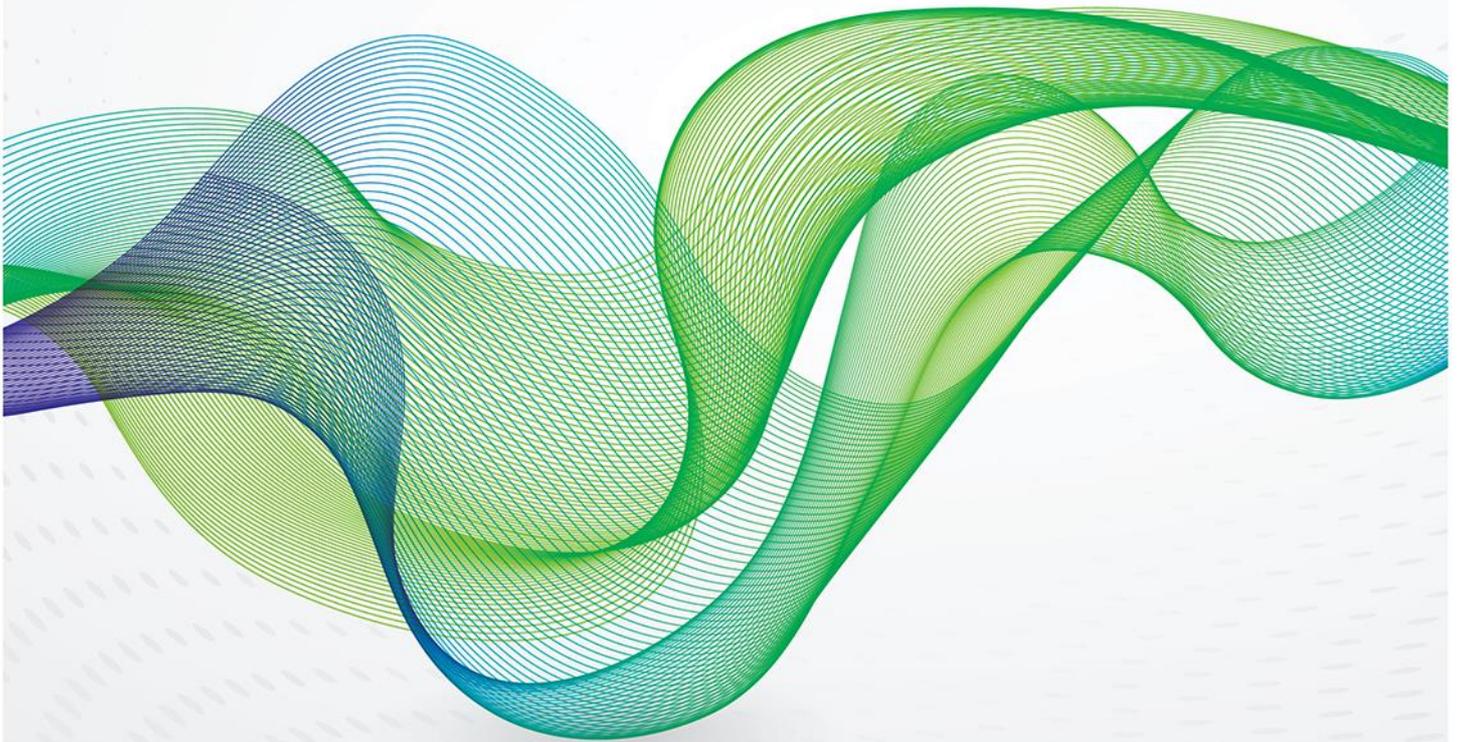




THE OXFORD
INSTITUTE
FOR ENERGY
STUDIES

March 2019

Changes to the 'Dated Brent' benchmark: More to come



OXFORD ENERGY COMMENT

Adi Imsirovic, OIES Research Associate



Introduction

On 25 February this year Platts, a division of S&P Global, announced the inclusion of delivered, or CIF (Cost, Insurance and Freight), Rotterdam offers of North Sea oil cargoes into its flagship Dated Brent¹ benchmark starting from 1 October 2019. Competing price reporting agency (PRA) Argus is already publishing its 'New North Sea Dated' assessment (this includes delivered assessments of non-North Sea grades) and is likely to officially adopt it as a methodology behind its 'North Sea Dated' index in July this year. These moves may represent the biggest changes to a major global oil benchmark this century.² The changes are necessary for two main reasons: the fall in North Sea production and trade and the increase in Europe's oil imports from the USA.

