



Mobilità sostenibile: trends, prospettive ed il ruolo del LNG

M. Dogliani – Technical Director

4 **C** (+ 1 **L**)

- **CHI**
- **CONTESTO**
- **COSA**
- **COME**
- **LNG**

Chi siamo?

Newbuilings
Parts

Maintenance

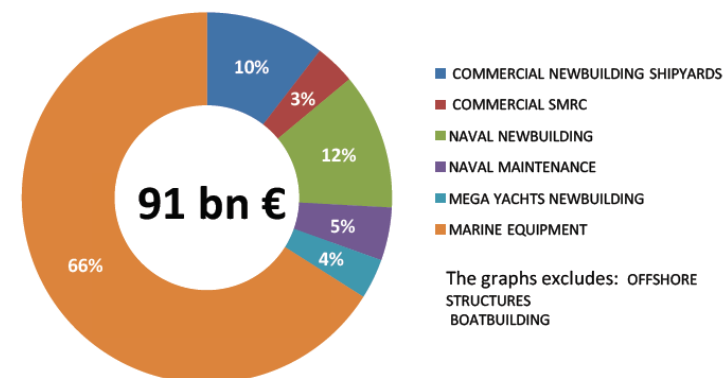
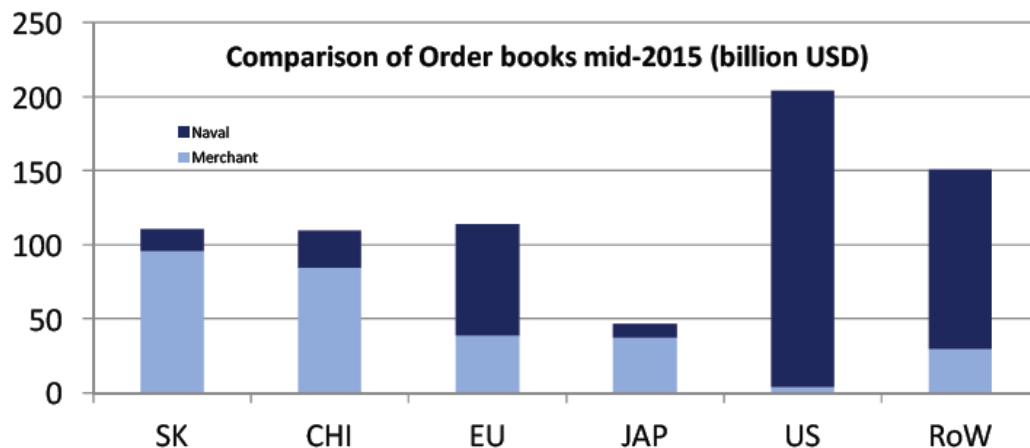
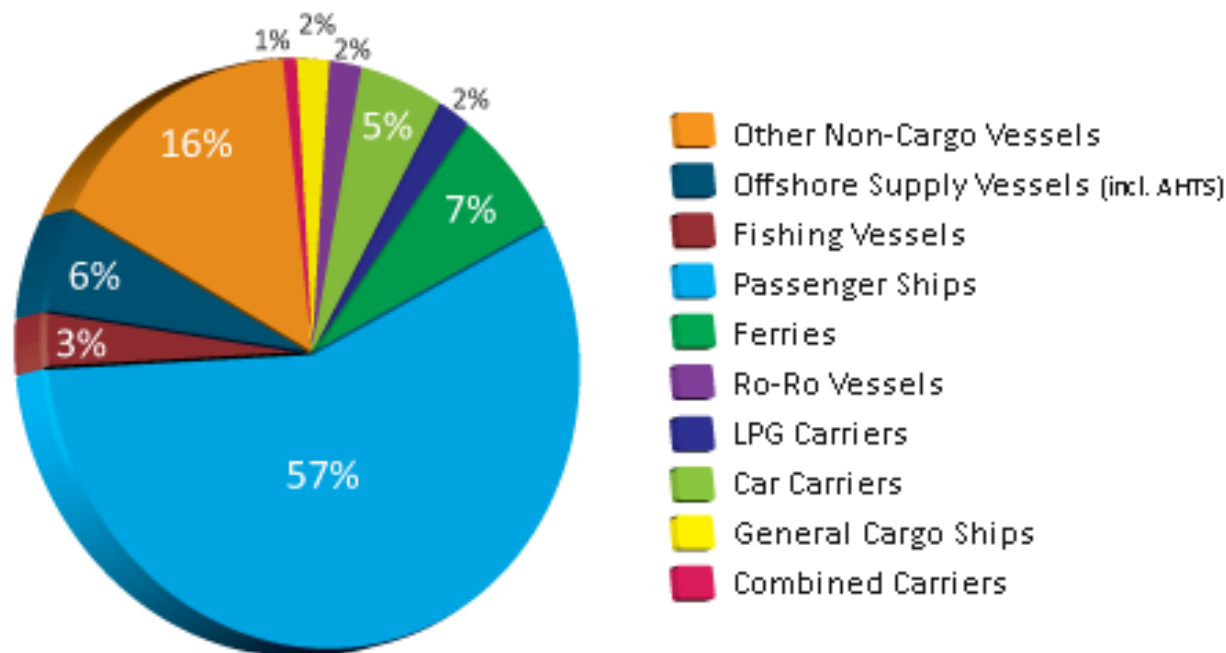
SEA Europe
Ships & Maritime Equipment Association

