

AXELROD



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ULSFO Prognosis

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Platts Bunker and Residual Fuel Oil Conference

25-26 June 2015

Houston



Introduction

1. ECAs
2. LSFO
3. MGO
4. ULSFO

ECA Rules

- Zones (SECAs/ECAs)
 - Baltic (effective May 2006)
 - North Sea/English Channel (effective Nov 2007)
 - North America (effective August 2012)
 - US Caribbean (effective January 2014)
- Sulfur Emissions (%S max)
 - 1.5%S (effective May 2006)
 - 1.0%S (effective July 2010)
 - 0.1%S (effective January 2015)

ECA 1%S Fuel Oil

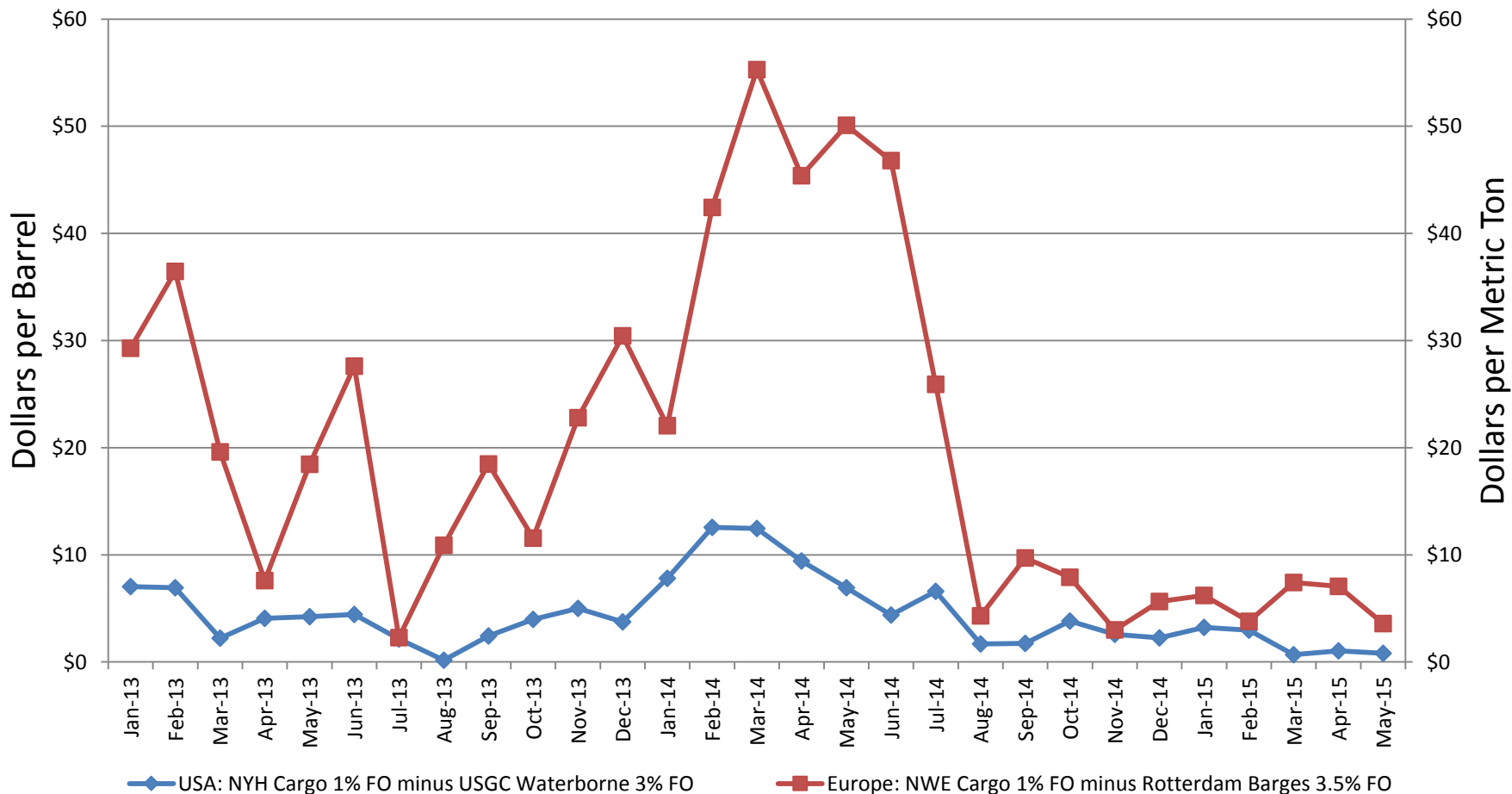
- Northwest Europe
 - 9.5 - 10.5 million mt/year
- North America
 - 2.2 - 3.0 million mt/year

