High viscosity and low sulphur fuel trends

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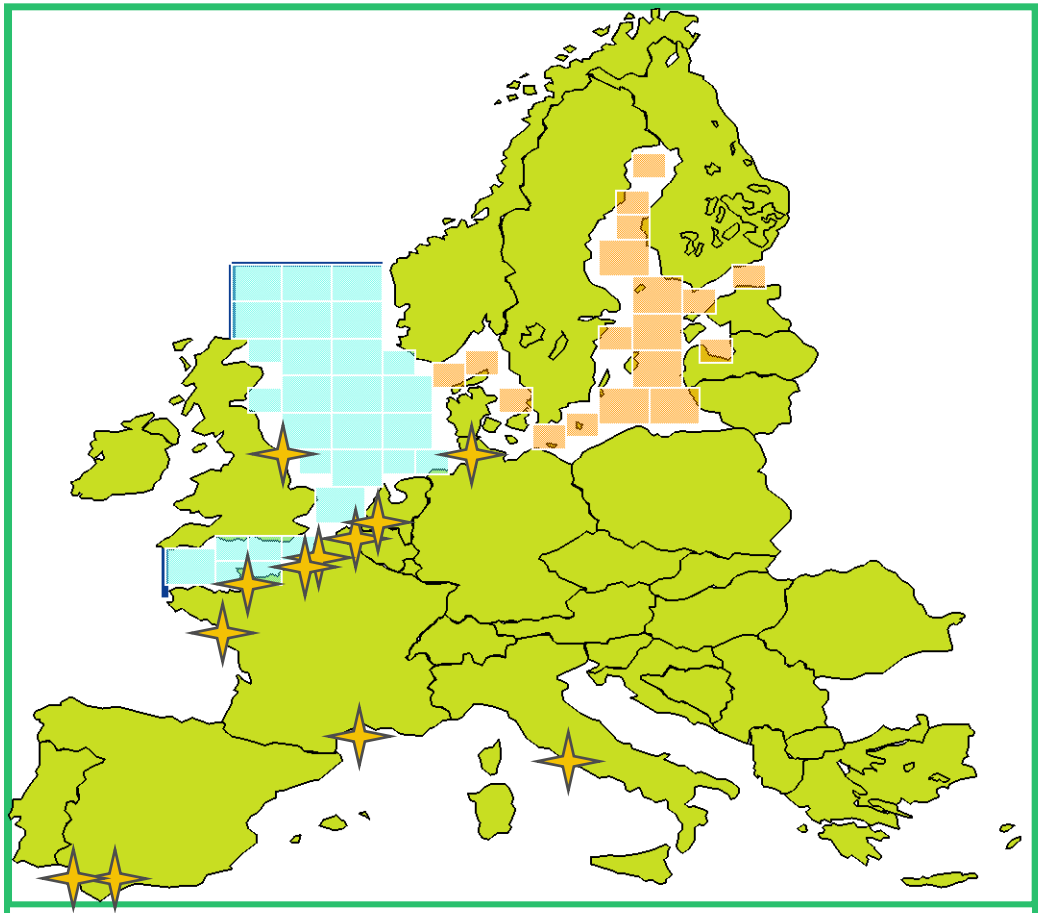
High viscosity and low sulphur fuel trends

- Why TOTAL ?
- SECA1 & 2
- Fuel oil arbitrages & trends
  - Arbitrages
  - Quality
  - Volumes
  - Fleet size
- Focus on low sulphur bunkers
- Focus on high viscosity bunkers
- The future : MARPOL Annexe VI

