Methanol – An Emerging Clean-Burning Marine Fuel

GPCA Methanol Seminar

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Methanol is a Future Proofed Fuel Capable of Meeting Increasingly Stringent Regulations

- IMO – ECA’s & Global Sulfur Regulations; Tier III NOx regulations for new vessels in 2016 in North America
- Regional regulations developing – China ECA’s (Dec 2015)
- Future: Global NOx? Particulate Matter? CO$_2$?

✓ Methanol is an ultra-clean fuel which can meet increasingly stringent emissions regulations

 IMO Marine Fuel Sulphur Regulations

Source: FCBI, IMO
Marine Fuel Emissions Comparison

- Methanol (MEOH) achieves low Sulfur, NOx, PM & bridge to lower CO$_2$ in the future (renewable methanol)

Source: Stena (4-stroke engine testing)
Methanol Fuel Costs are Competitive

- Methanol dual fuel engine allows you to switch between cheapest fuel (MGO or methanol)
- Methanol fuel costs have been lower than MGO in most regions historically and are competitive even in current low oil price environment

Source: Platts and IHS Chemical

MGO N.A. WC: Average of Los Angeles, San Francisco, Portland, Seattle and Vancouver MGO prices
MGO Europe: Average of Rotterdam, Hamburg
MGO Middle East: Average of Fujairah, Kuwait, Khor Faakan
Methanol: US Gulf Coast spot methanol price; adjusted to energy equivalent of MGO (2.16 factor)
Methanol is Available Around the World

- Widely traded globally; readily available through existing global terminal infrastructure
- Modest cost to build new terminal capacity or leverage off of existing diesel infrastructure
- Methanol Industry well positioned to supply global marine fuels industry

* Terminal locations are representative based on available information and is not a complete list
Methanex’s Waterfront Shipping Launching 7 New Methanol Flex-fuel vessels in 2016

- MAN 2-stroke, ME-LGI Methanol flex fuel engines
- 7 x 50,000 dwt vessels
- April – October 2016 delivery dates
- First two vessels launched in Korea April 2016
- Solid business case – modest incremental cost offset by flex-fuel cost savings
- Classification Bureaus - DNV-GL, Class NK

MOL Mitsui O.S.K. Lines
WESTFAL-LARSEN
MARINVEST
MethaShip
• Ship design for methanol cruise ship and ro-pax ferry
• German Government funded
• Meyer Werft (shipyard), FSG (shipbuilder), Lloyd’s, MAN, Caterpillar, HELM

LeanShips
• European Commission sponsored; Methanex is a partner
• Promote more efficient and less polluting ships
• Commercialize small-midsized ships /engines

China
• Green energy key tenant of China 13th 5-year plan (2016-2020)
• Ministry of Transport (MOT) – China ECA’s being phased-in 2017-2019; backing cleaner marine fuels
• Methanex partnering with MOT and other stakeholders to execute methanol pilot
Methanol – An Emerging Marine Fuel Alternative

- Clean Burning
- Economical Fuel Cost
- Modest Investment Cost
- Existing Infrastructure
- Fuel Flexibility
- Renewable Options
Thank You