The evolution of North Sea Dated
Joint IEA-IEF-OPEC Technical Meeting
Vienna

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Crude benchmarking around the world
The European crude market

- North Sea production and trade volumes are in decline.
- Eastern arbitrage has significant effect on fob prices.
- Market calls for a more robust methodology have increased.
- There is a large flow of light sweet crude into the region.
- This can be used for additional price discovery.

Output decline slows after steep drop
Trade volumes dwindle, despite added benchmark grades

BFOET trades per month

+ Forties, Oseberg
+ Ekofisk
+ QPs
+ Troll

North Sea far less liquid than US markets

Average daily trade volume underlying benchmark in 4Q 2018

Argus WTI Midland
Argus WTI Houston
North Sea Forwards
Dubai Physical
Argus Mars
BFOET Physical
Argus LLS
Urals NW Europe

Average monthly deal count underlying benchmark in 4Q 2018

Argus WTI Midland
Dubai Physical
ASC
Argus WTI Houston
Argus Mars
North Sea Forwards
Argus LLS
Argus ESPO
BFOET Physical
Urals NW Europe
Forties has gone global – creating a two-tier market

Volatile Forties

Forties differential to North Sea Dated, $/bl
Dated surged against Mideast benchmarks in April...

...just as eastbound loadings peaked
**North Sea Dated can send a volatile signal**

The North Sea benchmark elements:

- **Outright price** (volume weighted average of forward trade)
- **Contracts for Difference curve** (aligns timing with physical date-range 10 days to month ahead)
- **Physical grade differentials for Brent, Forties, Oseberg, Ekofisk and Troll**
- **Quality adjustments to bring more expensive grade components** (Oseberg, Ekofisk, Troll) closer to others
What is the market price in Europe for light sweet crude?

Potential pool of trade – needs transparency
Argus launched cif Rotterdam assessments in Oct 2018

- Observations and feedback - CPC Blend, while liquid, is discounted to other light crudes and there are quality concerns. We have therefore excluded it from the benchmarking process.
- Several grades, not all, require quality premium adjustments in order to be relevant to the benchmark setting process. Exceptions: Saharan Blend and WTI.

New North Sea Dated
- Bonny Light, BTC Blend, Escravos, Qua Iboe, Saharan Blend and WTI cargoes traded on, or normalised to, a CIF Rotterdam basis, confirmed, reported and assessed.
- Assessed for delivery 12 days to one month ahead plus two days.
- Freight deduction Hound Point to Rotterdam, based on past five working days’ assessments.
- This aligns the delivered market with the trading and pricing of FOB North Sea grades, Brent, Forties, Oseberg, Ekofisk and Troll.
- Quality adjustments at 60pc of difference between grade and lowest in basket (on FOB basis) two months previous to month of publication, for all grades in basket except Brent, Forties, Saharan Blend and WTI.
The new benchmark’s performance

North Sea Dated and New North Sea Dated, $/bl

The new benchmark’s elements

Dated components on a fob Nsea basis

See p.6 of Argus Crude and crude methodology documents at argusmedia.com/methodology
The new benchmark’s elements

Components of North Sea Dated, $/bl

illuminating the markets

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What sets New North Sea Dated

Benchmark-setting grades 2018

- Brent: 12%
- Forties: 8%
- Ekofisk: 22%
- Troll: 3%
- Bonny Light: 6%
- Escravos: 2%
- Saharan: 3%
- WTI: 43%

Benchmark – setting grades since launch

- WTI
- Forties
- Ekofisk

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Implementation timetable

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Q4 ‘18</th>
<th>Q1-2 ‘19 starting 15 Feb</th>
<th>Q3 ‘19 starting 1 Jul</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>North Sea Dated (current)</td>
<td>Application of new methodology to North Sea Dated</td>
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Consultation period

New assessments

CIF Rotterdam assessments | New North Sea Dated runs as parallel quote | FOB methodology continues as Argus Dated BFOET

- Argus conducted a consultation process throughout quarter 4 2018.
- Argus will continue to publish the full range of current assessments. CIF Rotterdam does not replace FOB Ceyhan, FOB Bonny terminal, etc.
- The Argus North Sea crude benchmark will continue to be called North Sea Dated and published in the Argus Crude report. We will continue to publish a price without CIF elements, which will be called Argus Dated BFOET.

A representative benchmark helps all

- Liquidity and transparency aids the price discovery process.
- Refiners benefit from a market in which regional and imported grades are competitive with one another.
- Producers can set differentials with confidence.
- Traders can judge the arbitrage between regions.
In summary

- The North Sea Dated benchmark has become volatile and is regularly driven by factors outside the region.

- Asian demand, particularly for Forties and Ekofisk, can reduce the number of cargoes available for price identification.

- There is a steady flow of competing light sweet crude being delivered into the European market.

- If this trade is reported and assessed, it can be integrated into a more representative incarnation of the benchmark.