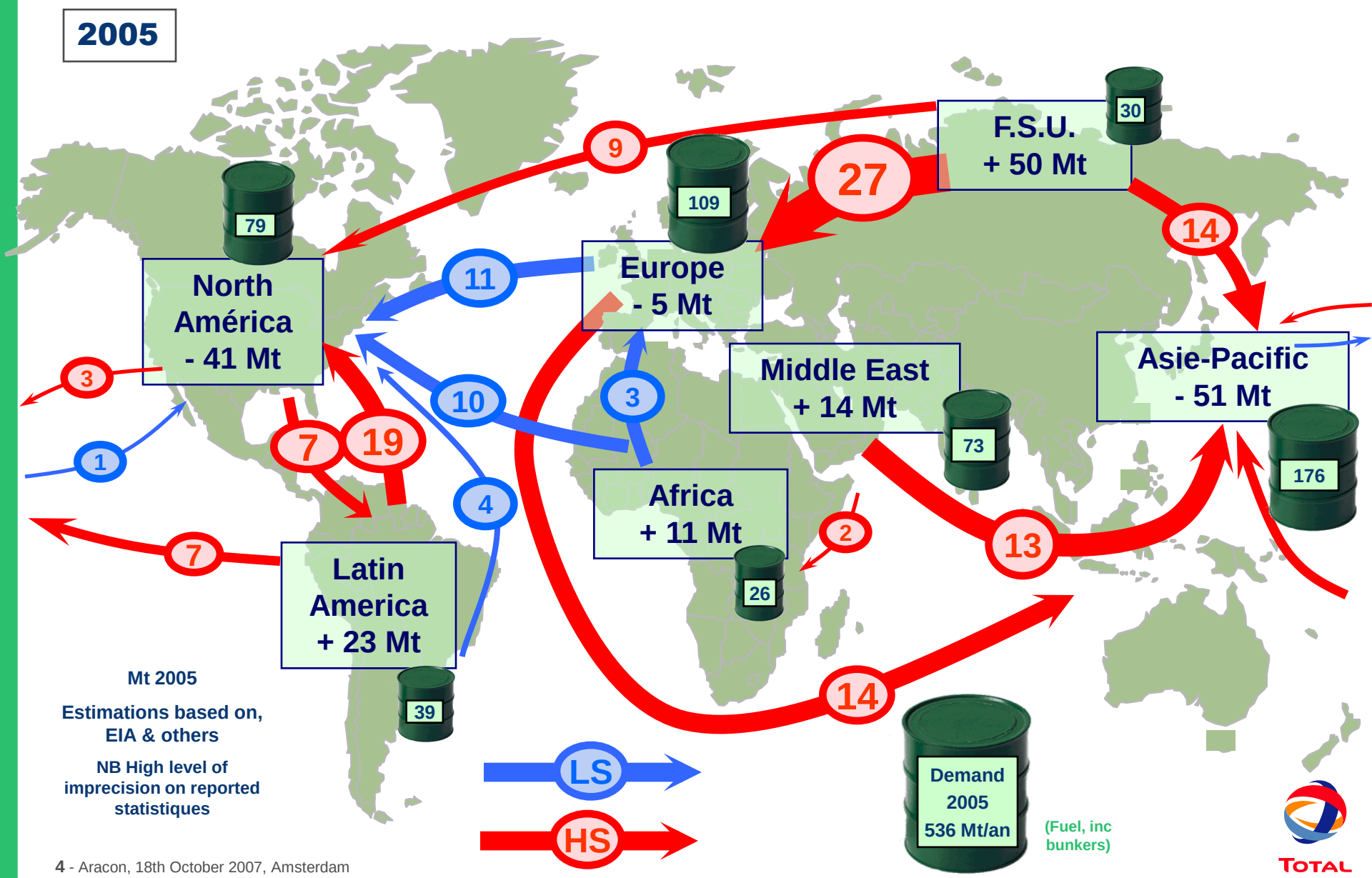
Why Total ?

- Largest refiner in Europe
- Seven refineries within the SECAs
- Significant share of European bunker market (including CEPSA)
- Strong Trading presence in ARA & cargo market



