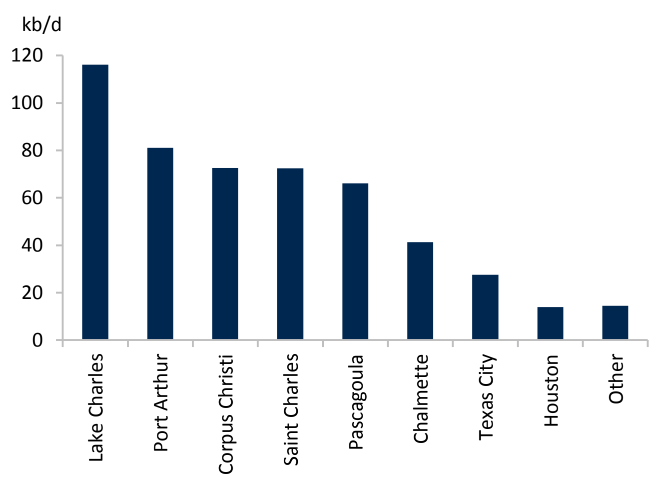


Figure 7: US Refiners of Venezuelan Crude by Quality

Refiner	API	Sulpher
Lake Charles	23.62	2.11
Port Arthur	22.17	2.90
Corpus Christi	23.65	2.63
Saint Charles	18.06	3.37
Pascagoula	20.69	2.67
Chalmette	18.10	2.88
Texas City	25.68	2.68
Houston	20.84	3.06
Wilmington	26.94	2.29
Garyville	25.32	2.49

Source: RBC Capital Markets, EIA, IEA, Country & Government Reports

Figure 8: Market Share of Imports by Country to US Gulf Refiner of Venezuelan Crudes

Refinery	Venezuela	Canada	Saudi Arabia	Mexico	Iraq	Other
Lake Charles (Citgo)	43.3%	7.6%	19.8%	12.9%	5.3%	11.1%
Port Arthur	14.2%	10.4%	42.8%	22.0%	3.8%	6.7%
Corpus Christi (Citgo)	37.7%	0.6%	0.0%	15.0%	24.0%	22.7%
Saint Charles	93.4%	0.0%	0.0%	0.0%	5.6%	1.0%
Pascagoula	32.2%	0.0%	0.0%	33.8%	16.5%	17.5%
Chalmette	59.7%	0.0%	0.0%	19.5%	2.4%	18.4%
Texas City	67.0%	0.0%	0.0%	0.0%	31.8%	1.2%
Houston	6.5%	15.6%	0.0%	37.9%	3.1%	36.9%

Legend: > 50% | 50% > 20% | 20% > 10%

Source: RBC Capital Markets, EIA, Country & Gov't Sources

Market Share Up For Grabs

A shortage of Venezuelan crudes in the US Gulf Coast will trigger a regional scramble for heavy, sour barrels

Venezuelan exports to the US have tapered considerably over recent years. Last year, Venezuela sold crude to 13 US refiners, down from 22 counterparties in 2012. Of those exports, there is also increasing concentration within a small handful of refiners. The top six refiners of Venezuelan crude comprise nearly 90% of total imports. Simply put, not only are there fewer counterparties taking Venezuelan barrels, but the refiners that continue to take barrels are typically buying at a smaller clip. The Venezuelans own CITGO Refining, which operates the Lake Charles and Corpus Christi refiners in the US Gulf and the Lemont refinery in the Midwest. Other refiners such as Chalmette, Saint Charles, and Texas City are highly dependent on Venezuela for more than 60% of their total imports. The average crude quality imported by the refiners running Venezuelan crudes involves a 21.8 degree API and 2.7% sulphur spec crude. Replacing such barrels will be a tall task.