ECA 1%S Fuel Oil

- How to make 1%S fuel oil disappear
 - Refinery closures/upgrading
 - IPP demand
 - Higher sulfur components to HSFO pool
 - Compressed HI-LOs

ECA 1%S Fuel Oil

USA and Northwest Europe, Fuel Oil Hi-LOs



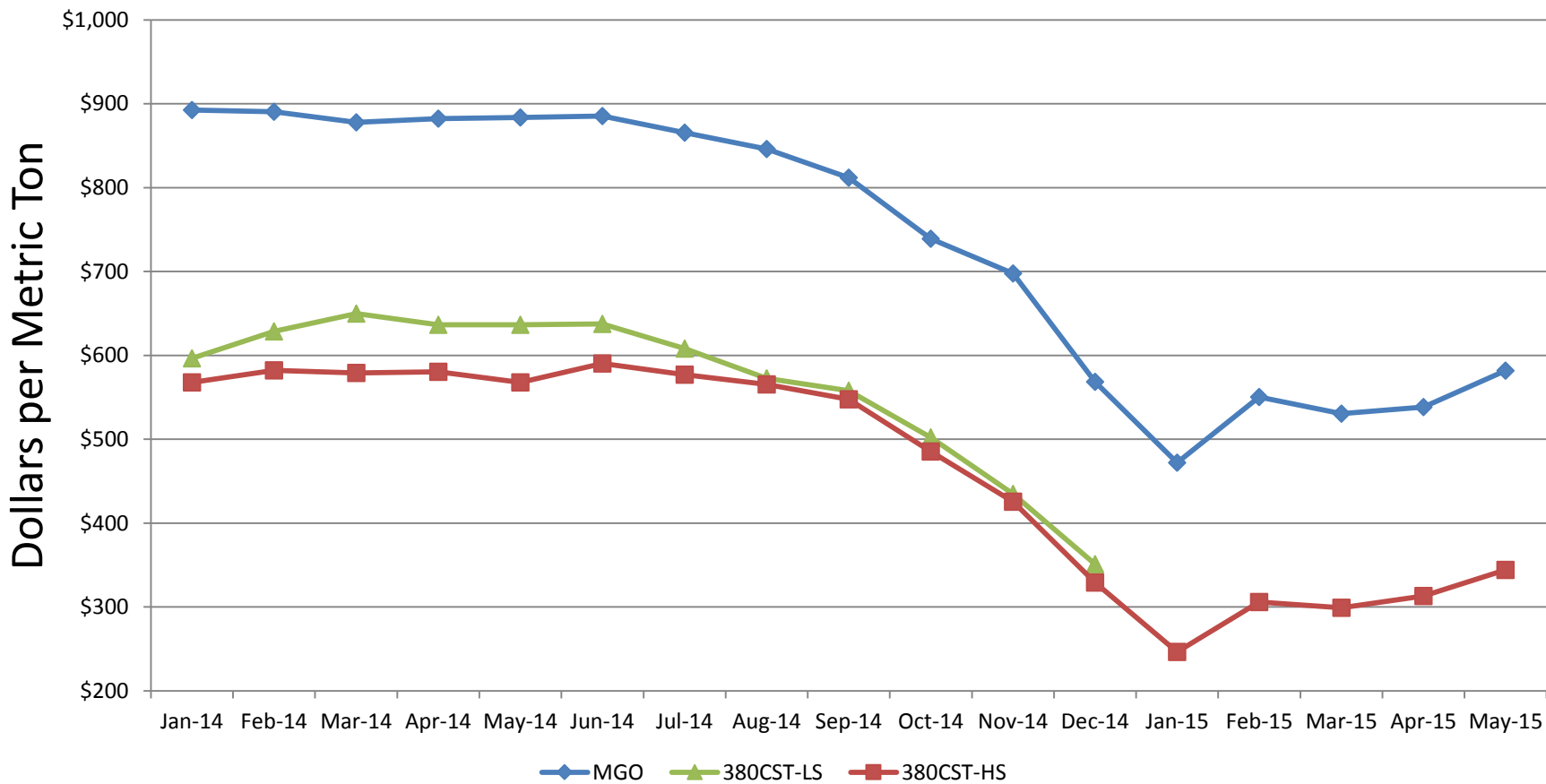
ECA 0.1%S Bunker Fuel