22000 companies

> 500,000
highly skilled
workforce

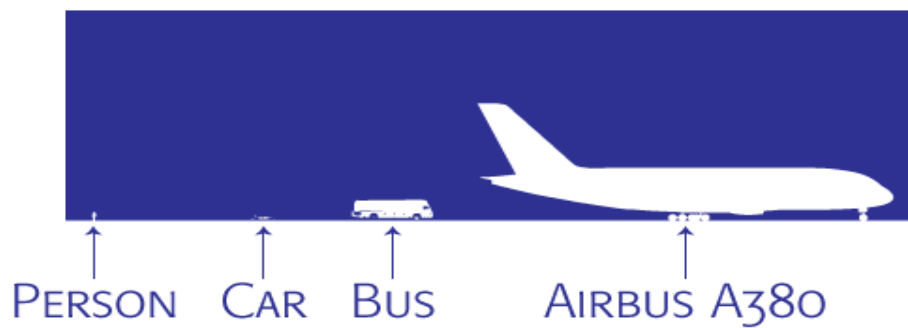


Chi siamo?

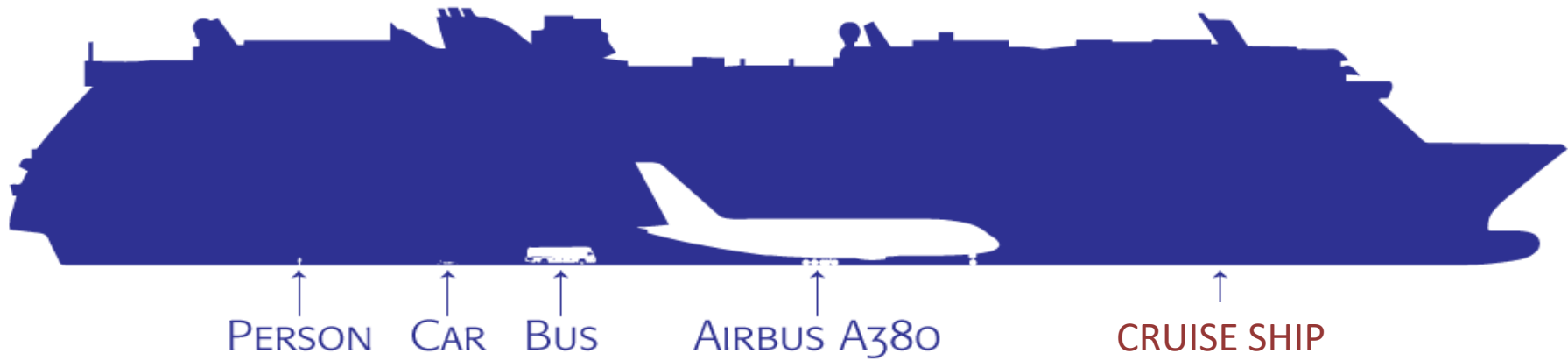


Source: SEA Europe

Chi siamo?



