



INTERTANKO

USE OF MDO BY SHIPS THE RATIONAL BEHIND THE PROPOSAL

**Future Marine Fuels
– Challenges to the Marine Industry
CIMAC CIRCLE Norway 2007**

dragos.rauta@intertanko.com



INTERTANKO

INTERTANKO

MISSION

Provide leadership to the Tanker Industry in serving the world with the safe, environmentally sound and efficient seaborne transportation of oil, gas and chemical products.

VISION FOR THE TANKER INDUSTRY

A responsible, sustainable and respected Tanker Industry, committed to continuous improvement and constructively influencing its future.

INTERTANKO AND ITS MEMBERS' GOALS

.....

INTERTANKO MEMBERS will:

- **Lead the continuous improvement of the Tanker Industry's performance in striving to achieve the goals of:**
 - **Zero fatalities**
 - **Zero pollution**
 - **Zero detentions**



INTERTANKO

IMO & UNILATERAL LEGISLATION ON LOW SULPHUR MARINE FUELS

DATE	SHIP TYPE	WHERE	max. % S	REG.
19.05.2005	All	Everywhere	4.5	IMO
19.05.2006	All	Baltic Sea	1.5	IMO & EU
11.08.2006	All	All EU Ports MGO (DMA and DMX) MDO (DMB and DMC)	0.2 1.5	EU
11.08.2006	Passenger ships	EU	1.5	EU
1.01.2007	All aux. & diesel-electric main engines on all ships	24 miles off California shore MGO (DMA grade) MDO (DMB grade)	- 0.5	CARB
11.08.2007	All	North Sea & English Channel	1.5	EU
22.11.2007	All	North Sea & English Channel	1.5	IMO
1.01.2010	All	All EU ports	0.1	EU
1.01.2010	Inland waterway ships	All EU inland waterways	0.1	EU
1.01.2010	All aux. & diesel-electric main engines on all ships	24 miles off California shore MGO (DMA grade)	0.1	CARB
1.01.2012	16 Greek ferries	Greek ports	0.1	EU



Sulphur limits in modes of transportations

Table 2 Sulphur content of fuels in different applications and sectors

Sector		Sulphur content in ppm	
Marine bunker fuel oil limit	—————→	45 000	4.50%
Marine bunker fuel oil, typical values		29 900	
Marine gas oil limit		15 000	
Marine: EU limit for use in sensitive areas and in passenger ships operating on regular services to or from EU ports, 2006	—————→	15 000	1.50%
Marine gas oil, typical values		7 300	
Marine: proposed EU Parliament limit for all EU waters		5 000	
Aviation jet fuel limit		3 000	
Aviation jet fuel, typical value		400–600	
Diesel used by trains and machinery, current EU limit		2 000	
Diesel used by trains and machinery, EU limit 2008	—————→	1 000	0.1%
Automotive diesel EU limit before 2005		350	
Automotive diesel EU limit, 2005		50	
Automotive diesel EU limit, 2009	—————→	10	0.001%

Sources: Maximum permitted sulphur content for marine fuels are from (IMO, 1997) and Directive 2005/33/EC (EC, 2005h). Typical values for marine fuels are from (EMEP/Corinair, 1996). Maritime sulphur limits are from Directive 2005/33/EC (EC, 2005h). Aviation jet fuel limit and typical value are from 'Flight path to excellence' (IATA, 2001). Current and future automotive limits are from EU Directive 99/32/EC (EC, 2005h) and Directive 98/70/EC (EC, 1998).

Source: European Environmental Agency



INTERTANKO OBSERVATIONS

- **Type/quality of fuel is the KEY to control all air emissions from ships**
- **Rules or suggestions for revisions do not address the type & the quality of fuels**
- **Need for predictable regulations**
- **Need for simple and efficient regulations**
- **Ship owners are targeted by IMO regulations**
- **Ship owners need to take initiatives**
- **A good place to start from: the *cause* of emissions from ships' engines**



INTERTANKO SUGGESTION

- 1. Include the Fuel Oil specification in Annex VI**
- 2. Simplify monitoring of compliance**
- 3. Switch to MDO with a 2-tiered global S cap program:**
 - a. Tier I - 1.00% S content**
 - b. Tier II - for new engines, 0.50% S content**
- 4. Removal of SECA provisions**