- Alternative ways of meeting 0.1%S cap:
 - Scrubbing
 - LNG
 - MGO
 - ULSFO

MGO

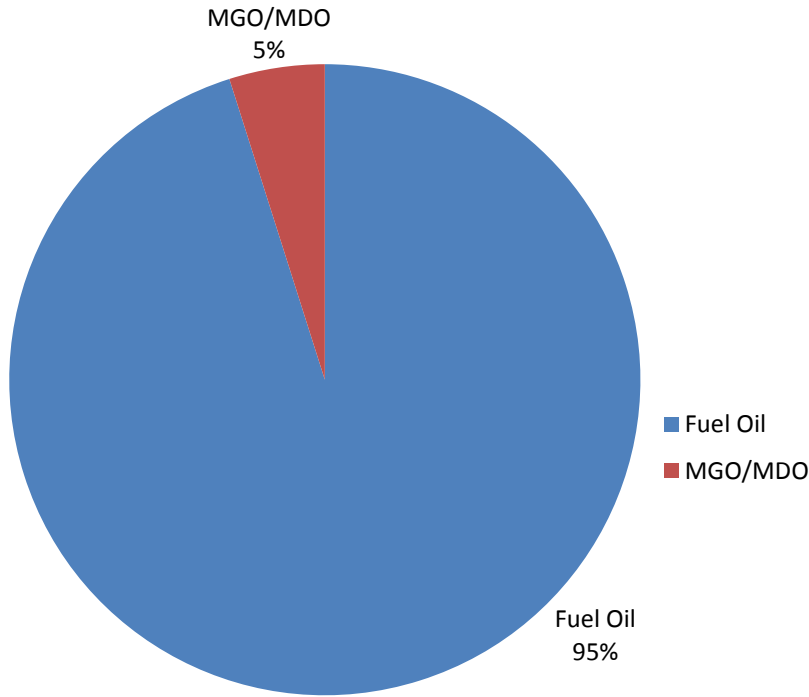
- Technical fuel issues
 - Lubricity (a minus)
 - Solvents (a plus)
 - Heat not necessary
 - Chill to increase viscosity
- Refiners happy to accommodate
- MGO looks a lot less expensive post-price collapse

