

## Global Marine Fuel Trends 2030

The 8<sup>th</sup> World Ocean Forum 2014 Dr. Spyros E. Hirdaris Lloyd's Register Asia, Technology Group, South Korea





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## In 2013 we said shipping would double by 2030



# **Global Marine Trends 2030**

What type of ships? How many? Which routes?







## What about fuels and technology for deep sea shipping?



#### We have developed a new piece of research



# **Global Marine Fuel Trends** 2030

Which fuel? Which technology? CO<sub>2</sub> emissions?





#### We take our previous research forward





## 3 scenarios for deep sea shipping

Status Quo	Business as usual
	Short term regulatory solutions
	Economic growth at the current rate
Global Commons	International cooperation and trade agreements
	Emphasis on environment and climate change
	Expansion in globalisation
Competing Nations	Local production and consumption
	Regulatory fragmentation
	Brake in globalisation



#### Main assumption: maximum profit and regulatory compliance



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#### Deep sea shipping trade will grow in all scenarios



#### We considered many different options







#### Technologies to match the fuels





#### Efficiency technology affects the fuel mix

▲ Containers ▲ Bulk Carriers ▲ Tankers

Superstructure streamlining Wing pods Pulling pods **Contra-rotating props** Vane Wheel Prop section optimisation **Ducted Propeller** Pre-swirl duct Propeller upgrade Propeller boss cap fin Asymmettric Rudder Propeller rudder bulb Waterline extension Hull coating 1 (biocid Hull coating 2 (for Hull cleaning Propeller p Wind e Wi openings ation of water flow of openings 

Covering hull openings	<b>A</b> A
Speed control pumps and fans	<b>A</b> A
Energy saving lighting	<b>A</b> A
Efficient Boiler	<b></b>
Autopilot upgrade/adjustment	<b>A</b> A
Trim and ballast optimisation	
Optimisation of dimensions (fast)	<b>_</b>
Prop Hull optimisation	🔺 🔺 🔺
Skeg optimisation	
mproved Rudder	
Stator fins	
Solar Power (Hotel dry and wetbulk)	
Solar Power (Hotel container)	<b>_</b>
Optimisation of dimensions (slow)	<b>A</b> A
Air lubrication (air curtain with PTO)	<b>A</b> A
Air lubrication (cavity with PTO)	<b>A</b> A
Sails	<b>A</b> A
Shore power / cold ironing	
Main Engine Tuning Phase 1	<b>A</b> A
Main Engine Tuning Phase 2	<b>A</b> A



### Not all fuels/technology are equally competitive



## Only 2 fuels for deep sea shipping in the mix today



#### We will need twice as much fuel by 2030





#### 24% LNG compared to 2010 overall fuel demand



#### Different scenarios for CO<sub>2</sub> emissions



#### It will be an interesting transition

## Change cannot happen overnight

HFO will have a high but declining share in 2030

LNG will reach up to 11% of the Deep Sea fuel mix by 2030 There will be no "one size fits all" fuel and technology

Society's response to climate change will be a driver In a carbon-focused scenario, Hydrogen can emerge

#### **Dr. Spyros Hirdaris**

Lead Specialist Technology Group, Busan T +82 (0)51 640 5063 E spyros.hirdaris @Ir.org

Lloyd's Register Asia 10th Floor, CJ Korea Express Bldg. 119, Daegyo-ro, Jung-gu (2, 6-ga, Jungang-dong) Busan 600-700, Republic of Korea



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