Total/CEPSA Refineries & the SECAs

Fuel oil : a world-wide commodity



Fuel oil flows & trends – even more volatility

- **Arbitrages are evolving……**
  - **Asia more and more dependent on Europe**
  - **Middle East becoming less long ?**
    - Dependence on Iran ?
    - India becoming long ?
  - **Brazil long : low sulphur exports to Europe & Singapore**
  - **Mediterranean short bunker quality ?**
  - **More arbitrages → more tanks → more blending**
- **Quality**
  - **Less straight run in European bunkers (M100 US demand)**
  - **Refiners upgrading → heavier fuel oil quality → more blending of bunkers**
  - **Tighter specification of ISO 8217**
    - Water, ash, sulphur levels reduced
    - Calcium, phosporous & zinc limits added
    - Annexes : Precision & Interpretation, Sodium & Vanadium, Acidity, Used lubricating oil
- **Volumes**
  - **How big is the international bunker market ? 200 - 220 million tons/pa ?**
  - **How big will it be ? 3-8% growth/pa ? 230 - 320 in 5 years ? Longer term : + 1-2% ?**
  - **WHERE ?**
    - **2007 : Singapore bunkers growth + 12% ; 2006/2005 + 11%**
    - **ARA : Rotterdam + 3% due to congestion ; Antwerp + 4% ; Zeebrugge + 100%**
- **Logistic impact**
  - **SECAs, more SECAs & mini-SECAs……?**
  - **More products = more tanks = more arbitrages = more risk = more volatility**
  - **High & low sulphur segregation**
  - **Bigger barges**
  - **More barges**

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The Fleet

- Containers
  - VLCSs + 50% on order for the next five years
- Tankers
  - VLCCs : + 40% on order
  - Single hull → VLOCs or FPSO ?
- Bulkers
  - Whow ! How long can it last ?
  - Often obscure ports
  - Impact single hull VLCCs after 2010 ?
- Cruise ships
  - Growing market
  - Need low sulphur in Europe, North & South
- Ferries
  - Need low sulphur in Europe : North & South
  - Prefer dedicated logistics/contracts
- General cargo
- Pleasure craft
- Military

Focus on low sulphur bunkers

- Bunker demand : our estimate in Europe + Baltic Sea = 40+ million tons/pa
  - Low sulphur, our estimate = 10 Mt ? (BP forecast = 14-18 Mt with full compliance)
- Compliance rate SECA 1: ? 30% ?
- Compliance rate for ferries and cruise ships in all European waters ? Unknown ?
- Compliance rate SECA 2 ? Better ? 20 → 30% of market will become low sulphur ?
  - So far, our experience is that demand is at our expected levels in the ports we serve
  - Low level of demand outside SECA (price ?)
- Logistics : small lot sizes ; low + high sulphur : logistic headaches → a niche market ?
- Supply : dependent on power plant demand ?
  - We do not anticipate a supply shortage with the current SECAs and 1.5% sulphur max.
- Quality : learning curve for blenders and barge operators
  - Repeatability and Reproducibility problems
    - IMO guidelines needed (ISO 4259:2006)