This Comment will discuss the current state of the Dated Brent benchmark, the impact of declining volumes of oil included in the price assessment process, and the increasing flow of US oil exports to Europe. It highlights the following:

1. There is a persistent need to ensure that a sufficient volume of physical oil continues to be included in the 'Dated Brent' benchmark.
2. The inclusion of delivered or CIF assessment in the benchmarks may well be the only viable long-term solution for a healthy Dated Brent brand.
3. US flows to Europe are becoming large enough to impact North Sea activity, as they compete directly with BFOET³ grades.
4. The inclusion of delivered WTI in Rotterdam in the assessment process is perhaps the next obvious step that Platts may have to take.

Assessing the 'Dated Brent' benchmark

Arguably, 'Dated Brent' is the world's most important oil benchmark. It dominates as a pricing reference for the Atlantic basin (North Sea, Mediterranean, and Africa) and for most 'sweet' (low sulphur) crude in Asia (Australia, Malaysia, Vietnam, and others). It is generally accepted that Dubai, the main benchmark 'East of Suez', is regularly traded as a spread to Brent. Brent has evolved from being a forward market in physical cargoes in the 1980s, to become the most complex oil market in the world.⁴ In a nutshell, the assessment of the Dated Brent benchmark is based on four pillars:

- Physical assessment of BFOET grades.
- A forward curve based on the Dated swaps market.
- The fixed price of the forward or futures 'Brent' contract.
- Quality differentials on crudes other than Brent or Forties.⁵

The most peculiar feature of the physical BFOET market is that it is generally traded as a differential to Dated Brent. Therefore, the PRAs are challenged to assess the Dated Brent value on the basis of physical trades which are themselves differentials to Dated Brent! Fortunately, the expected assessments for Dated Brent are traded in a liquid derivatives market as weekly swaps,⁶ called

¹ 'Platts inclusion of CIF Rotterdam cargoes in Dated Brent – FAQ', S&P Global Platts, February 2019: <https://www.spglobal.com/platts/plattscontent/assets/files/en/our-methodology/methodology-specifications/dated-brent-cif-rotterdam.pdf>. Dated is prompt (10 to 30 days forward) oil, loading in a three-day laycan scheduled by the operator.

² Forties and Oseberg were introduced into the Brent benchmark in 2002. CIF Rotterdam quotation was introduced in 2015 as a separate, independent assessment, with no bearing on Dated Brent.

³ We shall use 'Brent' as a brand that encompasses the BFOET grades (Brent, Forties, Oseberg, Ekofisk, and Troll) and use the two interchangeably.

⁴ For a historical overview, see R. Mabro and P. Horsnell: *Oil Markets and Prices, The Brent market and the Formation of World Oil Prices*, OUP/OIES 1993. See also, B. Fattouh (2010) 'An Anatomy of the Crude Oil Pricing System', OIES Paper WPM 40.

⁵ Forties has a de-escalator; see footnote 7 on the next page. Quality premiums are discussed in the next section.

⁶ It is assessed on a weekly basis, because oil in Europe traditionally prices over a five-day range, usually around the 'bill of lading'.



Contracts for Difference or CFDs. CFD Brent swaps are differentials between Dated and forward Brent values.

For example, 1–5 April CFD swaps may trade at June forward Brent, minus 50 cents per barrel (–\$0.50). The following week (8–12 April), they may trade at –\$0.30, and so on. PRAs need to establish these values (forward curve) as they are the key to resolving the above conundrum. Let's take an example of a cargo of Forties crude, loading 2–4 April, traded at Dated+\$0.50/bbl and another cargo of the same grade loading 9–11 April traded at Dated+\$0.30/bbl. Given the above CFD values, they have both effectively traded at the same flat price, equal to June forward Brent (–\$0.50 + \$0.50 = 0 and –\$0.30 + \$0.30 = 0). The actual value for June forward Brent is established at the end of a 'window' at 16.30 London time.⁷

The higher quality grades in the BFOET basket such as Ekofisk, Oseberg, and Troll have a quality premium (QP) applied⁸ to 'normalize' the differentials for the assessment process. Brent's most representative grade is usually Forties – due to its relatively, but not exclusively, high sulphur levels – and it commonly establishes the value of Dated Brent. The quality of Forties crude may sometimes vary depending on the contribution of the Buzzard field, and a sulphur de-escalator is applied later, to compensate buyers when the level of sulphur is above 0.6 per cent.⁹ This whole process happens in the London 'window' between 16.00 and 16.30 BST, with most trades being done in the last minute of the 'window'.