Rotterdam, Bunker Fuel Prices



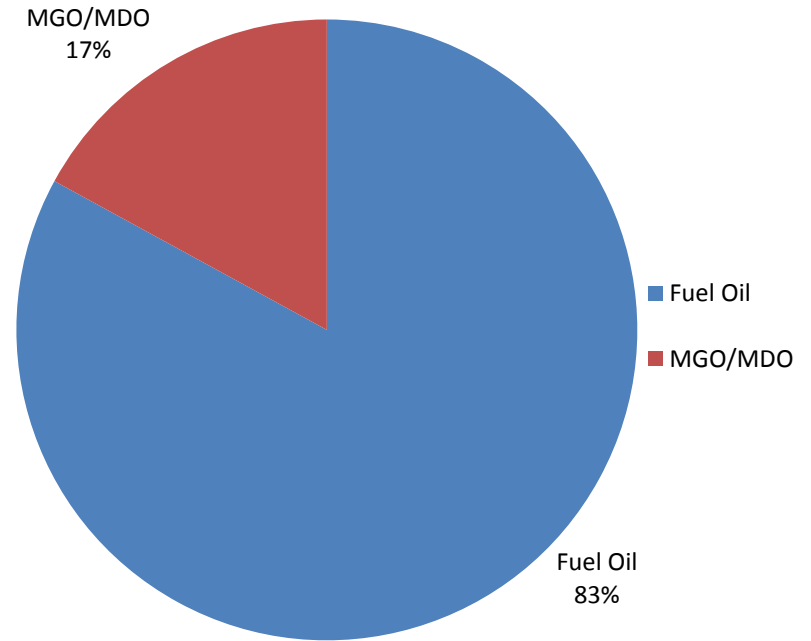
Rotterdam, Bunker Fuel Sales

Q1 2014



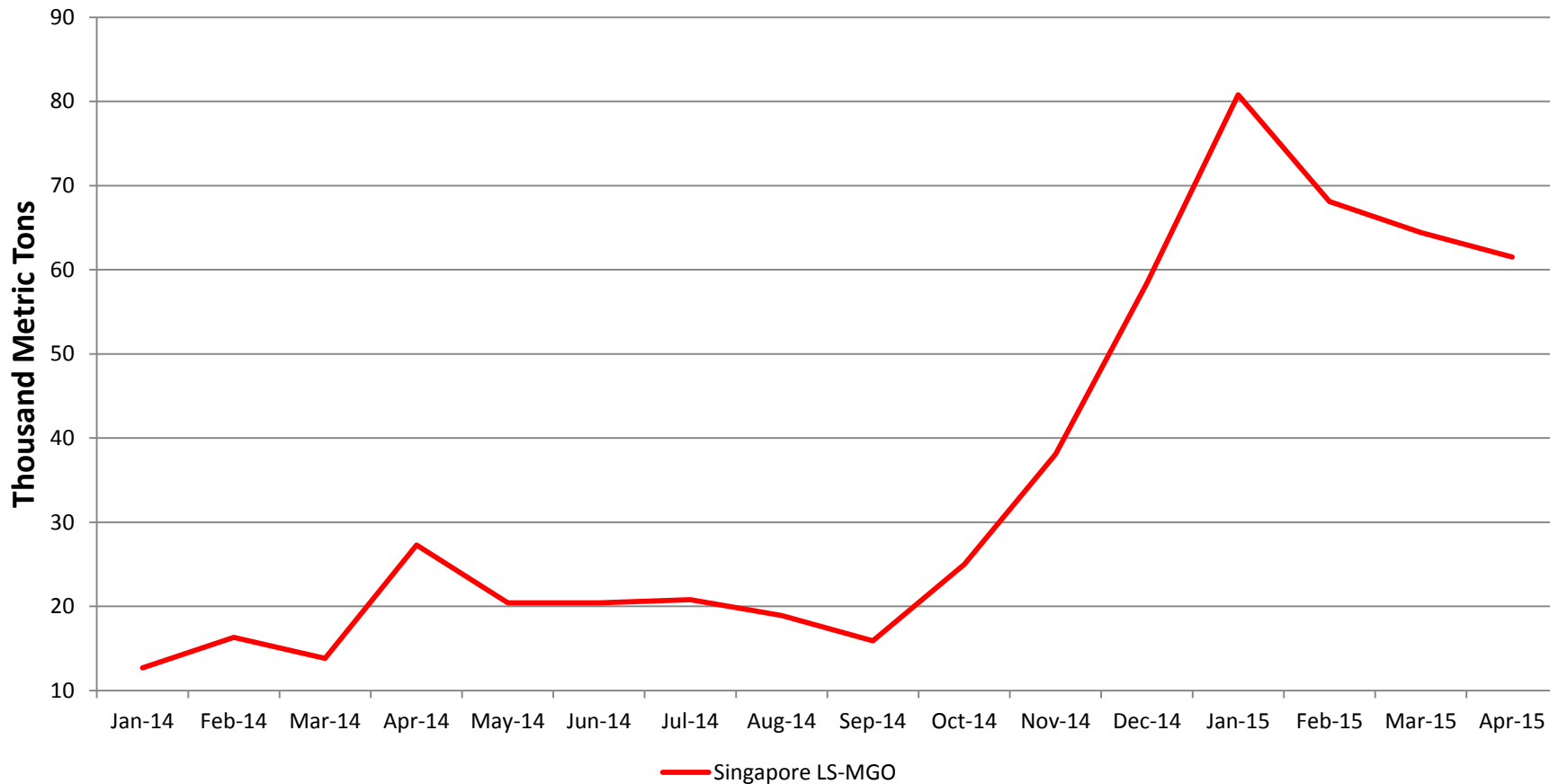
Total Bunker Fuel: 2.78 Million MT

Q1 2015



Total Bunker Fuel: 2.47 Million MT

Singapore, LS MGO Sales



ULSFO | | Shipowners

- Handling/specification issues
 - Compatibility
 - Stability
 - Cold Properties
 - ULSFO vs MGO
 - Higher viscosity
 - Higher density
 - Higher flash
 - Higher pour point

ULSFO || Shipowners

- Emerging Paradigm
 - Sailing mainly (or entirely) in ECA
 - Single source of supply
 - Single type of fuel
 - Term supply

ULSFO | | Shipowners

- Types of ships
 - Ferries
 - Car carriers
 - Cruise
 - Bulk carriers
 - Containers



ULSFO || NWE Suppliers

ARA	Scandinavia	Baltics
Exxon	Statoil	Lukoil
Shell	Cargill	
BP		
Total		
SK Energy		
Phoenix		

ULSFO || US Suppliers

- Chemoil (NYH and Savannah)
- Shell (NYH, New Orleans) **Montreal?**
- Atlantic Gulf (Mobile)
- Peninsula (River)

ULSFO | Specifications

Northwest Europe, ULSFO Specifications, Guarantees

	ExxonMobil	Shell	Lukoil
Sulfur Content, max %	< 0.1	<0.1	0.095
Viscosity at 50°C (cSt)	25-45	10-60	65
Density at 15° kg/m3	895 - 915	790-910	910
