MARKET INSIGHTS

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Changes in the Brent Market: Declining Production and Underinvestment

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Major changes are afoot in the North Sea Brent market. Interestingly, these changes have been going on for some time, yet largely unnoticed by much of the energy community and media. The critical issues are the exceptionally low levels of investment in the Brent oil-producing region and declining stocks. Underinvestment and falling production in the Brent region relative to expanding investment and production in the US and West Texas Intermediate (WTI) region is a key part of the story in how these oil price benchmarks relate to each other. Price discovery for Brent sets the tone for what European consumers pay for crude oil. There has been a dynamic and evolving price discovery relationship both for Brent and WTI regarding their linkages to oil produced in parts of Africa and the Middle East, in part due to transportation infrastructure and the locations of the end-users. The pivotal question is how, as production dwindles, the role of Brent as a regional benchmark might change relative to other benchmarks, such as WTI. In this report we go through the current conditions in production and investment, and address some of the peripheral issues affecting Brent at the moment.

Production and Investment or the Chicken and the Egg Problem

Looking at the dynamics of the North Sea Region, recoverable reserves are reasonably extensive, but the production profile needed to keep pace with extracting those reserves is just not high enough. To put some context around the production decline, note that production fell by 38% between 2010 and 2013 – this means a fall of 500 million barrels per day of oil production in that period.

North Sea Crude Production (in millions of barrels)

Source: Bloomberg Professional (LOSDNSET)

An energy research firm, Consilience Energy Advisor Group, notes that as of February 2014, the combined production of Brent, Forties, Ekofisk and Oseberg or BFOE (the four grades that make up Brent) is just under one million barrels per day, which is less than two standard 600,000 barrel cargoes. It is expected that production would decline well below the standard 600,000 barrel cargo per day, assuming no additional investment by 2020 (see table 1).

The production costs are related to a plethora of factors including size and accessibility of the field, ease of extracting and proximity to the surface, and the potential to take advantage of economies of scale. According to the Reuters 2009 report, development costs for producing oil in Saudi Arabia are the cheapest in the world at $1-2 per barrel. The cost in the United Arab Emirates, more broadly, is $7 per barrel. While average cost in North America is $10- $12 per barrel and cost in the North Sea is a staggering $30-$40 per barrel. Oil in the sands of Alberta is even more expensive to develop and extract.

Table 1: BFOE Production Forecast

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<tbody>
<tr>
<td>Brent Blend</td>
<td>137,906</td>
<td>125,242</td>
<td>106,987</td>
<td>97,578</td>
<td>75,493</td>
<td>65,440</td>
<td>58,079</td>
</tr>
<tr>
<td>Forties Blend</td>
<td>381,545</td>
<td>327,884</td>
<td>289,141</td>
<td>269,221</td>
<td>228,752</td>
<td>195,322</td>
<td>159,287</td>
</tr>
<tr>
<td>Oseberg Blend</td>
<td>119,856</td>
<td>101,353</td>
<td>75,042</td>
<td>54,877</td>
<td>41,931</td>
<td>32,432</td>
<td>26,578</td>
</tr>
<tr>
<td>Ekofisk Blend</td>
<td>356,762</td>
<td>358,306</td>
<td>368,097</td>
<td>353,843</td>
<td>328,213</td>
<td>299,270</td>
<td>264,733</td>
</tr>
<tr>
<td>Total</td>
<td>996,069</td>
<td>912,785</td>
<td>839,267</td>
<td>775,519</td>
<td>674,389</td>
<td>592,464</td>
<td>508,677</td>
</tr>
</tbody>
</table>

Source: Consilience Energy Brent report March 2014

While accelerated development has the possibility to offset losses in production, significant investment would be required. The current scenario is such that no one player or company has their heart set on developing the region. For example, one only needs to look at the Clair field play, where while considerable oil reserves exist, there appears no promise of developing the region or ramping up production there. BP, acting as the lead operator, has said that if the appraisal goes well in the Clair field, it is willing to invest $500 million in the North Sea but an “if and a maybe” is very different from a definite yes.

The key issue is expected future profitability. The returns in the North Sea are certainly not as lucrative as in the past, which is one of the primary reasons why producers have moved production to other areas of the world.