Above is a somewhat simplified rendition of the process.¹⁰ What is clear is that derivatives markets play an important role in establishing the value of Dated Brent. Hence sometimes the criticisms that 'the (derivatives) tail is wagging the (physical crude oil value) dog'.¹¹

Falling BFOET output

Brent production has been falling for some time.¹² Figure 1 clearly shows that the inclusion of the grade Troll into the basket was just a temporary fix. Figure 2 shows the loading programmes of the BFOET grades for April 2019 with their equity producer(s), cargo numbers, and loading date ranges. As can be seen from the first column, the Brent blend programme consists of only five cargoes (600,000 barrels each). That is only 3 million barrels in total, or 100,000 b/d. The physical oil underpinning the benchmark has been maintained by adding alternative delivered grades: Forties (introduced in 2002, with Buzzard field entering production in 2007), Oseberg (2002), Ekofisk (2007), and most recently Troll (2018). What is left of Brent blend crude oil, loading at Sullom Voe terminal, is now just a brand name.

Physical volumes of oil in the 'Brent basket' have also increased over time by widening the 'window' of cargo loadings which qualify for the price assessment of Dated Brent. From the beginning, in 1987, to 2002, the 'window' was up to 15 days ahead of the date of assessment (often referred to as 15-day Brent); in 2002, the window was expanded to 10–21 days ahead; in 2012 it was expanded to 10–25 days ahead; finally, in 2015, it was extended yet again to a 10 days–one calendar month forward 'window'. This added to the volume of oil trade included in the assessment.

⁷ For exact specification see: 'Platts Methodology and specifications guide Crude oil', S&P Global Platts, January 2019: <https://www.spglobal.com/platts/en/our-methodology/methodology-specifications/oil/crude-oil-methodology> and 'Argus Methodology and Reference Lists': <https://www.argusmedia.com/en/methodology/methodology-listing?page=1>.

⁸ It is applied at 60% of an established premium between Oseberg and Ekofisk and the cheapest grade. Troll QP was introduced in March 2019; see 'Platts Methodology and specifications guide Crude oil', January 2019.

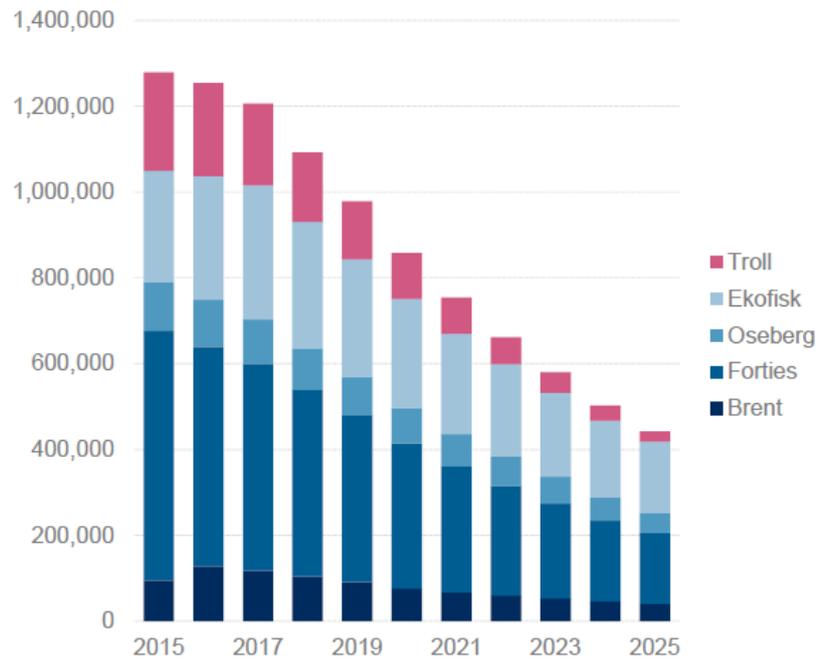
⁹ To compensate the buyers for sulphur levels over 0.6%. See: 'Methodology and specifications guide North Sea sulfur de-escalator', S&P Global Platts: https://www.spglobal.com/platts/plattscontent/_assets/_files/en/our-methodology/methodology-specifications/northseadeescalator.pdf.

