



American Association Port Authorities - Cruise Seminar

Environmental Challenges

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The Leader in Maritime
Testing & Surveys

World leading fuel management partner

1st

Veritas Petroleum Services
pioneered the fuel testing industry in
1981

2.0

More than 2 million fuel samples has
so far been analysed by Veritas
Petroleum services

55%

55% of all fuel samples in the world
are tested by Veritas Petroleum
Services

Global Presence with Unmatched Service

Bunker Quantity Surveys in 200 ports

No.1

Veritas Petroleum Services have the most extensive fuel quality database in the world

4

Veritas Petroleum Services Operates 4 world class labs positioned around the world to offer customers rapid results



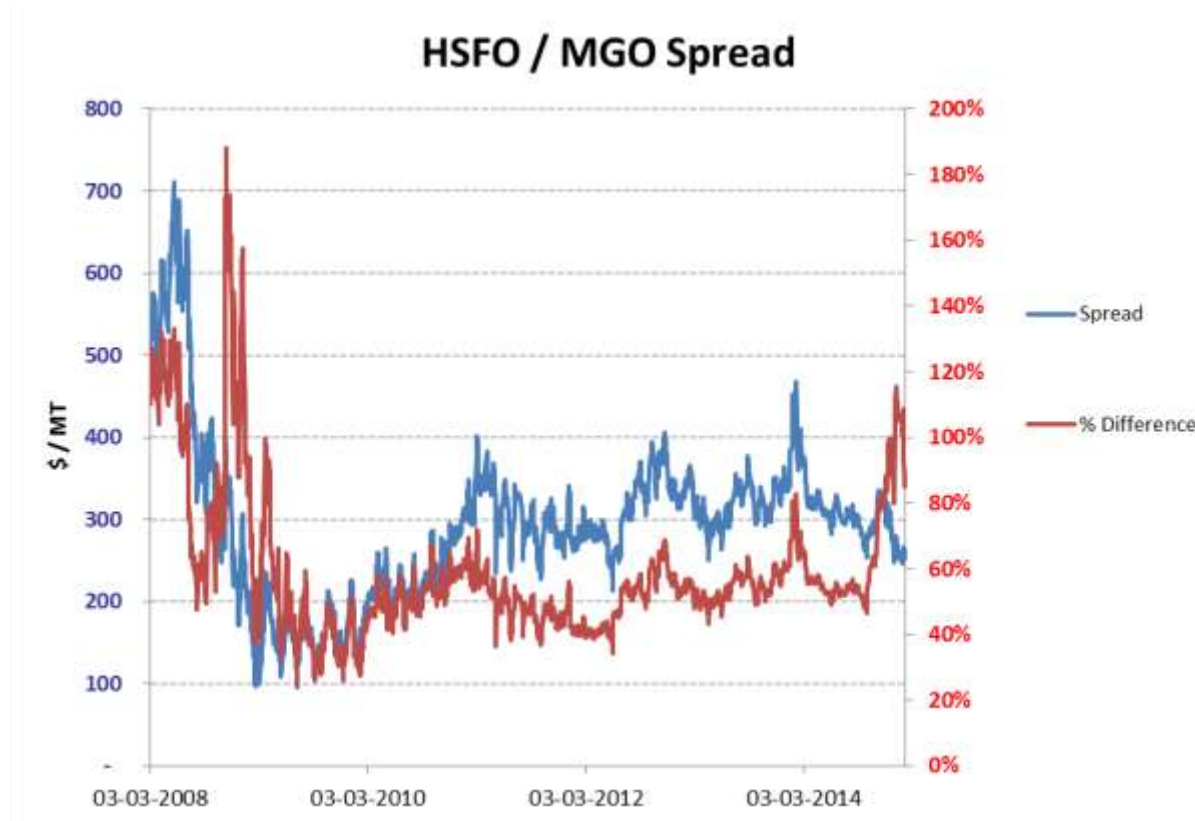
Compliance options

“Simple” Solution:

- Switch to low sulfur Marine Gasoil
 - High cost (spread vs. absolute cost?)
 - Technical concerns
 - Availability concurs (Marine spec)
- Is not as “simple” as it seems...