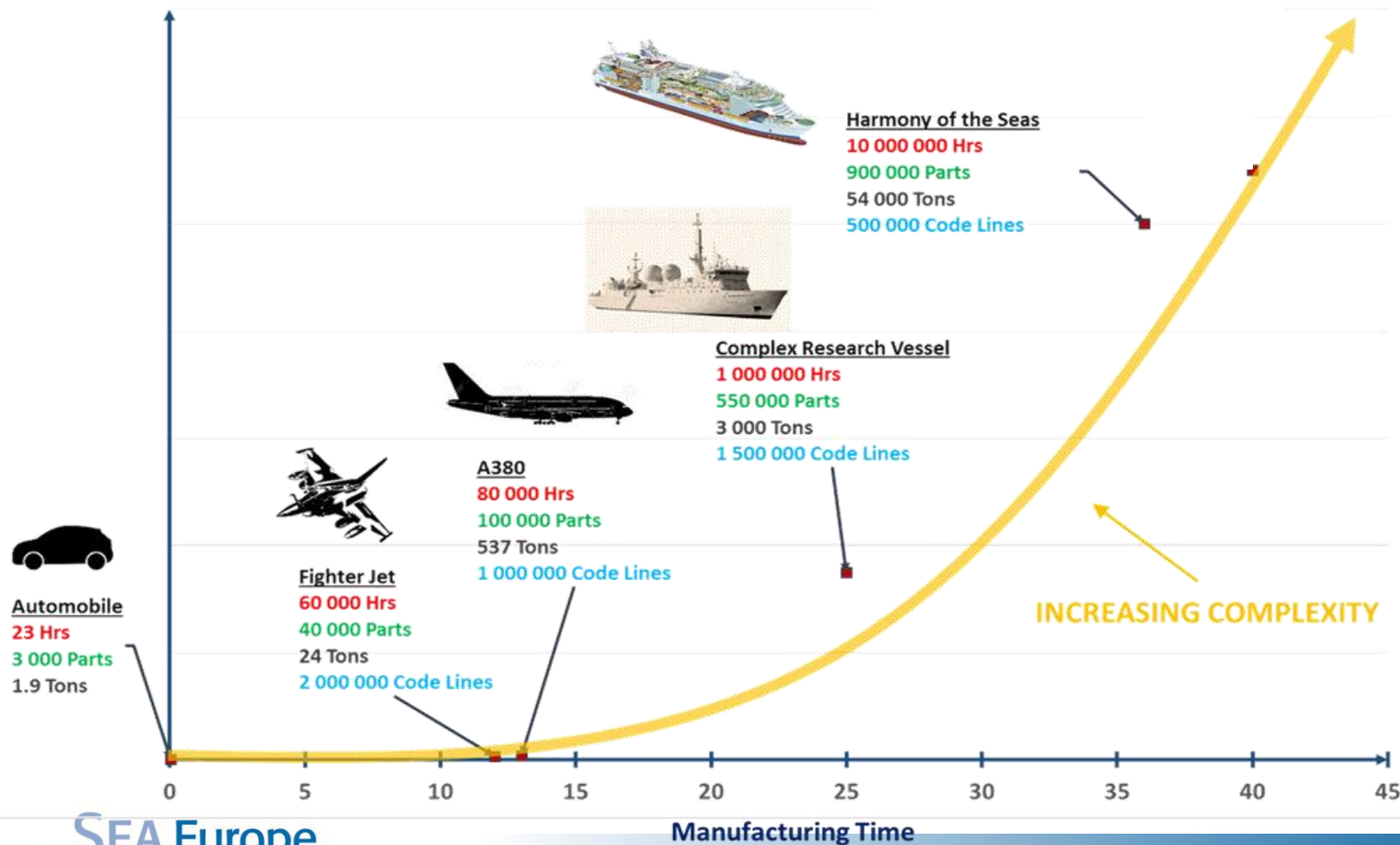
Who are we?



Chi siamo?

MARITIME INDUSTRIES : HIGHLY COMPLEX VESSELS

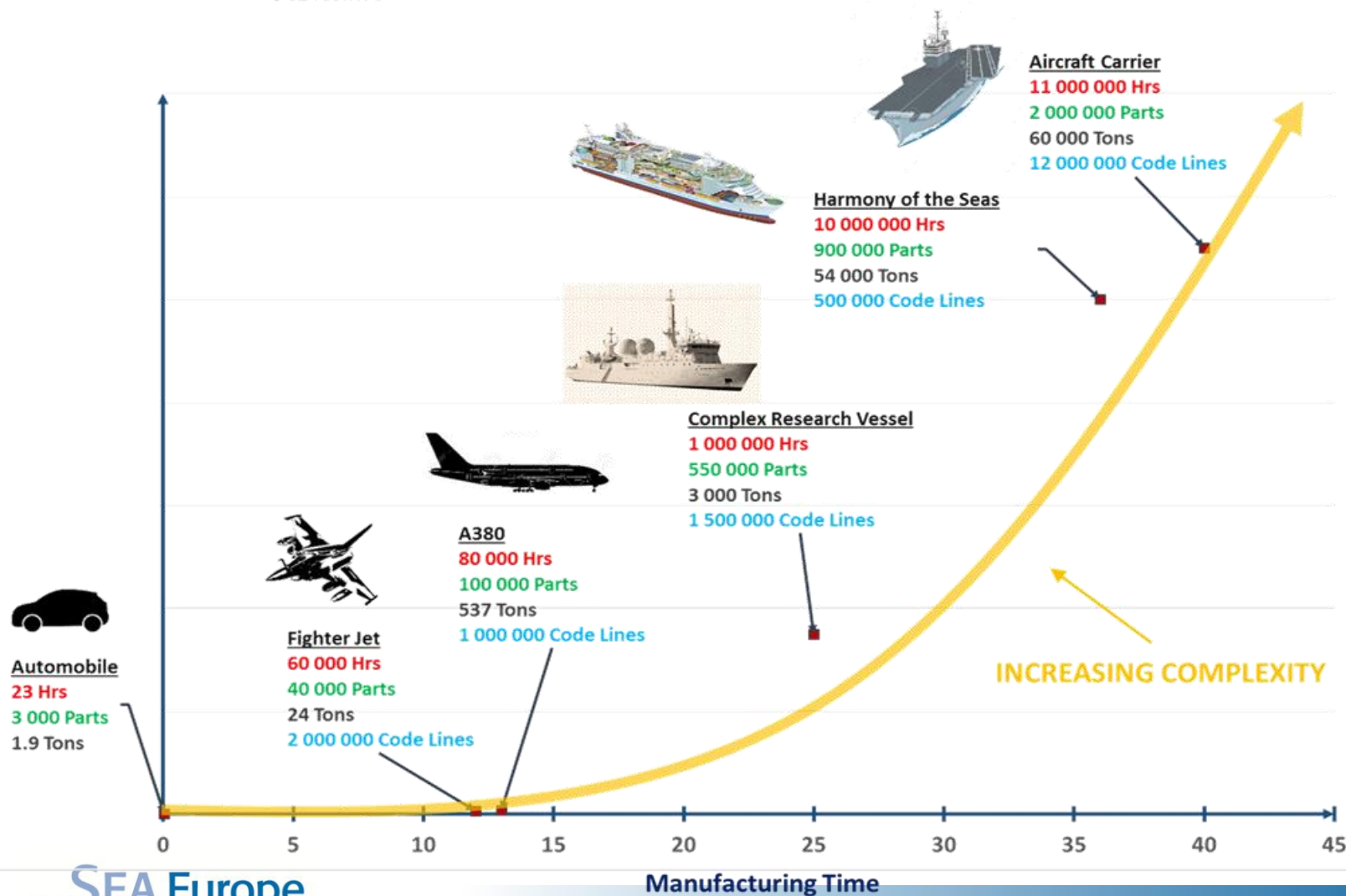
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Chi siamo?