Pour Point °C	9 - 15	18	-
Flash Point °C	> 70	> 60	60
Total Acid Number (Mg KOH/g)	< 0.1	<0.5	25
CCAI	795 - 810	800	860
Al + Si (ppm)		10-20	

ULSFO | | Specification



United States, ULSFO, Typicals			
	USAC	US Gulf Coast	
	Chemoil	Shell	Atlantic Gulf Bunkering
Sulfur Content, max %	< 0.1	<0.1	< 0.100
Viscosity at 50°C (cSt)	26.3	10-60	15 - 25
Density at 15° C (kg/m3)	896	790-910	-
Pour Point °C	-6	18	< - 5
Flash Point °C	> 65	> 60	80 +
Total Acid Number (Mg KOH/g)	2.35	<0.5	< 0.02
CCAI	795	800	-
Calcium (ppm)	175	--	< 5

ULSFO | | Production and Blending

- Within refinery (VGO)
 - VGO
 - Hydrocrackate
- Blends
 - VLSFO
 - VGO
 - Distillate streams

ULSFO || Pricing

- Suppliers: Cost of maintaining
 - Segregated tanks, barges, lines
- Shipowners: Less expensive than MGO
 - Minimal performance risks
- Discounts to MGO
 - USA: \$30-50 per MT
 - NWE: \$50-75 per MT

ULSFO || Sales

- NWE: Less than 150kt month
- USAC: Less than 25kt month
- USGC: Less than 20kt month

ULSFO || Prospects

- Indicators
 - Blue ocean containers
 - Rising comfort on technical/specification issues
- Price
 - Possibility of steeper discounts
 - Rising flat prices

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