General concerns with Marine Gasoil (MGO)



- Financial pressure has been reduced, but opportunity cost remains high
- Helps some ship owners that were concerned with “survival”, but there is still a strong financial incentive to find alternatives



General concerns with Marine Gasoil (MGO)

Switching to MGO is less complicated than other alternatives; however:

- Ship specific change over routines
 - Regulatory compliance
- Stability / compatibility issues
 - Blending & limited hydro-treating
- Cold flow performance
 - Biofuel content
- Lubricity
 - Ultra low sulfur
- Low flash point
 - Lower standard for automotive diesel



General concerns with Marine Gasoil (MGO)



DNV Petroleum Services

Sales & Marketing Laboratory Technical BQS QHSE Data Enquiry Toolbox Brand Central Miscellaneous

Menu Items marked with an * have restricted access.
Problems or suggestions, please send an email to [DNVPS Singapore](#)

Intranet Additions and Updates

New	06/02	Bunker Alert No. 09/2015 - Low Flash Point distillates	in Bergen, Norway
New	03/02	Bunker Alert No. 08/2015 - Low Flash Point distillates	in Philadelphia and surrounding ports, USA
New	30/01	Bunker Alert No. 07/2015 - Low Flash Point distillates	in Miami and surrounding ports, USA
New	23/01	Bunker Alert No. 06/2015 - Low Flash Point distillates	in Istanbul, Turkey
New	23/01	Bunker Alert No. 05/2015 - Low Flash Point distillates	in Zeebrugge, Belgium
New	21/01	Bunker Alert No. 04/2015 - Low flash point distillates	in Rotterdam, the Netherlands
New	21/01	Circular: "US EPA : Penalty Policy for Violations of North American ECA"	
New	14/01	Bunker Alert No. 03/2015 - Low Flash Point distillates	in New York, USA
New	09/01	Bunker Alert No. 02/2015 - High abrasives fuels	in Liverpool, UK
New	09/01	Bunker Alert No. 01/2015 - Low viscosity distillates in	Norfolk, USA
New	23/12	Bunker Alert No. 65/2014 - High abrasives fuels	in Singapore

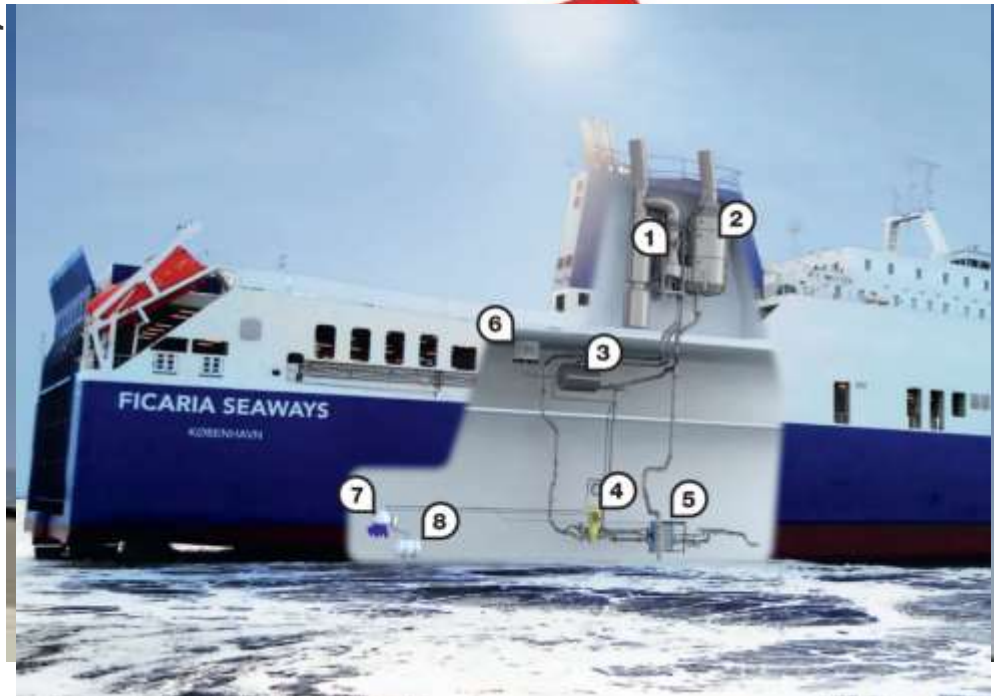
- In 2014 VPS issued an average of 5 “Bunker Alerts” per month (mostly HFO related)
- 2015’s current rate is 9 “Bunker Alerts” per month (mostly MGO related)
- Flash point is a mandatory parameter and safety issue

Compliance options

Exhaust Treatment:

- Long lead-time to have operational
- High capital cost
- Physical limitations
 - Space for towers
 - Space for tankage
 - Weight & stability
- Regulatory uncertainty
- Cruise sector represents a disproportionate share of the market