MARITIME INDUSTRIES : HIGHLY COMPLEX VESSELS

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2014



After having completed the liquified natural gas sea trials, the F.-A.-Ga ferry built by Fincantieri in its shipyard at Castellammare di Stabia, left the yard on Wednesday sailing to Matane, in Canada.

The delivery to Société des traversiers du Québec will take place when the ferry arrives in Matane. Fincantieri said in a statement.

MSC Orders Four LNG Megaships

April 06, 2016

2016



2015

AIDA & COSTA



POLAND @ SEA

MARITIME MAGAZINE

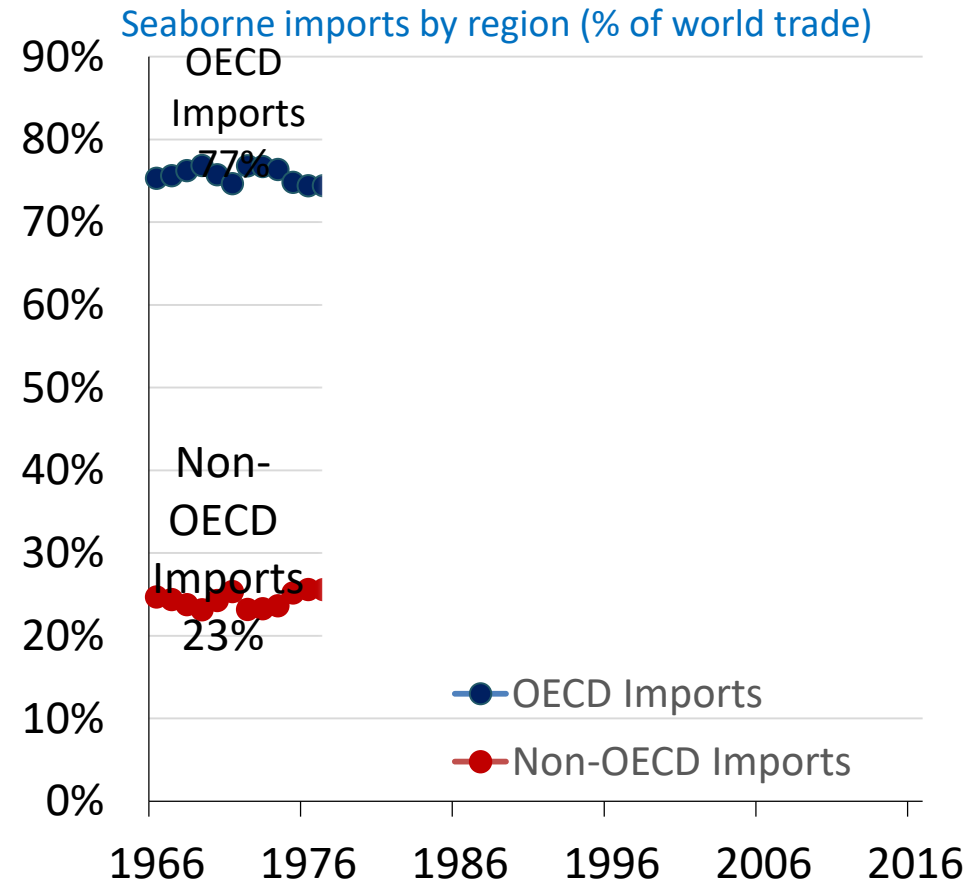
2016**Green ships
of the future**

Sea trade patterns are changing



Sea trade growing but OECD losing market share

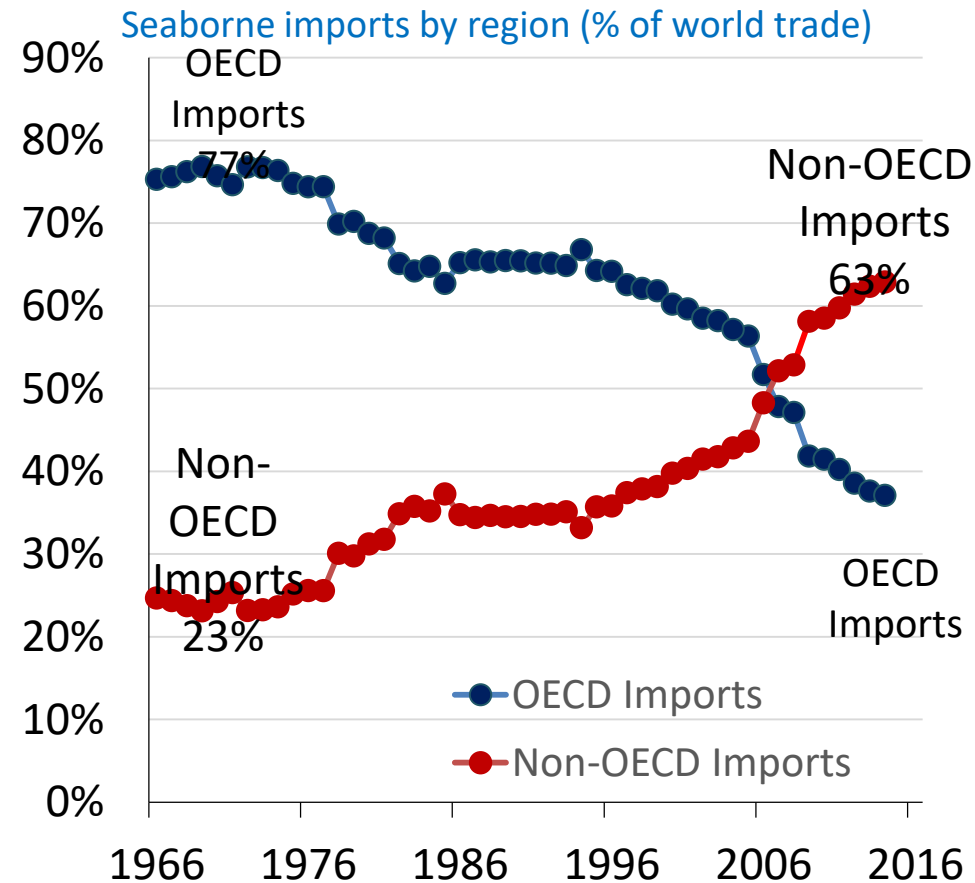
1. OECD now imports only 37% of cargo
2. China and Asia driving trade
3. Non-OECD 63% and maybe 75% soon
4. Non-OECD has six times the population



