EUROPEAN CRUDE QUALITY
THE PAST, PRESENT AND FUTURE

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COQA Meeting Sugar Land (October 2018)

This talk reflects my personal information and thoughts and not those of Intertek
INTRODUCTION

• European refining has been stressed for at least four decades

• Product imports from Russia, U.S. and the Middle East

• Refining sector has problems of: overcapacity, underutilization, narrow margins and shifting ownership

• Resulted in: capacity cuts, plant shutdowns and conversion to storage facilities (accelerated by the recent financial crisis)

• **What is the outlook for the industry in Europe?**
EARLY YEARS

- European refining was driven by the standard need to supply products to communities and fuel oil to power plants

- The 1960’s saw strong refined product demand growth – refining capacity was increased to meet demand

- Second oil price crisis (1979 – 80) however caused a sharp price increase and subsequent sharp decrease in consumption
  - This led to the overcapacity still seen today...

- Additional factors:
  - Natural gas from Russia disrupted domestic gas oil demand
  - Nuclear energy decreased need for fuel oil
  - Tax incentives shifted fuel demands from gasoline to diesel
  - Middle Eastern producers increased refining capacity to capture more supply chain value
• Refineries were optimised on the diets of Brent, Urals and Middle Eastern crude oils with little focus on feedstock flexibility.

• This is reflected in the import breakdown by region.

• North and South Europe experience different competitive market forces:
  • North Europe – Refineries compete heavily with each other
  • South Europe – Refineries compete with ME refineries

Source: European Commission 2018
• Although Europe suffers from overcapacity the industry has been remarkably resilient

• From 1992 to 2015 the number of plants decreased from 137 to 97 (-29%)

• In the same period refining capacity decreased from 15.4 mbpd to 14.5 mbpd (-6%)

• Refining utilisation remained at a steady 12.1 mbpd
A variety of factors contributed to this interesting and unexpected trend:

- Some refineries invested heavily in boosting middle distillate production.
- National security.
- Strong labour unions (particularly southern Europe).
- High environmental liability (operating at break even).
- Legacy refineries are already fully depreciated.
- Localised insulation from external competition (few product pipelines).
RATIONALISATION

- Rationalisation was accelerated by the 2008 financial crisis and the 2009 – 14 market downturn, resulting in 2.35 mbpd of retired refining capacity.
  - 1.05 mbpd converted into storage terminals, logistics hubs or biodiesel plants
  - 1.3 mbpd entirely or partially closed

- Of the retired refineries, many had catalytic cracking and reforming capacity but lacked fuel oil conversion capacity – limiting ability to run wide range of crudes

- This is actually very limited, estimates suggest another 1.5 – 2 mbpd still needs to be lost to equilibrate the market

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<thead>
<tr>
<th>OECD Europe Closures &amp; Conversions (2009-2015)</th>
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<td>Announced Conversions / Converted (Storage / Biodiesel)</td>
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<td>1,050 kbdp</td>
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<tr>
<td>Teesside (Petroplus)</td>
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<td>Dunkirk (Total)</td>
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<td>Reichstätt (Petroplus)</td>
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<td>Cremona (Tamol)</td>
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<td>Roma (TotalERG)</td>
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<td>Milford Haven (Murphy Oil)</td>
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<td>Announced Closures / Closed</td>
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<td>Arpechim (Petrom)</td>
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<td>Harburg (Shell)</td>
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<td>Barre (LyondellBasell)</td>
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<td>Coryton (Petroplus)</td>
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<td>Total: 2,350 kbdp</td>
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Source: Opportune
Europe is experiencing a decline in refined product demand with a steady -3%/annum - now stabilised at approximately 14 mbpd (driven by decline in use of gasoline, jet and diesel stable since 2013).

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CHALLENGES

Structural problems continue to be a challenge for European refineries

- Europe is long on gasoline (exports 1 mbpd 1/3 of the output) but short on diesel (imports 1.5 mbpd 1/5 of consumption)

- Investments have focussed on increasing diesel production but newer, more sophisticated refineries in other regions supply the market with middle distillate
  - Modern and large scale middle east refineries (economy of scale, lower opex)
  - Russian refineries have been upgraded and export Euro grade diesel (10ppm Sulphur)
  - Complex US refineries have ready access to lower cost feedstock

- Low distillate output remains a challenge, European refineries have limited fuel oil upgrading capacity

- EU legislation – emissions regulations/biofuel content
It seems that the future of European refining is looking towards asset backed trading models

- Refiners shifting emphasis from marketing to trading
- Traders acquiring refining assets

This allows for improved revenue and more stable returns (returns on trading not a direct function of the level or direction of oil prices or refining margins)

Europe is also geographically well suited to become a clearing hub for refined products, allowing refineries to be utilised for logistics as well as processing

Speaking of which... what part does US oil play in this?
• U.S. oil exports grow to average of 1.1 mbpd in 2017

• Double the average of 2016

• Facilitated by both increased production and better infrastructure

Source: EIA
US OIL IN EUROPE (2)

What makes up that 6%??

Source: European Commission
• In 2017 U.S. oil went to 37 destinations, compared to 27 in 2016

• Canada continues to be the largest importer BUT this was down from 61% in 2016 to 29% in 2017

• Many European destinations are on the list – UK is third biggest importer

Source: EIA
Despite importing large amounts of North American oil, the UK could become a net exporter (first time in 14 years)

- Average output was 914,000 bbl./day in 2017

- Boosts have come from:
  - Quad 204 (130,000 bbl./day)
  - Catcher (60,000 bbl./day)
  - Claire Ridge/Mariner
Despite terrific challenges the European market continues to show resilience and go from strength to strength to survive.

Product demands have shifted and the refineries have taken a variety of strategies to deal with this.

The IMO 2020 legislation is the next hurdle which will need to be addressed.

The advent of US shale in the marketplace has caused challenges but also created opportunities.

The reliance is still on the traditional regions for feedstocks.... For now....

The U.K. could become a net crude oil exporter for the first time in 14 years (we could join OPEC!)
25th July 2018 Intertek hosted the first European Crude Quality forum, in conjunction with the COQA, in Aberdeen, United Kingdom

The purpose of this was to try to replicate the models of the COQA and CCQTA and encourage stakeholders throughout the hydrocarbon supply chain to share successes

We were very honoured to have Dennis Sutton as our keynote speaker

Other talks were given by Essar Energy, Infineum, Lux Assure and (of course) Intertek
Surveys were conducted before and after the event to gauge audience interest

Being a predominantly upstream client base it can be seen that the initial reactions were that MEG and Methanol would be of most interest...

...However, after the event the voting was very different

This was a great success and of course we cordially invite everyone to attend next year's to be hosted at [INSERT VENUE HERE]
THANK YOU

FOR PRESENTING AT THE FIRST INTERTEK FORUM

ON CRUDE QUALITY
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