Exhaust
Treatment

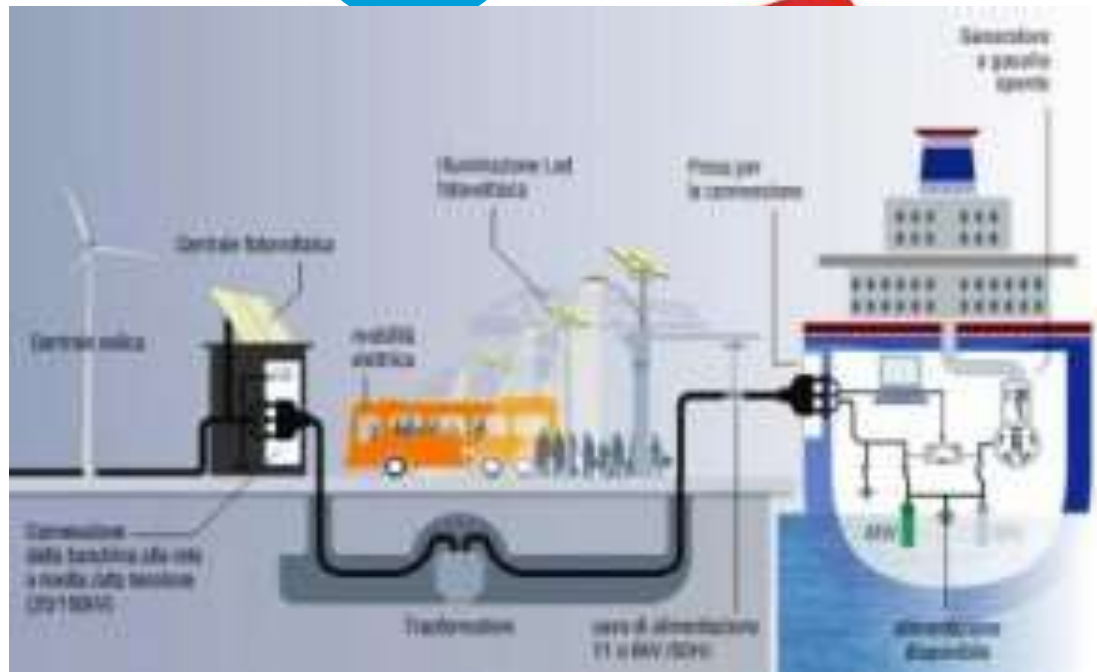


Compliance options

Other Energy Options:

- Shore Power / Cold Ironing
 - Requires close cooperation with ports
 - Significant commitment from all parties (port, vessel owner, & power supplier)
- Partial solution

Other
energy
options



Compliance options

Liquefied Natural Gas (LNG):

- Significant capital investment
 - No “global” price for LNG
 - Requires long term contracts
 - Declining economics
- Significant space requirement (~4x)
- Limited availability
- Issues with Nox compliance



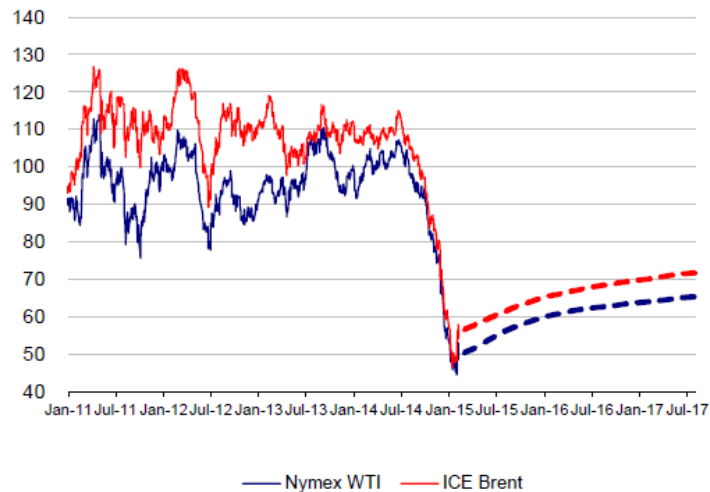
Compliance options

Liquefied Natural Gas:

- Challenge to deliver at economic price compared to MGO
- More challenging if competing with HFO + scrubber
- Current Price trends have not helped