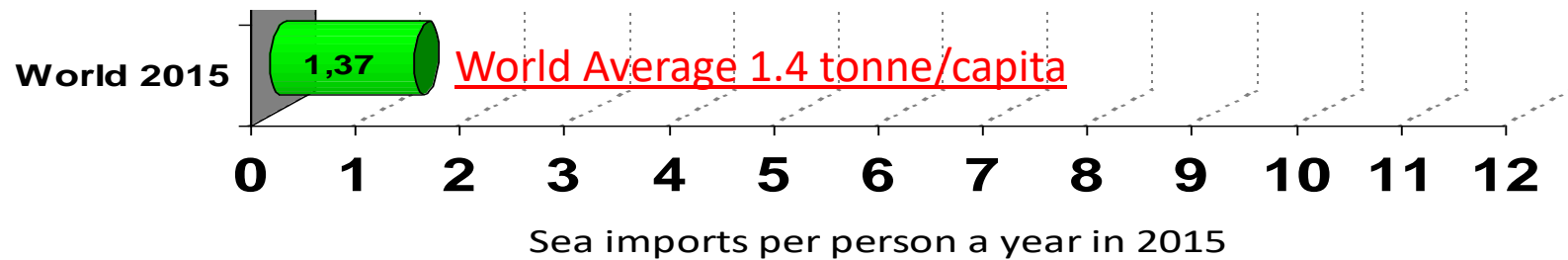
Source: Martin Stepford

Sea trade growing but OECD losing market share

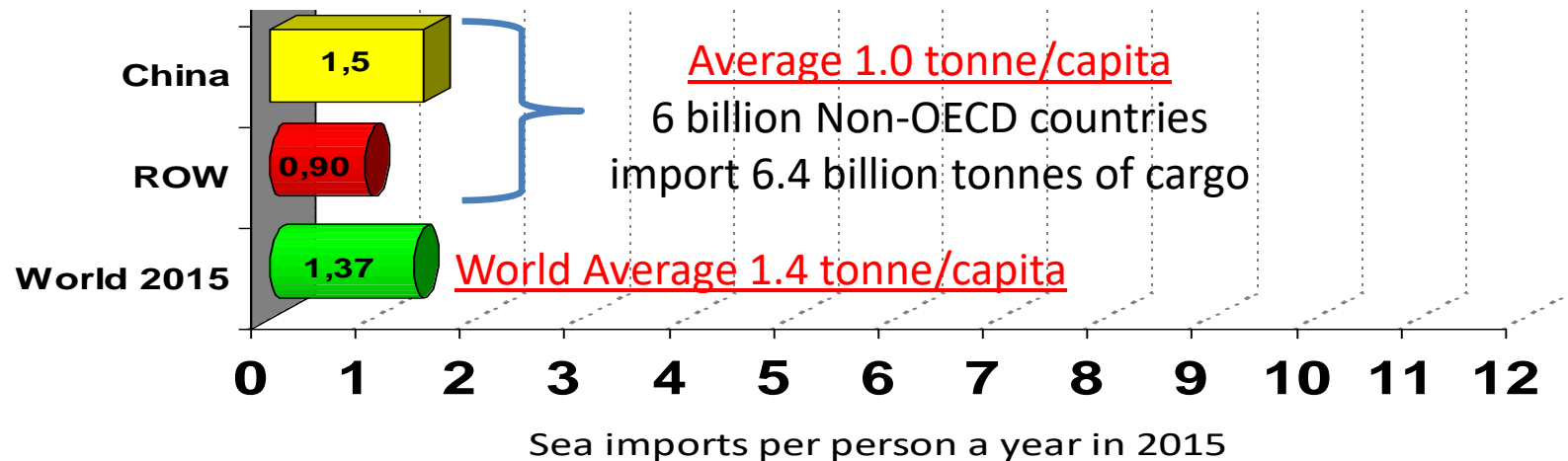
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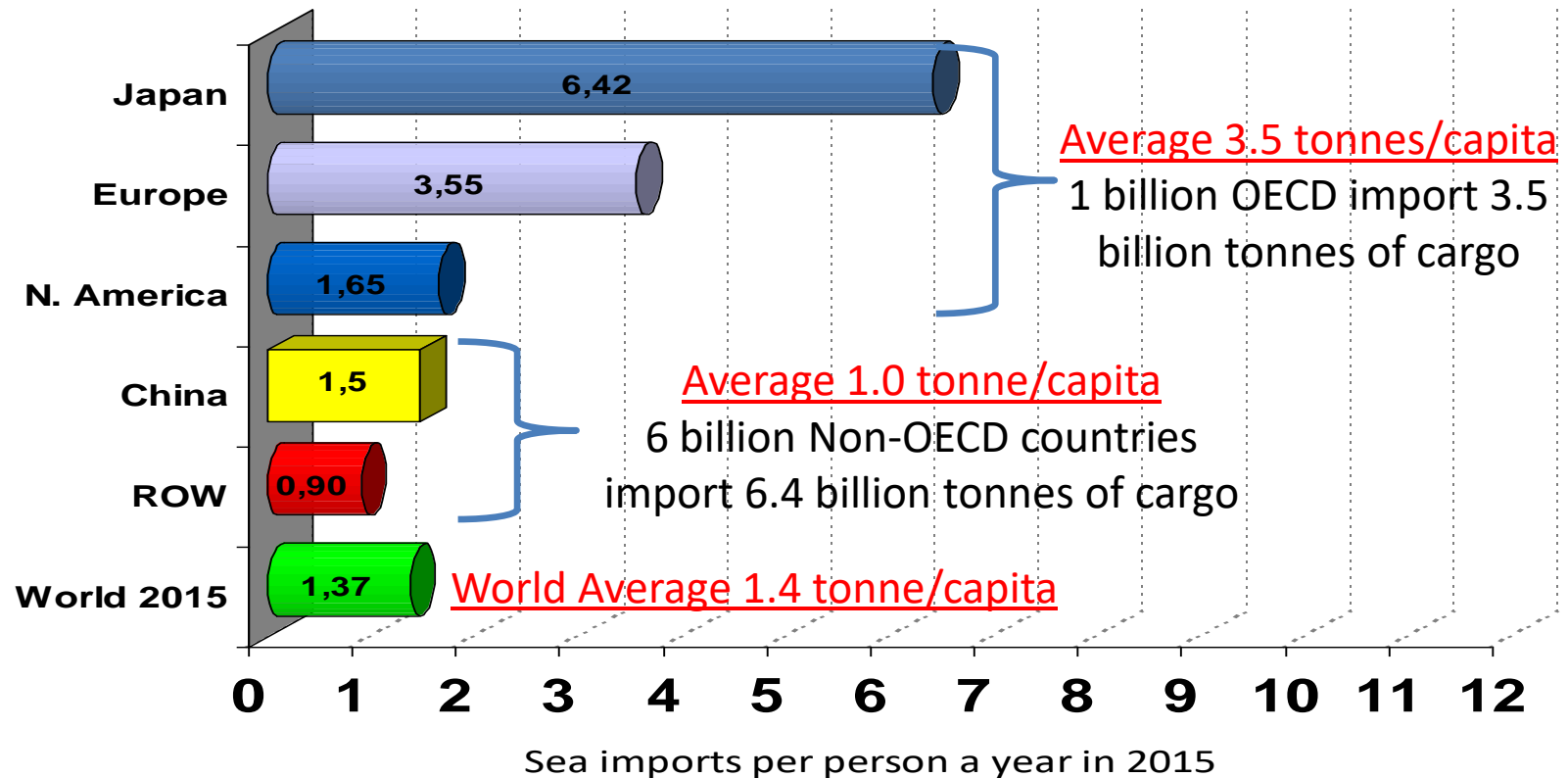
Source: Martin Stopford



Source: Martin Stopford



Source: Martin Stopford



Source: Martin Stopford



IMO agreement on technical regulations will reduce ships' CO₂

MARPOL Annex VI, Chapter 4 adopted July 2011 , which entered into force in January 2013