¹⁰ For now, we shall avoid discussing the issue of EFP in Platt's methodology. Traders hedging their physical oil with futures and CFDs take additional EFP risk as CFDs are based on the Dated and forward Brent differential and not on the Dated and futures Brent differential!

¹¹ The author does not share this view; see 'Do not blame PRAs for oil industry structural failures', *Financial Times*, 20 May 2013.

¹² Especially sharp declines were seen in the early 1990s.

Figure 1: Dated Brent Basket with Troll (b/d)



Source: Platts

However, in spite of all these efforts, the volumes of BFOET or ‘Brent’ kept declining. In April 2019, the volume of production acceptable in the benchmark was 920,000 b/d. This means that, during regular field maintenance in the summer, the volume of oil available for price assessment of Dated Brent could fall well below 800,000 b/d (or about 40 cargoes in a month), which is usually considered the minimum needed to ensure the benchmark’s liquidity and its integrity.¹³

Benchmarks tend to evolve, and a shift to alternative pricing arrangements is often not readily accepted by the trading community. Back in March 2016, Platts launched a new assessment: Dated Brent CIF Rotterdam. The prices have been published ever since, but have not been used much by the trading community. However, this now well-established procedure – making the delivered price assessments using daily published freight values – may prove invaluable in tapping into this extra liquidity and transitioning to the next step: the inclusion of other delivered grades into the ‘Brent’ basket. Another major market development, the shale revolution, may facilitate just that.

¹³ Not all of those cargoes necessarily appear in the spot market. As the volumes fall, it becomes easier for any single player to ‘leverage’, or influence, the price.

Figure 2: BFOET loading Program in April 2019

Date	Brent	Forties	Forties	Oseberg	Ekofisk	Ekofisk	Troll
01/04/19	BP	BP		Equinor	ENI		
02/04/19	B0304	F0401	Conoco		C12413		
03/04/19			F0402			Shell	
04/04/19		CNOOC				C12412	
05/04/19		F0403	BP		Total		
06/04/19		F0404			C12415		Equinor
07/04/19		Total				Conoco	T0401
08/04/19		F0405		Equinor		C12405	
09/04/19	Shell		Suncor	O0302	BP		DEA/Ide/Okea/Shell/W'Shall
10/04/19	B0401	BP	F0406		C12408		T0402
11/04/19		F0407					
12/04/19			Shell		Equinor		
13/04/19			F0408	Equinor	C12411		Equinor
14/04/19		CNOOC		O0302			T0403
15/04/19	Mercuria	F0409	ENI		BP		
16/04/19	B0402		F0410		C12409		Equinor
17/04/19		Chevron					T0404
18/04/19		F0411			Conoco		
19/04/19			BP	Equinor	C12406		
20/04/19			F0412	O0302			Conoco/Equi/Spirit
21/04/19		Shell			Total		T0405
22/04/19	Mercuria	F0413	Suncor		C12416		
23/04/19	B0403		F0414				Neptune
24/04/19		BP		Equinor	ENI		T0406
25/04/19		F0415		O0302	C12414		
26/04/19	BP		CNOOC				Equinor
27/04/19	B0404		F0416		BP		T0407
28/04/19		Exxon			C12410		
29/04/19		F0417		Equinor		Conoco	Equinor
30/04/19				O0302		C12407	T0408
01/05/19							
CARGOES	5	17		6	12		8
Barrels (thousand barrels)	3,000	10,200		3,600	7,200		4,800

Notes: Each cargo is 600,000 barrels

Source: Author compilation based on Bloomberg.