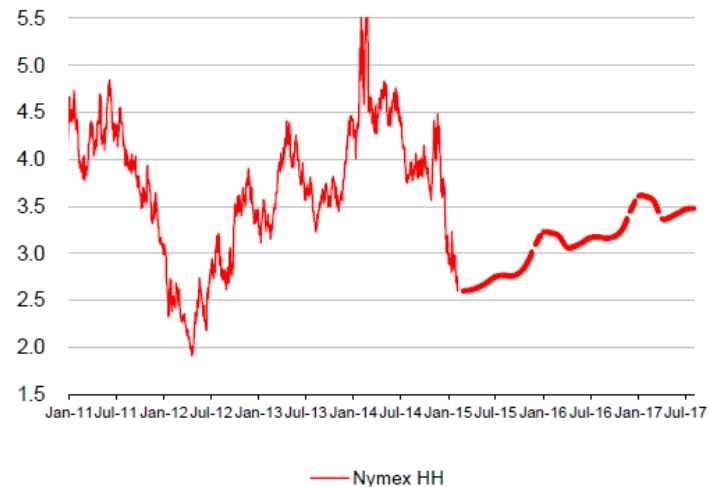
Historical Prices and Forward Curves

Oil (\$/bbl)



Source: Bloomberg, Morgan Stanley Commodities Sales and Trading

Natural Gas (\$/Mmbtu)



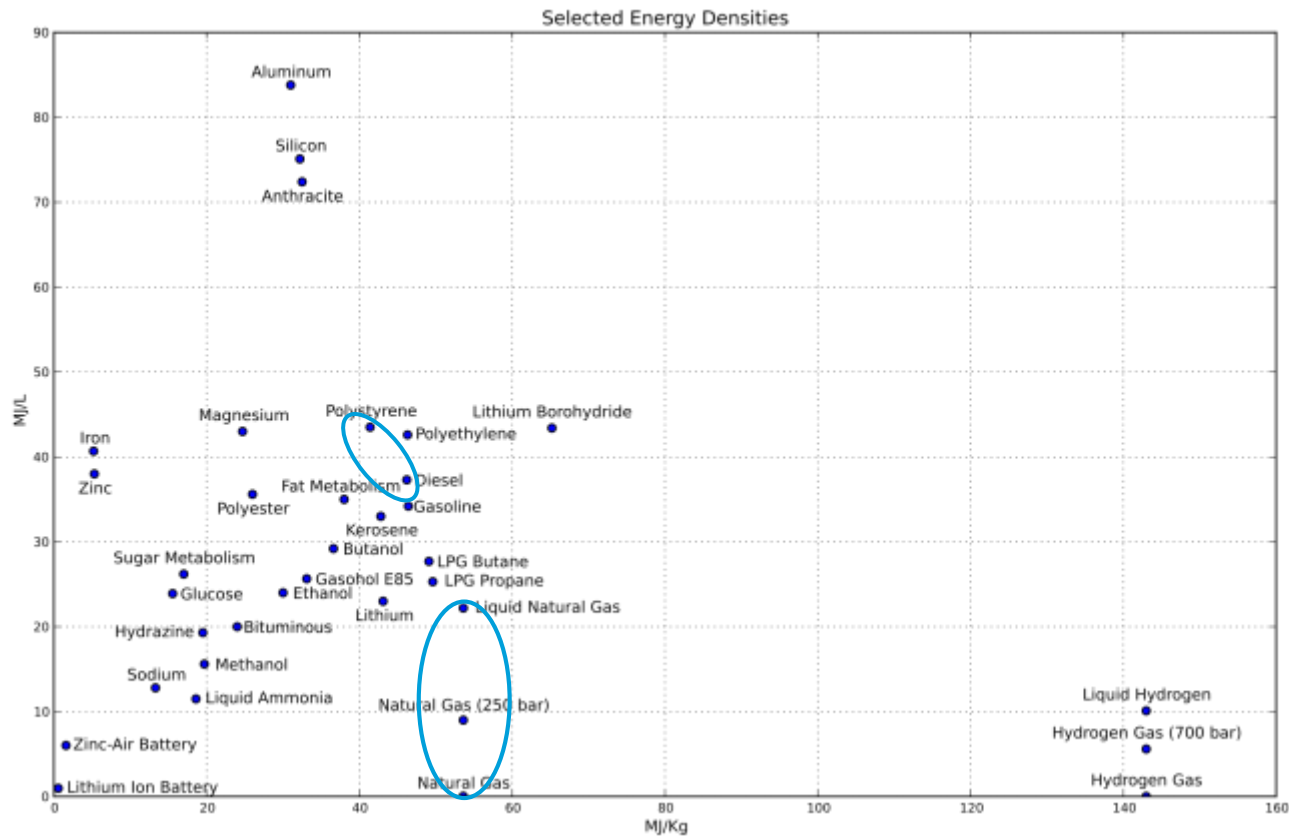
Source: Bloomberg, Morgan Stanley Commodities Sales and Trading