To put some numbers around this concept, note that the oil production cost – that is the cost to pump a barrel of oil out of the ground, not including capital expenditure cost, has a wildly large range – between $1-$50/barrel.

2 Reuters Factbox – Oil Production cost estimates by country (published 2009)
reuters.com/article/2009/07/28/oil-cost-factbox-idUSLS12407420090728
North Sea Total Oil Production by Field

Source: Oil and Gas UK 2012 Economic Report, pg 18 (the UK’s Continental Shelf)

Beyond development costs, the distribution or transportation costs of getting the oil to the end-users also effects future profitability and how oil from one region connects and competes with oil produced in other regions. North Sea Crude oils are largely seaborne so the oil flows from the source of production at the wellhead to a terminal where the crude oil is loaded onto a ship or alternatively directly to a refinery (as is the case with some of the Forties crude oil stream). Crudes can easily be exported to refiners outside of the region which provides a valuable outlet for sellers that may be struggling to place the barrels with refiners in Europe. This compares with WTI which flows to refineries in the US mostly via pipelines, except for the important role of rail with the oil produced in the Bakkan field. And, then oil from Alberta, in another example, also flows largely by rail.

Political risk also plays a role in investment in oil fields. A major attraction of Brent oil was its abstraction from political risk and general market turmoil – which is a very different scenario than in certain significant oil-producing fields in the Middle East and Africa. We have to note at least the possibility that the upcoming Scottish independence referendum, set to be held in September of this year, could lead to significant political disruption, at least in the financial sense. An independent Scotland would have profound implications for the region, with some in the Scottish Independence party claiming North Sea Brent resources as Scotland’s already. In regards to Brent production in the North Sea, it is notable that the head of BP, Bob Dudley, has been especially vocal in his support for a unified Great Britain – citing uncertainty with the currency and relationships with Europe if Scotland was to secede from the union.

Setting the Scottish issue aside, the effects of a lack of investment are being felt now, and will continue to be magnified moving forward. Aging assets and infrastructure challenges suggest significant further declines in production with little likelihood that the investments needed to change this picture will be forthcoming.

WTI and Brent: A Tale of Two Production Stories

Contrastingly, while production is down in the North Sea, production in the US is significantly up - increasing by 50% since 2008 to 8 million barrels per day. In 2013 alone, US production grew by more than 10% - the largest growth in the last 60 years. While, more specifically, total WTI supplies have doubled since 2009.

US Crude Production (in millions of barrels)

![Graph showing US Crude Production (in millions of barrels)](image)

Source: Energy Information Administration, total US production data.

All this adds to the complexities of how Brent is priced relative to other benchmarks in the global market for crude oil. While price discovery for WTI provides a base reference for US consumers, WTI’s status and increasing importance on global oil prices could further be solidified as US refined product exports increase, which they did by 2.5 times in the period of 2005-2012, as well as if regulation permitting unrestricted exports of crude oil is introduced. Meanwhile, adamant supporters of Brent will likely cite incorporating various streams of crude in West Africa and Russia as a solution to declining North Sea production – we would argue that adding foreign grades to the Brent stream would not work for a plethora of reasons. Aside from Urals, the refiners in Northwest Europe are not the natural buyers of large volumes of crudes from outside the region especially those from West Africa. There is also the pricing of political risk through the inclusion of such grades into the North Sea Dated Brent complex. In a recent report on the Brent Oil Price Marker by Consilience Energy³ it was stated that the grades included in Brent (Brent, Forties, Oseberg and Ekofisk) are already struggling with the quality differences in the existing BFOE basket. The sulphur de-escalator was introduced to compensate for the declining quality of Forties following the inclusion of Buzzard Crude into the system. Then there were the quality premiums for Oseberg and Ekofisk to encourage deliveries of a wider range of crudes and to compensate for the declining Forties production.

According to Consilience Energy Advisory Group, a refiner that buys a cargo of 25-day BFOE currently knows that it will receive a cargo of 600,000 barrels of one of the four deliverable grades – Brent, Forties, Oseberg and Ekofisk and will have to ship that oil for a minimum of 364 nautical miles and a maximum of 748 nautical miles (see table). Where grades of Crude oil are included from outside the region, the complexity and cost related to the shipment of such crudes increases substantially. Moreover, we would also note that because of the stressful conditions often present in the North Sea, leading to shipping delays or the need for platform maintenance, BFOE shipments can be less dependable than other sources of oil, and these unplanned delays can be viewed as a cost to refiners.