Growing US oil exports to Europe

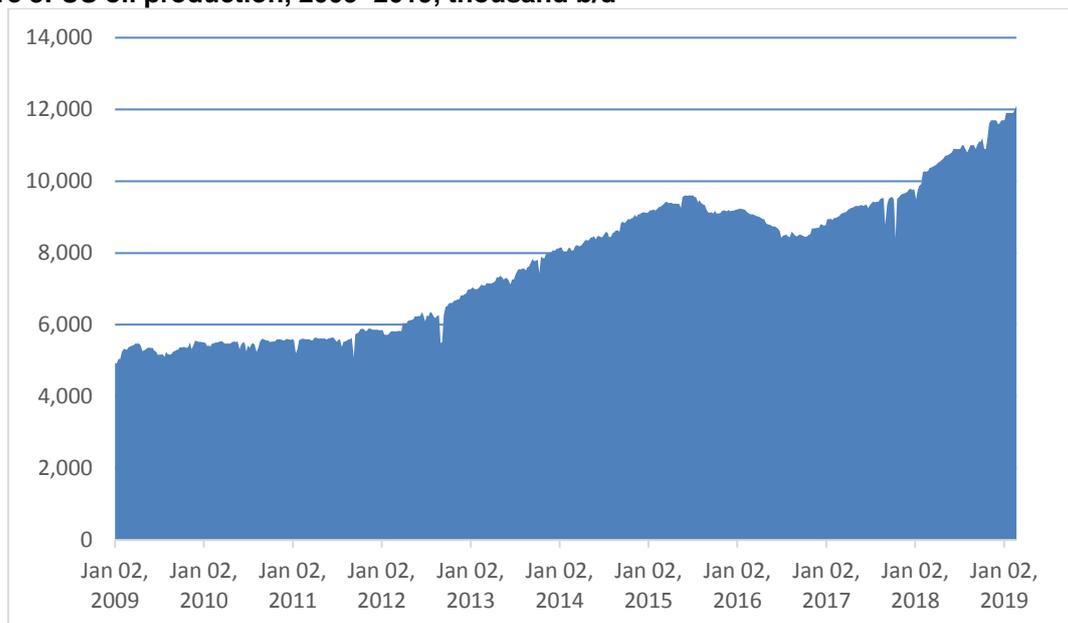
The US shale revolution has been unprecedented. According to the International Energy Agency (IEA), the US shale production has resulted in:

‘... the fastest growth in oil production in a single country since the development of Saudi Arabia’s super-giant oilfields in the 1960s.’¹⁴

Supported by high oil prices for much of 2011–2014 as well as massive technological progress and investment, US shale output more than doubled. Figure 3 shows the relentless increase in US oil production.

The lifting of the US export ban at the end of 2015 caused a major change in crude oil flows. Traditionally an importer of light, sweet oil from Europe and West Africa, the USA suddenly became an exporter of crude of a comparable oil quality. Fast-growing economies in Asia were happy to absorb these volumes, enabling them to widen their sources of supply and improve energy security. European refineries were also happy customers. The shorter sailing distance, very liquid and transparent markets, as well as lower credit risk, made them an obvious target for US oil exporters. As Figure 4 below illustrates, almost 700,000 b/d of US crude exports have been reaching Europe in recent months (and possibly even more than this figure in early 2019 according to some estimates).¹⁵ Given that this volume is expected to grow, it may soon exceed the volumes of BFOET oil in the ‘Brent’ basket.

Figure 3: US oil production, 2009–2019, thousand b/d



Source: Argus

US oil exports, once loaded on a ship at the US Gulf Coast, essentially ‘becomes Brent’ in the sense that it is of similar quality, but also because Brent is the main pricing reference point for exports both to Europe and Asia. Due to its similar quality, WTI competes directly with lighter grades in the BFOET basket, particularly Ekofisk and Oseberg. In the Mediterranean, it competes directly with Saharan blends.

The USA has been by far the largest oil consumer and, until recently, has been the largest net oil importing nation in the world. Having a benchmark set in Cushing, Oklahoma made sense. Cushing

