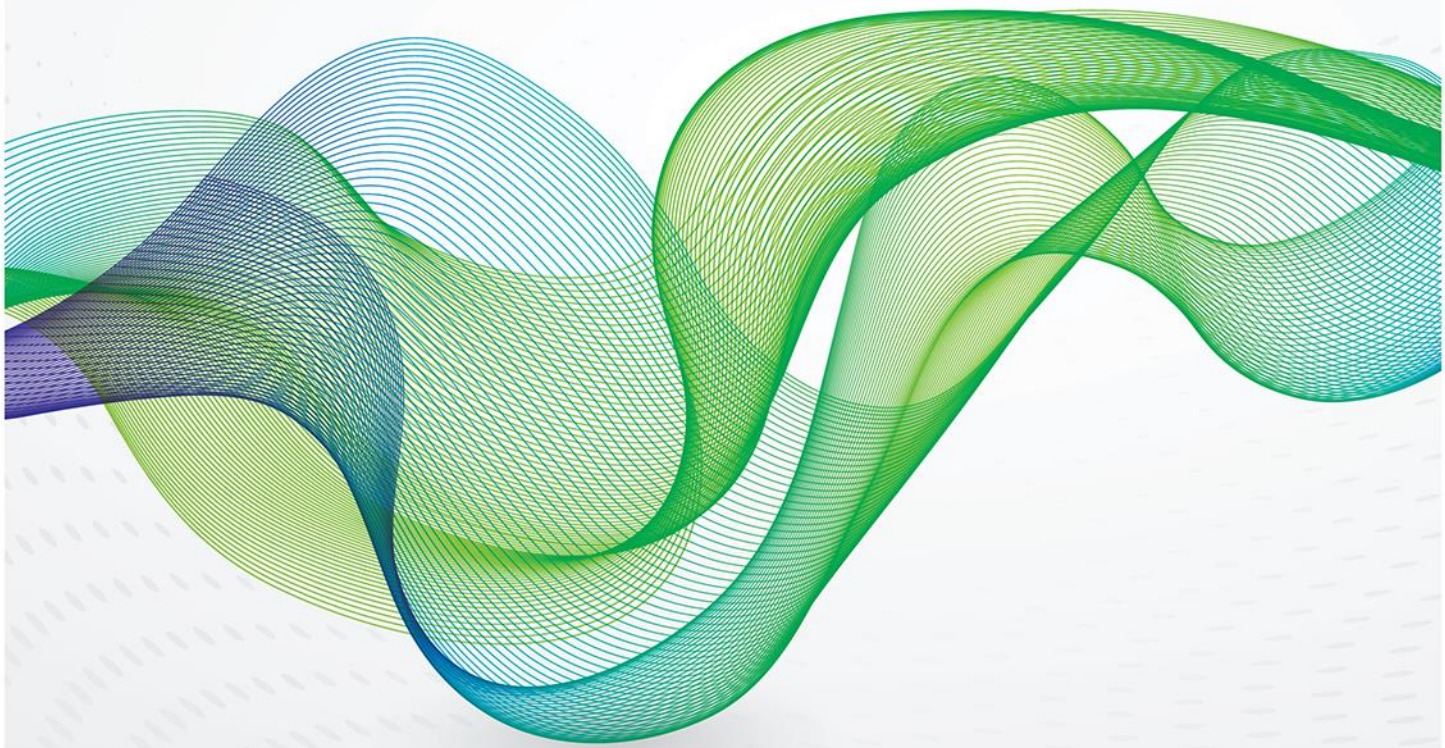
THE OXFORD INSTITUTE FOR ENERGY STUDIES

November 2017

US Crude Exports – Gaining Ground



OXFORD ENERGY COMMENT

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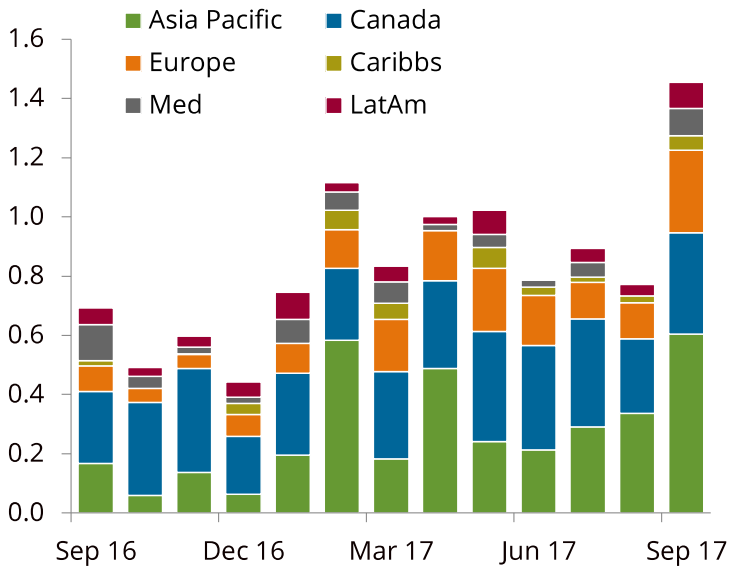
1. Introduction

US crude oil exports surged to a record high of 1.8 mb/d in October 2017, 1.2 mb/d higher y/y (see Figure 1). A few months earlier, the market had fervently questioned the ability of the US to export more than 1.2 mb/d, suggesting capacity constraints would cap departures at this level and result in large inventory builds on the US Gulf Coast. The viability of export arbitrage given the prevailing economics at the time and the international market's appetite for 'low quality' US oil also came under scrutiny. But the reality on the ground was different, as physical players re-affirmed their belief in the adequacy of US dock capacity and the combination of wide WTI-Brent spreads and strong cash differentials in Asia and the North Sea lubricated the gears of arbitrage. Indeed, at the end of October, US exports topped 2 mb/d, exceeding even the most bullish of expectations, as the combination of high export demand and backed-up cargoes following Hurricane Harvey buoyed departures. Despite the October furore, the US is unlikely to export 2 mb/d of crude oil on a sustained basis in the near term. It is expected that exports will average 1.7 mb/d in 2018, with much of the y/y export growth occurring in the first half of 2018 – primarily due to a low base. But in the second half of 2018 export volumes should also remain robust, in line with a weak forward WTI-Brent strip that currently averages -$5.85 per barrel for 2018, which is enough to open the export arbitrage window from the Gulf Coast.

Figure 1: US crude exports by destination, y/y change, mb/d



Source: EIA, Energy Aspects

2. Factors affecting US crude exports