Challenge	Targets	References
Decarbonisation (energy efficiency)	At least 27% improvement in energy efficiency At least 40% cuts in greenhouse gas emissions (from 1990 levels)	Renewable Energy Directive
Decarbonisation (alternative fuels)	At least 27% share for renewable energy A core network of refuelling points for LNG at maritime and inland ports should be available at least by the end of 2025 and 2030 , respectively. Refuelling points for LNG include, inter alia, LNG terminals, tanks, mobile containers, bunker vessels and barges.	Renewable Energy Directive Alternative fuels infrastructure Directive
Decarbonisation (modal shift)	30% of road freight over 300 km should shift to other modes such as rail or waterborne transport by 2030	Communication “Roadmap to a Single European Transport Area...”
Decarbonisation (smart grids)	replace at least 80% of electricity meters with smart meters by 2020. This smart metering and smart grids rollout can reduce emissions in the EU by up to 9%	
Decarbonisation	EU cities should set up and deploy an Sustainable Energy and Climate Action Plan (SECAP) aiming at: <ul style="list-style-type: none"> defining the role of the various stakeholders in the implementation of the measures. 	Sustainable Energy and Climate Action Plan (SECAP)

COSA.....2030

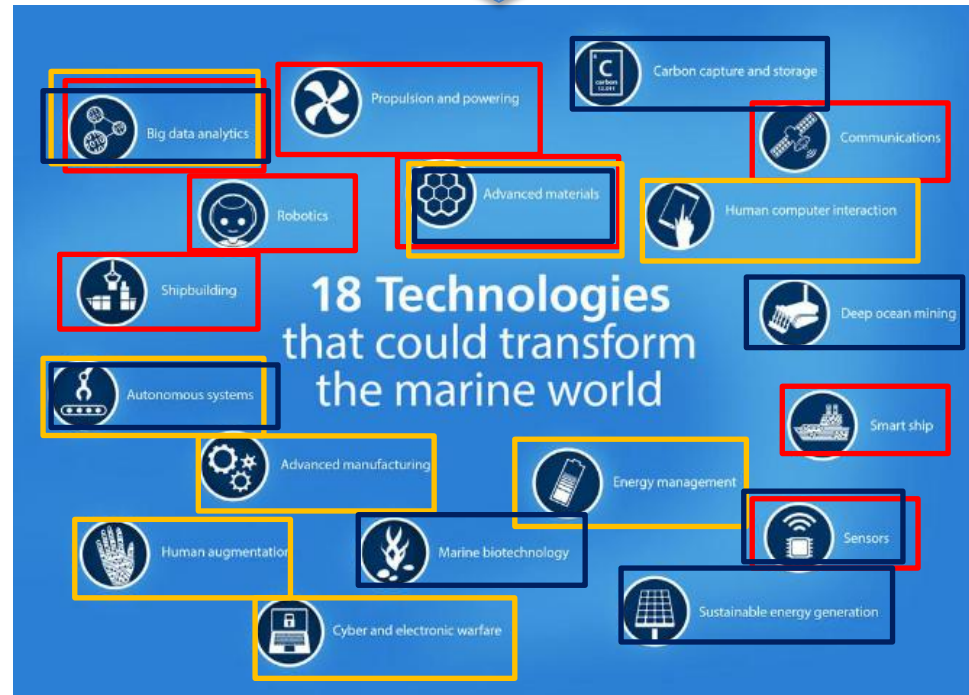
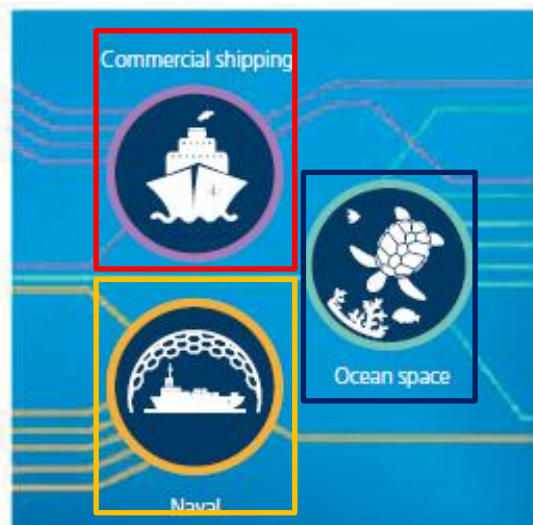


Global Marine Technology Trends 2030



QinetiQ

UNIVERSITY OF
Southampton



TechnoMax Ships will fundamentally change the business model of the shipping industry, in that it will be possible to obtain bespoke information and data on a 24/7 basis, thereby increasing commercial and regulatory effectiveness. For example:

TECHNOMAX LIQUEFIED NATURAL GAS (LNG) CARRIER 2030

TECHNOMAX CONTAINER SHIP 2030

TECHNOMAX BULK CARRIER 2030

TECHNOMAX TANKER 2030

TechnoMax Ships

A

Advanced Materials



As graphene is an excellent conductor of heat, so it can be used to manufacture products that would be a fraction of the weight of the ones currently produced – some alloys like copper-graphene and iridium-graphene could be applied. The use of this material will make the vessels lighter. The utilisation of graphene specifically manufactured for a given application, the enhancement of heat-transfer properties, will be developed for several components in the engine room, including heat exchanger pipes, filters, sea chests, condensers and boilers.