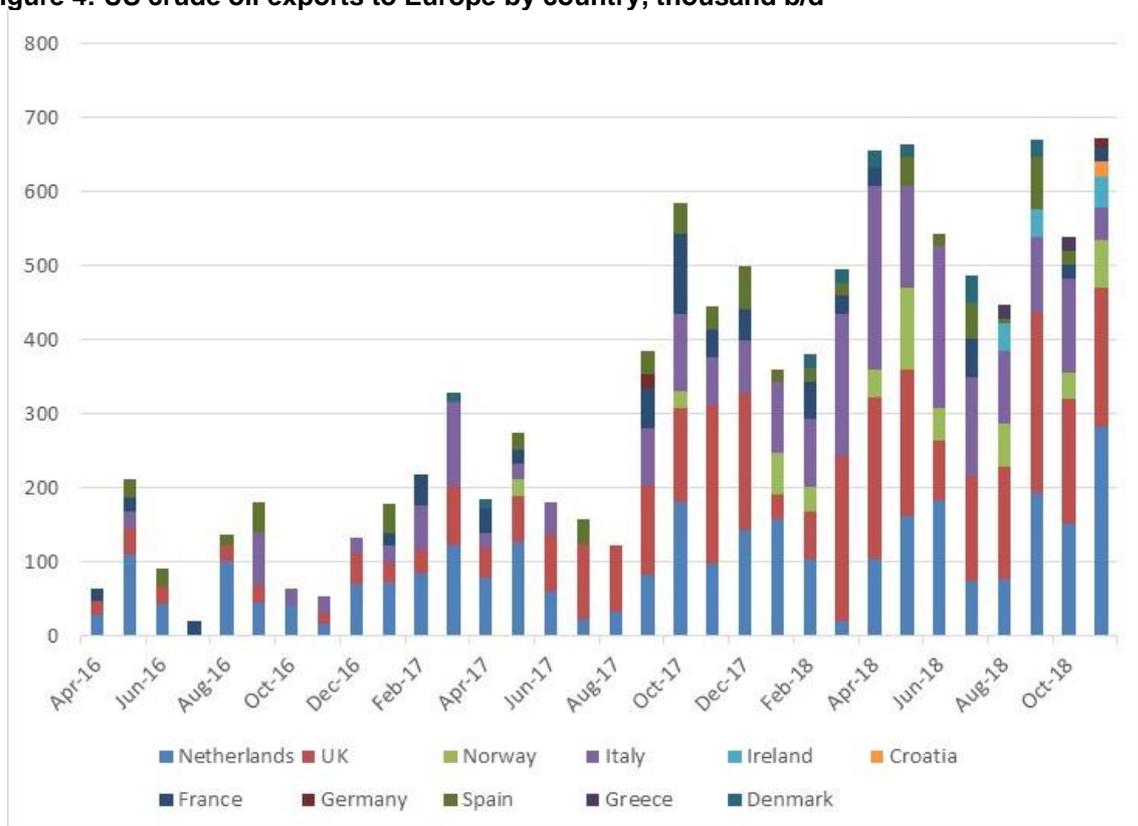
¹⁴ ‘Investment Analysis: The journey of US light tight oil production towards a financially sustainable business’, IEA, 26 July 2018.

¹⁵ Preliminary tracking by Kpler indicate volumes averaging 900 kbd in March this year.

was a crossroad of pipelines moving domestic US production (WTI), as well as imported oil, to the inland refineries. With the lifting of the US oil export ban in 2015 and rapid output growth resulting from the shale revolution, the price of oil at one of the export hubs, such as Houston, increasingly made more sense to international buyers. What is more, the available pipelines from Midland, Texas could not handle the growth of shale output; this isolated the Cushing hub and made WTI priced there a less relevant global price indicator.

Due to exports, Houston has emerged as the new important pricing point. Both PRAs (Argus and Platts) have developed price assessments there: Argus and CME focused on WTI Houston (Permian), while Platts and ICE focus on WTI delivered in the Magellan East Houston (MEH) terminal.¹⁶ So far, these contracts are essentially a differential to WTI Cushing, but their introduction has substantially helped to improve price discovery for all the buyers in Europe and Asia. In the long run, they may also become global benchmarks.¹⁷

Figure 4: US crude oil exports to Europe by country, thousand b/d



Source: Argus

Dated Brent CIF Rotterdam

As Figure 4 shows, European imports of US oil have reached a level where they are competing with North Sea and Mediterranean grades. In Northwest Europe (NWE), WTI mainly competes with Statfjord, Oseberg, and Goliat, while in the Mediterranean it replaces CPC and Saharan Blends.¹⁸

¹⁶ The new CME WTI contract is delivered at Houston terminals owned by Enterprise Products Partners, with API within 40–44 degrees, and sulphur content of max 0.275% plus maximum metal content of four parts per million of nickel and vanadium. ICE's contract is delivered at Houston terminals owned by Magellan Midstream Partners, with API within 36–44 degrees and a sulphur limit of 0.45%.

¹⁷ Currently, they lack some attributes of true benchmarks – for detailed discussion see, 'There Can(not) be Only One', Liz Bossley, *Oxford Energy Forum*, OIES, Issue 113, May 2018.