INTERTANKO SUGGESTION

- *INTERTANKO believes use of cleaner fuels is inevitable*
- *INTERTANKO did **NOT** suggest to remove provisions for use of technologies*
- *INTERTANKO suggests that use of MDO or better (MGO, LNG, etc) would stimulate innovation*
- *Use of low S MDO (or better) will facilitate innovation for sophisticated and efficient in-engine clean exhaust gas systems*



REASONS FOR SWITCH TO MDO

- MDO applies to ALL existing engines
- With no other measure, immediate significant reductions on SO_x, PM emissions and measurable reduction of NO_x emissions
- Facilitates further NO_x reductions by in-engine modifications for IMO's Tier II & III
- MDO provides a much better platform for reducing air pollution from ships



WHAT'S IN IT FOR SHIP OPERATORS

- **Engines designed for use of low S MDO will tolerate further emission reductions**
- **Further emission reduction a function of:**
 - **fuel quality**
 - **sophisticated in-engine exhaust cleaning systems**
- **Fuel specification = Ships would not need to take responsibility of compliance of fuels they order as per Annex VI**



WHAT'S IN IT FOR SHIP OPERATORS

- **Solid platform of requirements**
- **Long term and significant reduction of air emissions from ships**
- **Long term and a predictable regulatory regime**
- **Prevents fragmented regulations**
- **A global standard for at sea, coastal and at berth operations (no SECAs)**



MDO - ADDITIONAL BENEFITS

- **ENVIRONMENTAL:**
 - Lower fuel consumption from ALL ships
 - Reduces CO₂ emissions from ALL ships
 - No heating and pre-treatment of bunkers = further reduction of CO₂ emissions from ALL ships
 - Eliminates fuel generated waste = further reduction of CO₂ emissions from ALL ships
 - No heavy metals and PAH in MDO – no need to clean up and dispose hazardous PMs
 - Use of in-engine solutions for further exhaust gas cleaning = no further additional waste & no need of further waste disposal
 - Potential bunker spills significantly less harmful



MDO - ADDITIONAL BENEFITS

- **SAFETY:**
 - **Less incidents with engine breakdowns caused by poorer quality fuels**
 - **No need of complex fuel change-over operations**
 - **No risk of incompatibility of blended fuels**
 - **Safer working environment for crews**
 - **Ships used to change to MDO in harbour/confined waters for one reason: SAFETY**



