So, what have we learned?

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Options for the ECA

• Gas oil 0.1% S – Already in use for some years.
• DMB 0.1% S – Hybrid product, incorporating some Vacuum Gas Oil (VGO)
• RMB 30 0.1% S – Hybrid product, mainly VGO, elevated density.
• RMD 80 0.1% S - Hybrid product, mainly VGO, elevated pour point.
• All are refinery / Supplier specific so availability is geographically restricted.
Testing issues

• The hybrid fuels can be difficult to assess.
• Should we use test methods intended for use with distillates or those intended for residual grades?
• The testing laboratories are using their own judgement at this time.
Players, Pros and Cons

- Suppliers include – ExxonMobil, Shell, BP, Lukoil, Stena, FastOil, Cepsa, SK Energy and others.
- The fuels perform well in the engines (medium and slow speed)
- Few problems reported co-mingling with gas oil.
- Advice on co-mingling with residuals – Max 98:2 ratio. Must be heated, must be purified
- On board segregation is the main issue – not many adopters so far.
- Points to note, Hybrid analysis represents 3% of the total fuels tested.
- Also note that the distillates (DMA and DMB) now represent 33% of the total fuels tested (last year it was less than 10%, historically it was less than 5%).
Target consumers?

• Vessels spending a significant % of time in an ECA (> than 70% of time)
• Vessels with regular calls in ports with availability.
• Vessels with sufficient tanks to permit segregation of parcels without affecting steaming range.
• Vessel operators with experienced technical support staff.
Co-mingling issues

• The fuels will generally need heating and purifying.

• The pour point and fuel chemistry mean that there are issues in mixing with other hybrid fuels.

• They will generally mix with “on spec” DMA gas oil however all sellers advise caution.
Any special advantages?

- It has a much higher viscosity than gas oil.
- It is highly paraffinic with good ignition and combustion properties.
- It has good lubricity.
- It is coloured green - so it looks kind of “neat”!
Results from one analysis co. Q1 and Q2 2015

• 405 test results of RMD80 Hybrid fuels.
  – Average Density 887 (range 833 to 949) kg/m³
  – Average Viscosity 24.9 (range 2.6 to 84) cSt @ 50 °C
  – Average MCR 2.6 (range 0.01 to 8.6) %
  – Average Al + Si 7 (range 2 to 32) mg/kg
  – Average Pour 17.9 (range -12 to 33) °C

• 12 test results of RMB30 Hybrid fuels

• All out of 15173 total samples of which 5771 were DMA or DMB distillates.

Data provided by Intertek ShipCare
What fuel are there?

- Hybrid RMD80
- Hybrid RMB30
- Hybrid RMA10
- Hybrid DMB
- Conventional LS DMA
- Alternatives?
  - Methane
  - Bio diesel
Where are the hybrids?

- Baltic Sea (Russia, Finland, Sweden, Norway, Estonia, Latvia, Poland, Germany and Denmark)
- North Sea (Netherlands, Belgium, France, UK)
- Northern Mediterranean (Spain, France, Malta)
- USA (Atlantic coast, Gulf coast, West coast)
- Caribs / South America (Curacao*, Chile*)
- Canary Islands
- East Asia (South Korea, Hong Kong, Japan, Singapore*)

Those marked * are RMA or RMB 0.1% but may not be hybrid
Where is the Methane?

- Baltic Sea (Finland, Sweden, Norway, Poland, Germany and Denmark)
- North Sea (Netherlands, Belgium, France, UK)
- Northern Mediterranean (Spain, France)
- USA (Atlantic coast, Gulf coast, West coast)
- South Korea
- On the horizon
  - Italy, Malta, Greece, Turkey, Fujairah, Singapore, Japan
- RTW supply routine at many locations, barge delivery in its infancy.
Bio diesel

• Widely available in Europe and the USA by RTW.
• Still seen as problematic on the basis of cost, storage on board and a need to modify engines for 100% bio diesel.
• Carries a cost disadvantage, subsidies for road transport are via taxation – not workable for international shipping as yet.
Low sulphur DMA

• Very widely available in Europe and the Americas.
• More difficult to source in Africa and the Middle East.
• Some availability in East Asia
• Availability increasing as nations adopt Ultra Low Sulphur diesel for automotive use.
My conclusions

• Hybrid fuels continue to be a minority product, suitable for some vessels and some trades.
• Methane (stored as LNG) is gaining traction but uptake for deep sea will be gradual.
• Bio diesel need subsidies to succeed and there are still operational hurdles to cross
• Scrubber uptake is accelerating