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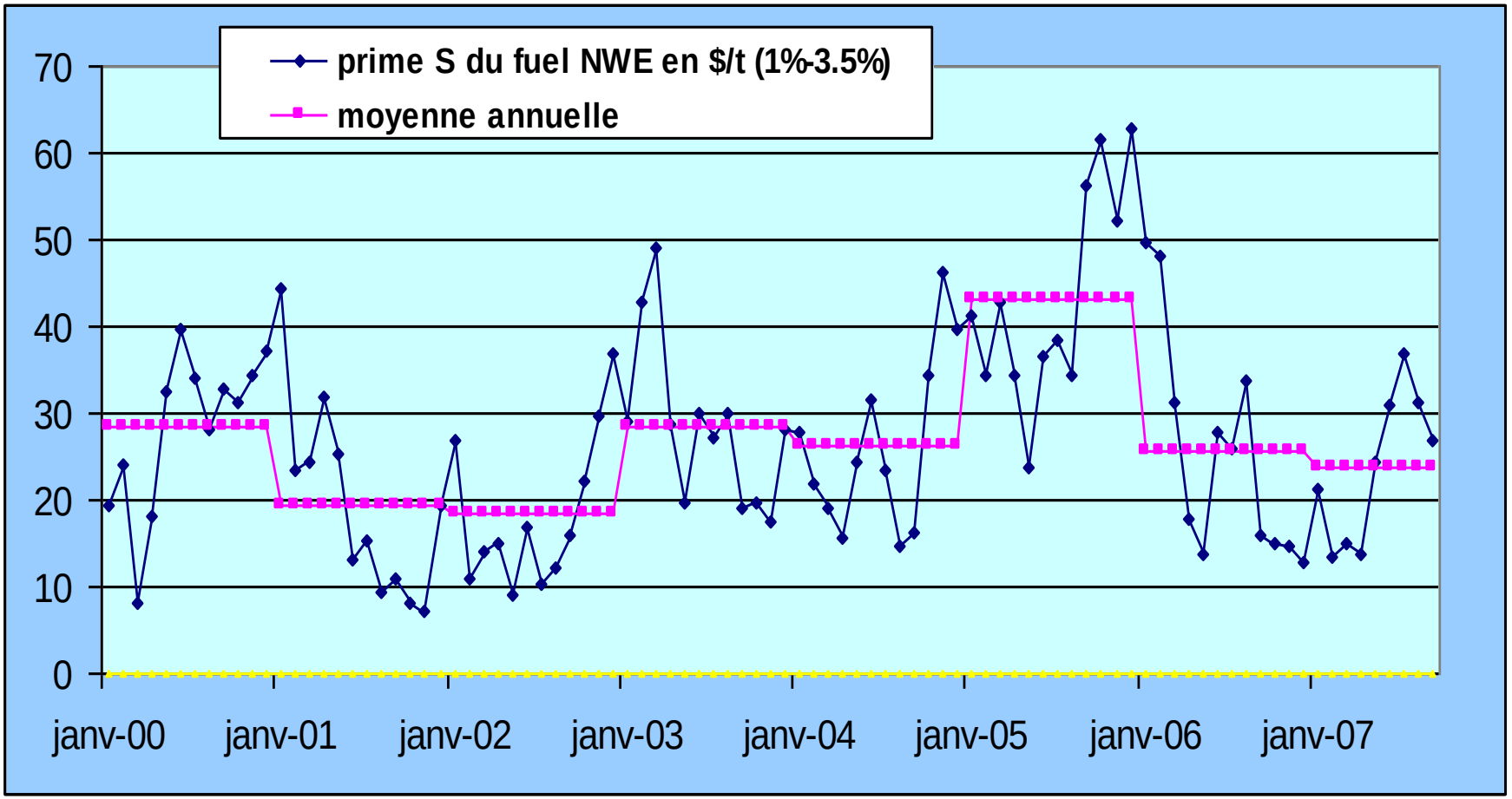
Pricing : Leading Indicator : Hi-Lo Spread
Cargo Differential = Alternative Market ?



Focus on high viscosity bunkers

Specification :

Classification ISO 8217 (2005)

Category ISO-F- /TOTAL Marine Fuels specifications			ISO RMA30	ISO RMA 30	ISO RMD 80	ISO RME 180	ISO RMF 180	ISO RMG 380	ISO RMH 380	ISO RMK 380	ISO RMH 700	ISO RMK 700	Test method reference
Caractéristique	Dim	Limit											
Density at 15°C	kg/m3	max	960,0	975,0	980,0	991,0		991,0		1010,0	991,0	1010,0	ISO 3675 or ISO 12185
Kinematic Viscosity at 50°C	mm²/s (a)	max	30		80	180		380			700		ISO 3104
Flash point	°C	min	60		60	60		60			60		ISO 2719
Pour point (b)													
winter	°C	max	0	24	30	30		30			30		ISO 3016
summer	°C	max	6	24	30	30		30			30		ISO 3016
Carbon residue	%(m/m)	max	10		14	15	20	18	22		22		ISO 10370
Ash	%(m/m)	max	0,10		0,10	0,10	0,15	0,15			0,15		ISO 6245
Water	%(V/V)	max	0,5		0,5	0,5		0,5			0,5		ISO 3733
Sulphur[c]	%(m/m)	max	3,5		4,0	4,5		4,5			4,5		ISO 8754 ou ISO 14596
Vanadium	mg/kg	max	150		350	200	500	300	600		600		ISO 14597 ou IP 501 ou IP 470
Aluminium plus silicon	mg/kg	max	80		80	80		80			80		ISO 10478 ou IP 501 ou IP 470
Total sediment, potential	%(m/m)	max	0,10		0,10	0,10		0,10			0,10		ISO 10307-2
Used lubricating oil (ULO)			**The fuel shall be free of ULO [d]**										
Calcium	mg/kg	max	30		30	30		30			30		ou IP 501 ou IP 470
Phosphore	mg/kg	max	15		15	15		15			15		ou IP 501 ou IP 470
Zinc	mg/kg	max	15		15	15		15			15		ou IP 501 ou IP 470

a) Annex C gives a brief viscosity/temperature table, for information purposesonly. 1 mm²/s = 1 cSt

b) Purchasers should ensure that this pour point is suitable for the equipment on board,especially if the vessel operates in both the northern and southern hemispheres.