However, achieving these volumes is dependent on several factors. First, **US production growth** must be sufficient to allow for both an increase in refinery demand in 2018 and incremental export demand. If US production growth falters on either lower crude oil prices or on a shift towards disciplined growth from shale producers, then export volumes will be constricted. Second, there will need to be a sufficient supply deficit in **global balances** for shale production growth to fill. If global demand falters in 2018 or supplies surprise to the upside (either through higher availability of OPEC crude or a recovery in non-OPEC production), then shale exporters will find themselves in a difficult predicament. Third, **sufficient infrastructure** must exist to allow shale production growth to move from the wellhead to domestic trading hubs and then from these trading hubs to export terminals. Finally, international markets need to become comfortable with the **quality of US crude** oil. Well-known grades such as Mars and WTI-Midland are known entities, but tank blends like Domestic

Sweet (DSW) are still largely internationally untested and have so far received a poor reception in international markets. When combined, the above factors should manifest themselves in the spreads between WTI and US cash differentials and between US crude prices and international ones.

US production growth

Forecasting US crude oil production has been a rollercoaster ride over the past 18 months. The market has moved from calling time on shale production in mid-2016 to calling for astronomical growth rates in 2017. Consensus estimates for US crude production growth today are between 0.7 and 1 mb/d y/y for 2018. Assuming production growth of 0.7 mb/d and 0.21 mb/d of refinery runs growth next year and 0.1 mb/d of synthetic crude exports from Canada, the US will have at least 0.59 mb/d of incremental crude oil length to dispose of. In a backwardated market, there will be little incentive for traders to store this material. This means exports are likely to be the only option to dispose of this length. It also means the volume of oil exported is directly linked to the volume of oil supplied to US refiners, minus the volume that they run.