Table 2: Distances from the Port of Rotterdam

<table>
<thead>
<tr>
<th>Nautical Miles</th>
<th>Rotterdam</th>
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<tbody>
<tr>
<td>Sullom Voe (Brent)</td>
<td>748</td>
</tr>
<tr>
<td>Hound Point (Forties)</td>
<td>502</td>
</tr>
<tr>
<td>Sture (Oseberg)</td>
<td>569</td>
</tr>
<tr>
<td>Tees-side (Ekofisk)</td>
<td>364</td>
</tr>
<tr>
<td>Bonny, Nigeria</td>
<td>4,946</td>
</tr>
<tr>
<td>Ust-Luga, Baltic (Urals)</td>
<td>1,482</td>
</tr>
</tbody>
</table>

Source: Consilience Energy – the Brent Oil Price Marker (published March 2014)

In very simple terms were Bonny Light or Urals added to the BFOE basket, a refiner in Rotterdam could potentially face a freight cost for up to nearly 5,000 miles to cover the cost from the load port in Nigeria to the Port of Rotterdam. Therefore any buyer would not only look for compensation for the higher quality of Crude (in the case of Bonny Light compared to say Forties) but they would also look for some form of compensation to cover the higher freight cost to ship the oil from the FOB load port. Each refiner, depending on location would face a completely different set of economics.

The final point is one of timing variances between the time that North Sea crudes are traded and the time that non-North Sea crudes are traded. Whilst the changes to the timings of when North Sea grades are traded (moving from 21-days initially to 25-days and to month ahead in March 2015) could possibly allow for the inclusion of non-North Sea grades Consilience argue that this would not be what North Sea producers, refiners and trades want to see happen.

Brent-WTI Spread

There is an interesting tale of two production stories between Brent and WTI- that will undoubtedly affect the Brent-WTI spread in meaningful ways. Brent production is declining, while US and WTI production is increasing. The factors that are affecting the spread and will continue to do so moving forward go beyond production levels. Transportation infrastructure, along with imports and exports and related legislation will all impact the Brent-WTI spread. While east coast refineries in the US can import North Sea crude, they can also take in Bakken oil by rail – with a roughly $10/barrel rail cost – suggesting that this rail costs sets a soft upper bound of the price spread between the two oils. Adding to the dynamic relationship is US imports and exports of petroleum products – with exports being way up and imports being down. Furthermore, with the very recent relaxation of restrictions on crude exports from the US – partially processed condensate is now permitted to be exported – changing dynamics are afoot. We do not want to overemphasize this development however, as WTI crude is still not permitted for export.

US Oil Petroleum Products: Imports and Exports

Source: US Energy Information Administration, Sourcekeys MTTIMUS1 (Imports) and MTTEXUS1 (Exports).
One hindrance to expanding US exports, and a friction in the global oil markets, is the prohibition on direct exports of crude while allowing refined products to be sold abroad. Recent developments in regards to crude exports in the US suggests that global oil market dynamics could shift to even tighter relationships among various benchmarks if the US was to permit unrefined crude oil exports.

Additionally, both Brent and WTI are impacted by geopolitical issues, and we would argue, equally so – based on what has been demonstrated with the turmoil in Iraq as of late. This is a significant change from when infrastructure around WTI was congested in such a manner that WTI markets responded slightly different to global dynamics than Brent. Indeed, we would argue that without the expanded production in North America over the last decade, the current disturbance in Iraq this June 2014 would have had a much larger impact on global oil prices.

The surge in oil production in North America has certainly introduced some interesting dynamics on the crude oil market. One big uncertainty going forward remains the possibility of crude oil exports from the US. Even now, the requirement of international crudes by US refiners is diminishing forcing producers to seek alternative outlets for the barrels that would have traditionally been imported. The knock on effect, in terms of pricing between the US, the Atlantic Basin and Asia, could result in much greater volatility in the pricing relationships between each region. Investment in the North Sea is continuing to decline as producers face increasingly poor returns on their investments compared to other regions in the world. The existing status of Brent as a key Crude oil benchmark would seem to be under threat without a major boost to production of the grades that underpin it.

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