c) A sulfur limit of 1,5 % (m/m) will apply in SOx emission control areas designated by the International Maritime Organization, when its relevant protocol comes into force. There may be local variations.

d) A fuel shall be considered to be free of ULO if one or more of the elements zinc, phosphorus and calcium are below or at the specified limits. All three elements shall exceed the same limits before a fuel shallbe deemed to contain ULO.

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Focus on high viscosity bunkers

- **Specification** :
  - ISO RMK 700 with density 1010 max instead of 0.991, typically <1000
  - Most buyers limit to 500 cst, but up to 700cst possible
  - These 'relaxed' specifications lead to more economic blending
  - DNV « relatively few major quality issues »
  - Demand limited by heating & centrifuge systems on board ?
  - OEMs recommend that all ships, independent of the application of the ship, have their secondary systems designed for 700 CSt at 50 c.
- **Volumes** :
  - Singapore 2007 12% ; New York 15% ; Los Angeles 20% ;le Havre 50% ; Fos 35%; ARA ?? ; Houston ??
  - Will grow faster than the market due to fleet changes : >5-10% ?
- **Fleet & engine constraints** :
  - VLCS – engines from 1995 build to 2006 Sultzer 12RTflex96 or Man BW 12k98RC
  - We have never sold high viscosity fuel to a tanker or a bulker : why not ?
    - Prudence, charter-party restrictions, shipowner vs. charterer?
- **Price** : Discount to 380cst between $2 - 8/mt depending on port
- **Availability** : New York, Houston, Los Angeles, ARA, Singapore, Hong Kong, le Havre, Fos……
- **Logistics** : need large barge (5-10,000mt)

  good pumping rate (1000 tons/hour)

  short delivery windows
- **Customers** : APM, CMA/CGM, Hanjin, Hyundai, MSC, Hapag Lloyd, Yang Ming,…

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The Future – MARPOL Annexe VI – the 6 Options

- Status quo : with perhaps more SECAs.
- Global sulphur cap & SECA <1.00% 2010 ? <0.50% 2015 ? Any fuel
- US : lower SOx & PMs emissions only possible with distillate fuel compulsory within 200 miles of shore in SECAs. Abatement technology would allow fuel oil.
- BIMCO : gradual lowering of global sulpur cap + distillate in SECAs with max 1.0% in 2011, 0.5% in 2015. Abatement technology allowable.
- Intertanko : All distillate 2012 with 1.0% global cap, 0.50% in 2015. No abatement technology available.
- As Intertanko but abatement technology available.

High viscosity and low sulphur fuel trends

- **What do we know, what don't we know ?**
  - Effective date of new Annexe VI application ?
  - What type of fuel & where ? (distillate or fuel oil)
  - Products needed ? (low, high sulphur, viscosity?)
  - Compliance & policing levels ?
  - Logistics needed ?
  - Heated or unheated storage & barges ?
  - Scrubbers, with guidelines ?
  - Emissions trading & tax incentives ?
- **What do we need ?**

CERTAINTY

- We all know that change is coming and is needed
- Not just refiners, but trading, logistics, bunkering and shipping industries all need firm dates and rules
- We can then plan the necessary investments and changes to our businesses within a realistic timetable

High viscosity and low sulphur fuel trends - the Future ?

- **The next three years ?**
  - **increasing 500cst bunker volume >5-10% more than market growth in key container ports**
  - **stable to increasing low sulphur volumes**
    - dependent on policing
    - plus the speed and extent of MARPOL changes

- **In ten years time ?**
  - **Your guess is as good as mine !!!**

THANK YOU !

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MAERSK LINE
ELLY MAERSK