US Crude Exports: Where to?

Recent volatility in ICE Brent spreads has offered an early insight into the possible clearing mechanism for Atlantic basin markets in the face of high US crude exports. These spreads moved from a strong backwardation of some 45 cents per barrel down to 15 cents per barrel as US cargoes began to arrive in Europe and as they pushed out North Sea crudes from Asia (see Figure 2). Similarly, WAF crudes have struggled to clear and these differentials have moved lower on a sustained basis as they attempt to price at competitive levels relative to US crudes (see Figure 3). Short-term fluctuations aside, and assuming that global liquids balances will draw by 0.2 mb/d, US exporters will continue to find steady demand for their products over the course of 2018. However, what is more difficult to predict at this stage is where exactly the new customers for US oil will be. So far this year, US crude exports have been largely split between Asia Pacific (36% or 0.34 mb/d), Canada (32% or 0.31 mb/d) and Europe (17% or 0.17 mb/d). However, Canada is likely already nearing saturation as it has already backed-out large volumes of US crude this year. Europe may be able to accommodate further US barrels by sending more North Sea oil towards the East, but given the fragile pricing in the region today, it is unclear how well North Sea markets will hold up under the relentless onslaught of US exports expected in 2018. This leaves Asia Pacific as a key destination market for US crude, particularly as promising demand has already emerged from the region.

Figure 2: Brent time structure 1-2 month $/barrel

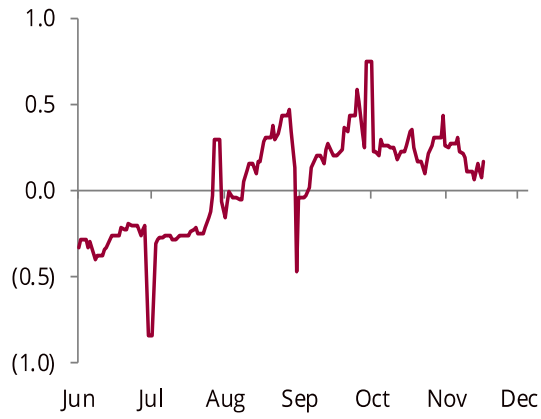
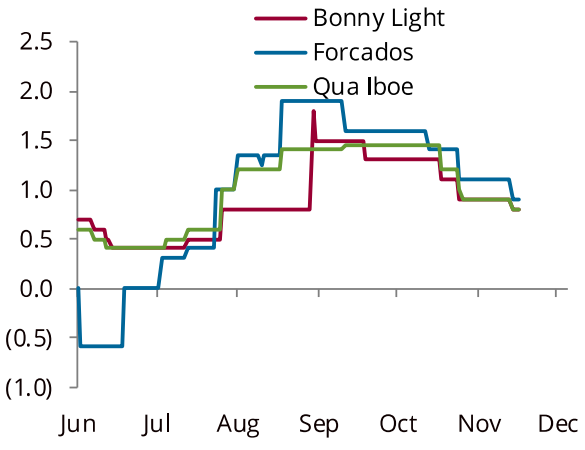
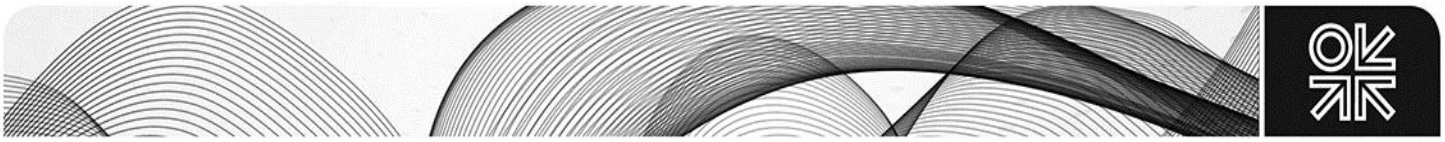


Figure 3: Nigerian diffs to Dated Brent, $/barrel



Source: Argus Media

Importantly, this Asian demand for US crude is not limited to spot purchases dictated by arbitrage economics. There are already pseudo term arrangements with Asian parties holding equity in US upstream projects, politically motivated purchases made on governmental mandates, and deliberate diversification by Asian buyers keen to move away from reliance on OPEC and Middle East crudes.