Figure 9: US Sour Crudes Relative to WTI

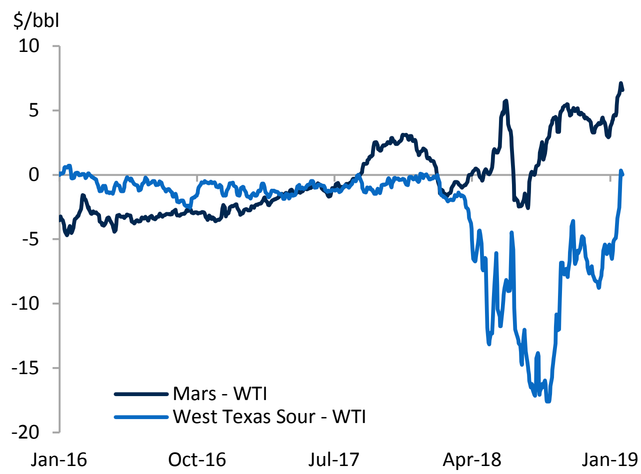
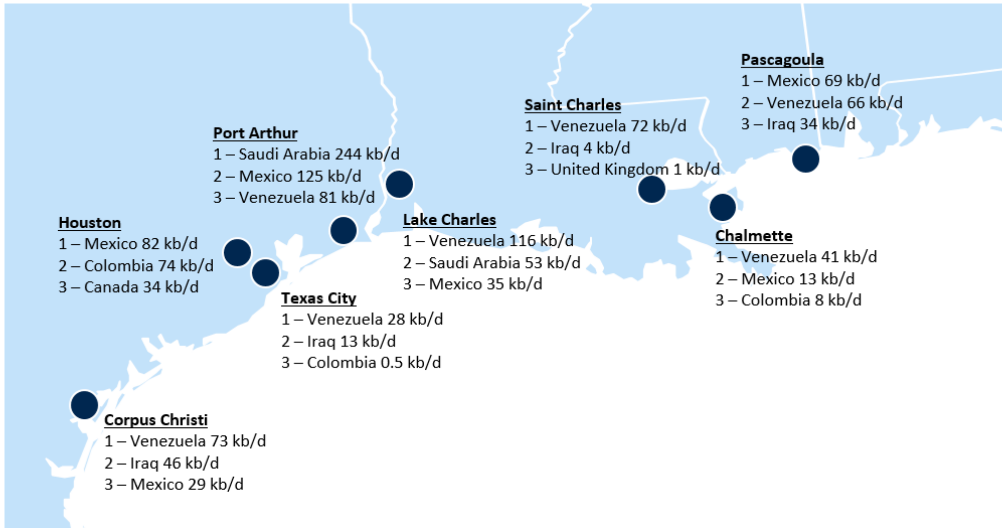


Figure 10: Venezuela Floating Roof Tank Oil Storage*

Source: RBC Capital Markets, Bloomberg, Orbital Insight *7 Day Moving Average

Figure 11: Top Three Competitors at Main US Refiners of Venezuelan Crude*



Source: RBC Capital Markets, EIA *Volumetric imports by top three sources

Canada has a small footprint at key refiners of Venezuelan crude, bringing into question its ability to scoop up market share

Mexico and Iraq stand out as the countries with the most market share to gain in the US Gulf at the expense of Venezuela

As suggested, a shortage of Venezuelan barrels in the US Gulf Coast will trigger a regional scramble for heavy, sour crudes and place a bid into those barrels. The top five shippers to the US Gulf include: Mexico, Venezuela, Canada, Iraq and Saudi Arabia, in that order (see Figure 5). Those five countries make up nearly 80% of total US Gulf imports. If Venezuela squanders its market share, who stands to scoop up the most market share? Similar spec, heavy oil producers such as Mexico and Iraq stand out as the countries with the most share to gain in a Venezuelan barrel-loss scenario given that they have the most meaningful customer network in the region and those crudes currently compete head to head with Venezuelan heavies at the greatest number of US refineries (see Figure 11).

While the general belief is that Canadian heavy barrels should benefit with the demise of Venezuela, the notional degree of market share up for grabs for Canada is not as large as for competing countries. Until the ongoing pipeline issues are addressed, crude by rail is simply not as scalable as increased shipments from Mexico or Iraq. More importantly, Canada does not have much of a footprint at key refiners of Venezuelan crudes, sending only an aggregate 113 kb/d to Lake Charles, Port Arthur and Houston, three wildly competitive battlegrounds while having next to no imprint at the other refiners

Canadian barrels will be able to further penetrate refiners close to the terminus of the Seaway and Marketlink pipelines in the Houston area while Mexico will have the advantage with other coastal refiners, or further eastbound near Louisiana where Canadian barrels have difficulty moving laterally across the Gulf. Mexico holds significant market share at many of the refiners that currently take Venezuelan crudes, and should be the biggest benefactor. The marketing relationship and the familiarity between the crude slate and corresponding yields also helps to make sourcing barrels from existing trade partners less burdensome than seeking new trading partners. In other words, further deterioration of Venezuelan production is undoubtedly bullish for all crudes, but incrementally more constructive for North American balances, and unquestionably most bullish for Mexican crudes, particularly its Maya heavy, sour stream.

Appendix: Select Global Crude Oil Benchmarks by Quality

Crude Benchmark	API	% Sulphur Content	Country
BCF-17	16.5	2.53%	Venezuela
Western Canadian Select	20.3	3.43%	Canada
Maya	22.0	3.40%	Mexico
Dalia	23.1	0.52%	Angola
Basra Heavy	23.7	4.12%	Iraq
Oriente	24.1	1.51%	Ecuador
Mars	28.8	1.80%	USA
Kuwait	30.0	2.50%	Kuwait
Dubai	30.0	2.10%	UAE
Iran Heavy	30.2	1.77%	Iran
Urals	31.0	1.40%	Russia
Daqing	32.2	0.11%	China
Oman	33.0	1.10%	Oman
Arab Light	33.0	1.70%	Saudi Arabia
Bonny Light	35.0	0.20%	Nigeria
Es Sider	36.0	0.50%	Libya
Azeri (BTC)	36.8	0.15%	Azerbaijan
Brent	37.5	0.40%	North Sea
WTI	39.0	0.50%	USA
Kashagan	42.0	0.80%	Kazakhstan
Sahara	46.0	0.10%	Algeria

Source: RBC Capital Markets, EIA, Bloomberg, BP, Government Reports

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