¹⁸ The main export grade has been WTI, while Bakken, Eagle Ford 45, Eagle Ford 60, Domestic Sweet, and Mars have also been offered, or exported, in smaller quantities.

The impact has been taken seriously by the PRAs, which have started assessing delivered prices of US grades in Europe. In September 2018, Platts started publishing assessments for WTI Midland and Eagle Ford 45 delivered in Rotterdam and Augusta. Argus also publishes CIF Rotterdam prices for a number of grades such as Azeri BTC, Nigerian Escravos, Bonny Light, and Qua Iboe as well as Algerian Saharan Blend and WTI–Permian quality delivered to Rotterdam.

In February this year, Argus introduced a ‘New North Sea Dated’ assessment which will take into account delivered Rotterdam prices for the above six grades.¹⁹ In July, subject to positive market feedback, Argus could make this methodology the basis of its main ‘North Sea Dated’ index. It is interesting that, in the first few days of this index, WTI was very competitive and became one of the main grades setting the price of the ‘New North Sea Dated’, reflecting its competitiveness in the European market.

Table 1: ‘New North Sea Dated’ Assessment

\$/bbl	North Sea Dated (BFOET only)	New North Sea Dated (including adjusted CIF elements)	Premium of North Sea Dated to New North Sea Dated	What sets New North Sea Dated?
15/02/2019	65.78	65.19	0.59	WTI
18/02/2019	66.48	65.66	0.82	WTI
19/02/2019	65.99	65.16	0.83	WTI
20/02/2019	66.84	66	0.84	WTI
21/02/2019	66.98	66.12	0.86	WTI
22/02/2019	67.04	66.26	0.78	WTI
25/02/2019	64.06	63.95	0.11	WTI
26/02/2019	64.3	64.3	0	Forties
27/02/2019	65.14	65.14	0	Forties
28/02/2019	65.07	65.07	0	Forties
01/03/2019	63.74	63.74	0	Forties
04/03/2019	64.52	64.52	0	Forties
05/03/2019	64.36	64.36	0	Forties

Source: Argus

It can be seen from Table 1 above that WTI set the prices of the new benchmark for most of the second half of February 2019. The resulting benchmark price was substantially lower than the traditional BFOET Argus benchmark.

Given that Platts has traditionally been used to price the settlements of ‘Dated’ swaps, the forthcoming change to its Dated Brent assessment, commencing 1 October this year, is very significant. It will potentially increase the volume of oil deliverable into the benchmark. More importantly, it can be used as a necessary stepping stone for the introduction of WTI into the Dated Brent benchmark. Judging from the Argus experience with ‘New North Sea Dated’, it could increase liquidity, prevent spikes in ‘Dated Brent’, and hence provide an effective ‘cap’ on its price and allow the negotiated differentials to Dated Brent for other grades to remain more stable.²⁰

¹⁹ ‘US waterborne crude trade shifts toward Brent basis’, Argus blog, 15 February 2019:

<https://www.argusmedia.com/en/news/1849242-us-waterborne-crude-trade-shifts-toward-brent-basis>.

²⁰ Though there is a fairly large difference between the Argus ‘New North Sea Dated’ and the new Platts ‘Dated Brent’.

Conclusion

'Dated Brent' is arguably the most important international benchmark. Falling production has seriously eroded the original benchmark, but it has been reinvented time after time by including new grades of oil into the assessment basket and extending the assessment window.

North Sea production continues to fall and there is a very limited number of new regional crudes that can be justifiably added to the existing 'basket'. A large discovery in Norwegian waters, Johann Sverdrup, is due to begin production later this year, but it is much heavier than the Brent-like crudes in the Dated Brent basket. At the same time, the volume of US imports into Europe is growing and is only likely to increase. The Dated Brent benchmark needs to reinvent itself again. The majority of FOB WTI trades in the US Gulf Coast are conducted on a 'Brent' pricing basis. Once it hits the water, WTI becomes 'Brent' from both a trading and a pricing point of view.

Platts' decision to include CIF Rotterdam offers on a freight-adjusted basis into the flagship 'Dated Brent' benchmark was inevitable, and should increase the impact of the main North Sea grades on the Dated Brent benchmark in the near term. It is likely to be just the first step towards the full inclusion of WTI into the same contract as well.