Challenge with LNG's

2 main challenges with natural gas in general

- Very low energy density
- Difficult to store and transport compared to other fuel types

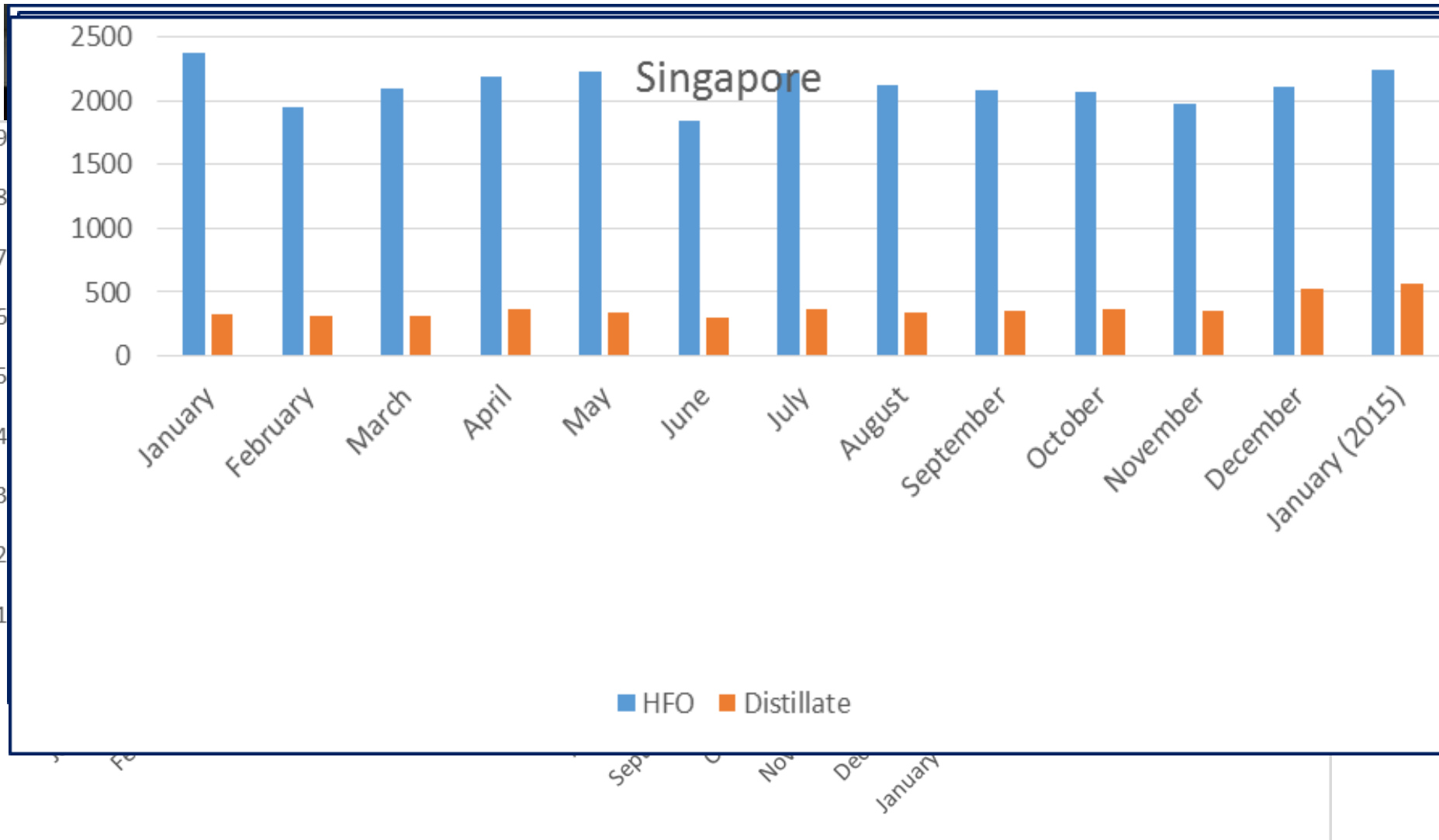


So, What are they doing?

- Major cruise lines are heavily investing in exhaust gas scrubbers
 - Still using HFO
 - Rely on exemptions to carry through the technology development phase
- Seeing some small interest in “hybrid” diesel products
- Majority of ships using MGO
- How can we tell:

55% of all ships bunker fuel come to us for testing

VPS Fuel Quality Testing



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