These flows will likely develop over time and ensure a baseload of demand for US crude in the East. But, new markets will also need to emerge to absorb the export growth that is expected to materialise. A key market here may be Latin America, where dwindling domestic production is leaving refineries short of crude. The proximity of these plants to US production and their less complex refineries means the region could be a willing buyer of more US oil over the next 12 months. Similarly, there is scope to develop US markets more. The US East Coast (USEC) still relies on almost 1 mb/d of crude oil imported from the Atlantic basin; if Jones Act rates fall to make the arbitrage viable then there is certainly potential for more Permian oil to supply these refineries.

Infrastructure

A popular angle of analysis around US export infrastructure focuses on dock capacity. While this is an important consideration, it is certainly not the most important potential infrastructure constraint when it comes to US export capacity. Summing the record daily loads for all ports in the US on any given day show that more than 3.2 mb/d of export capacity could exist under perfect operating conditions. Clearly this is a theoretical maximum and in practice, constraints would likely exist at a lower level of around 2.5 mb/d based on current infrastructure. But it is not the size of the docks that limits their ability to export. Instead, it is the tankage at the dock that must unload oil into a ship and the pipelines that feed those tanks that must refill them quickly to ensure a steady rate of loadings. Many of these tanks and pipelines are already used to supply domestic refineries, either by delivering domestic oil to them or by piping imported sour crude. Looking further ahead, the pipeline infrastructure from the wellhead to the export terminal must be sufficient to move production growth to the water.

In order to ensure that this process can occur, a wave of new midstream investments have been made over the last six months. Some 1.1 mb/d of new pipeline projects between mid-2017 and end-2019 have been tracked that aim to transport oil from the Permian basin to the Gulf Coast.

A final important infrastructure constraint is the competition that crude exporters face at the docks from product exporters. As the Gulf Coast refining fleet increasingly gears up to export more refined product overseas, demand for berthing and lightering will rise exponentially. This means crude export schedulers will be forced to jostle with refined products shippers to secure space on the dock for their exports.

US crude quality

In the early days of crude exports, US barrels got a bad rap overseas as foreign refiners complained about high metals content, variable refining yield and unstable quality. These are issues that US refiners have plenty of experience with as blenders increasingly saw attractive margins by combing heavy sour high TAN Canadian crude with Rockies condensates and Bakken light sweet to create a tank-blend known as Domestic Sweet (DSW). With DSW increasingly shunned by US refiners, some players attempted to export it into international markets as WTI. However, would-be importers of US crude have become wise to DSW and now specify the grades they are willing to accept in their tenders. Indeed, various Asian and Latin American refiners specifically tender for field-grades such as WTI-Midland, Bakken or Eagle Ford and these barrels have proved popular in overseas markets.

3. Variability is the name of the game

Importantly, there will be a high level of variability in both export volumes as well as destinations each month as arbitrage economics shift and the oil market gyrates within seasonal patterns. But, the corollary of US production growth is US exports: one cannot exist without the other. And, the signals are being sent to both US producers and US exporters that the world will need their oil. First, flat price has moved sharply higher over the last few months, in line with the global rebalancing post-OPEC cuts. Second, forward futures curves have moved into backwardation, signalling that the market will require oil from storage to meet demand. Third, foreign customers have proved impressively receptive to US shale crudes even despite the high light-ends content often associated with these barrels. Finally, shale producers are being given the green light to produce: their equity is rallying from the August lows, appetite for their debt is healthy, the market is backwardated and flat prices are higher.