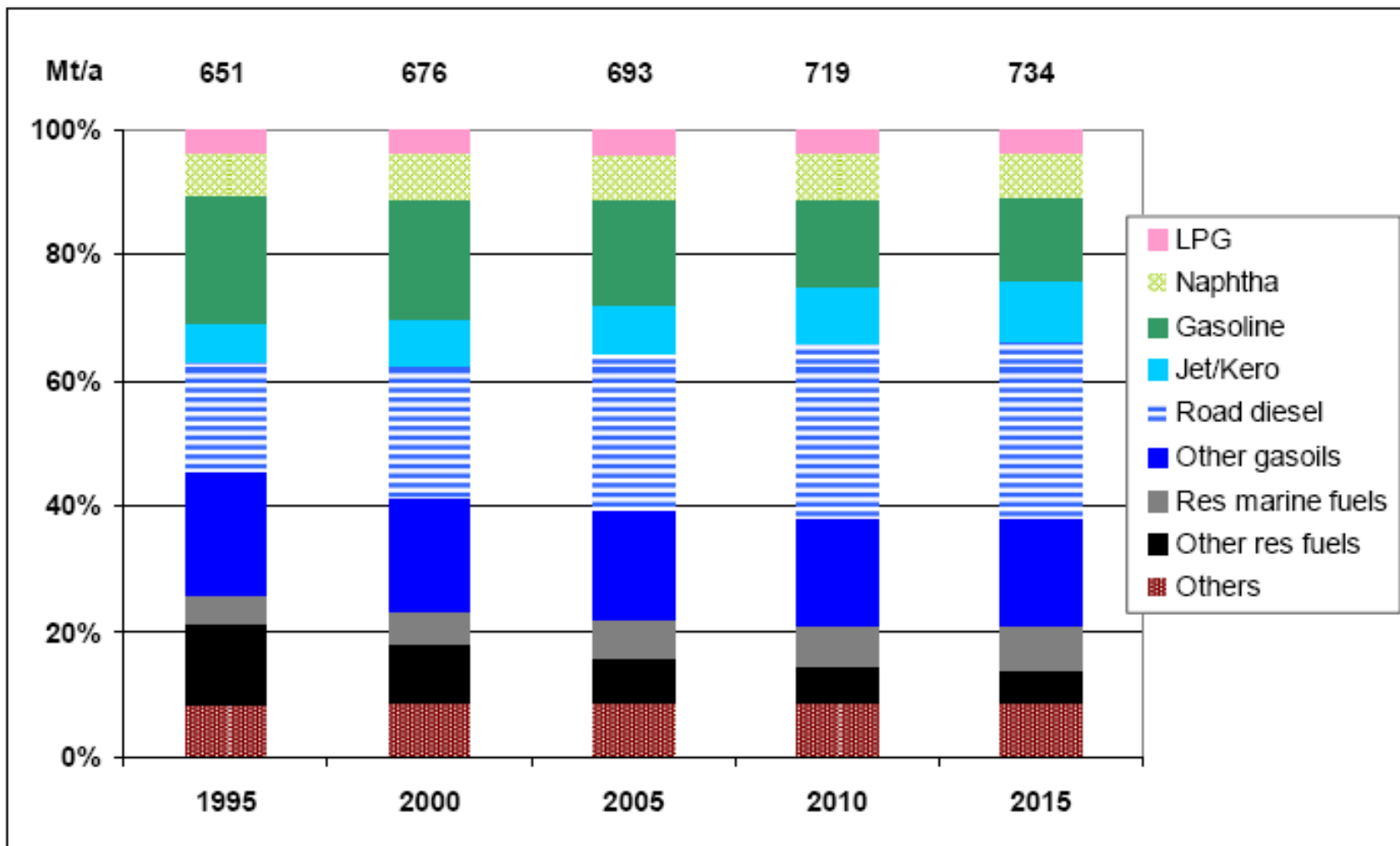
CO₂ EMISSIONS

- Emissions from refineries - various data presented:
15 mt to 53 mt
- CONCAWE – CO₂ t/t product = 0.212
- 150mt – 200mt MDO give **32 mt – 42 mt CO₂**
- CO₂ reductions from ships using MDO:
 - Reduction from combustion **30 mt – 35 mt**
 - Reduction from less sludge **5 mt**
 - Reduction from less heating and onboard treatment
- NO negative impact on CO₂ from use of MDO



INTERTANKO

HISTORICAL AND FORECAST PRODUCT DEMAND (EU-25 + 2)



(Source: Wood Mackenzie)

• "Whitening of demand barrel – sharp reduction of the inland residual fuels being only marginally compensated by a modest increase in marine fuels"

(CONCAWE report 1/07)



MDO AVAILABILITY

- THE PROBLEM IS NOT SUPPLY OF MDO
- "Marine Fuel Oils are the last major outlet for residual fuels although this may in time be affected by legislation to reduce the sulphur content in such fuels" (CONCAWE report 1/07)



MDO AVAILABILITY

- **2011 - New refinery capacities (660 mt/year*) sufficient to provide MDO**
- **1973 – 2005: Residual fuel supply decrease by:**
 - **61% in Asia**
 - **63% in Europe**
 - **65% in USA**
- **MDO for ships: further reduction of 3% to 5%**

** Petroleum Economist; IEA; Wood Mackenzie*



COSTS IMPACT

- **USD 200/t premium for MDO**
- **Total price USD 40 bill**
- **Tankers use 30% of fuels = USD 12 bill**
- **Tankers transport over 3 bill tons of oil and oil products/year**
- **Increased cost = USD 4/t or 0.4 cents/litre**
- **or**
 - **0.3% of the retail price of gasoline in Europe**
 - **0.6% of the retail price of gasoline in US**



COSTS IMPACT

- **1999 – 2005 HFO average price up 300%**
- **No recession for shipping**
- **Some segments did better than others but all did quite well**
- **2002 -2007 – historical # of new buildings**
- **What would be the emission limitations in 10 or 20 years?**
- **Should we progress in small steps only?**
- **At what cost?**
- **Equivalent costly solution to any other alternatives**



INTERTANKO

USE OF MDO - CONCLUSIONS

www.intertanko.com



INTERTANKO

Anti-Trust/Competition Law Compliance Statement

INTERTANKO's policy is to be firmly committed to maintaining a fair and competitive environment in the world tanker trade, and to adhering to all applicable laws which regulate INTERTANKO's and its members' activities in these markets. These laws include the anti-trust/competition laws which the United States, the European Union and many nations of the world have adopted to preserve the free enterprise system, promote competition and protect the public from monopolistic and other restrictive trade practices. INTERTANKO's activities will be conducted in compliance with its Anti-trust/Competition Law Guidelines.