B

Big Data Analytics



Visualisation aid for machinery control will be heavily influenced by big data. Visual stations, located around the engine room and tanks of the vessel, will be able to record, store and display the featured parameters. By means of infrequent reporting structures, they will unleash the data they contain on the major data centre, based on the dome and back-up device. Later on, data will be easily accessible for remote monitoring purposes.

C

Smart Ship



Graphene sensors will be used to detect traces of atmospheric pollutants and emissions of the vessel for monitoring and reporting purposes.

D

Propulsion and Powering



LNG carriers will be heavily affected by future technology developments in relation to propulsion. Combined utilisation of dual-fuel diesel generators together with batteries and fuel cells will be commonplace. These engines will be fully electronically controlled, incorporating a number of electronic control modules and a sensor network able to control and manage the engine under the different load and fuel conditions. Methanol, ethanol and glycerol use will be common, alongside the current and new ECA areas around the globe. Graphene holds the key to an energy storage revolution. Highly porous graphene-based supercapacitors have been developed, which can fully charge in just 16 seconds and undergo this some 10,000 times without a significant reduction in capacitance. The collating of various power-generation and propulsion systems will therefore be key for this ship type.

E

Advanced Design Assistance



Combining virtual reality applications with classic design tools like CAD will help to design and allocate onboard equipment. Engine room circuits and cargo circuits will be easily designed, minimising cost and space. The use of productive augmented reality in technical assignments will be commonplace: from the visualisation of future facilities within a current production environment to the deviation measurement between a CAD model and the related assembly part. The use of augmented reality will also facilitate the negotiation phase of the vessel before the construction by means of electronic catalogues offered to the customers, showing the main vessel capabilities/arrangements. As such digital catalogues will help during the contract and design stage of the vessel. Visual tracking will be a commonly used tool for pose purposes.

Commercial Shipping Transformed

It is envisaged that these eight technologies will be implemented differently from ship type to ship type. These ships will be called TechnoMax Ships, as technology implementation will be at its most appropriate and fullest level in 2030. They will be operated differently from in the past, and will be smarter, data-driven, and greener, with flexible powering options, full on-board wireless connections, and digital connections through global satellites.

New Skills

New skills will be required to maximise the benefits of a fully integrated logistics supply chain. These skills will include:

- Big data management
- Big data analytics
- Automated operation and maintenance (O&M)
- Management of complex service constructs
- Management of data belts to keep them safe from cyber attacks and maintain its integrity

Crew

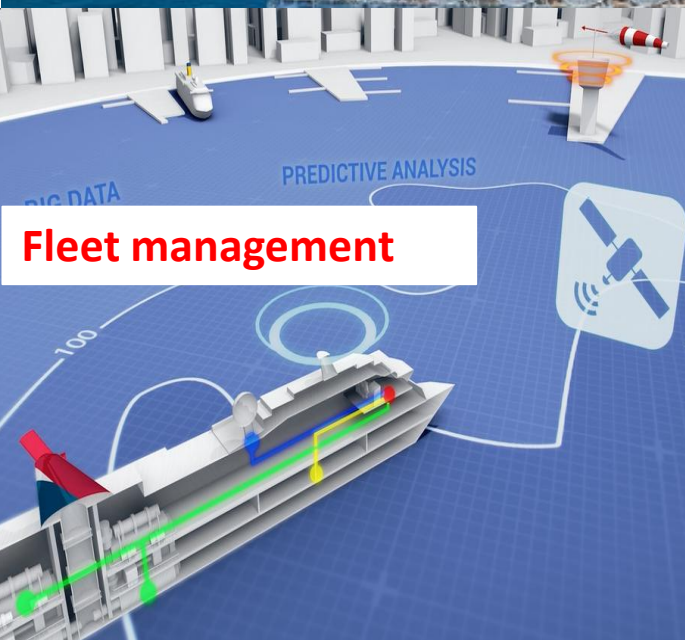
Due to the concurrent application of different kinds of technologies at different levels, a highly qualified and multi-skilled crew will be needed. The benefits of the balanced combination between a TechnoMax Ship managed by a highly skilled crew will be recognised by ship owners and ship operators. Effective action on the human element will require effort at the conception, design and construction stages of a ship's life, as well as throughout its operation.



Ship operations will be conducted partially or entirely onshore and remotely manned by personnel with doctorate degrees

LNG

COSA.....~~2030~~ 2020



SEA Human Capital **Skilled HR**



The European maritime industry has more than 500,000 people and around 300 shipyards. The industry is specialised in innovative and high tech vessels. European shipyards are first in the world in designing, building and vessels such as offshore vessels. The industry's most highly skilled staff innovate the most advanced complexity of products and innovations created and staff.

SEA Human Capital has access to and retains the best works, amongst others.



Maintenance

LNG

COSA.....2020



= 16 min



= 6000

Towards the LNG interoperable Italian network

The planned investments are part of a unique complementary and heterogeneous set of actions aimed at the realization of the LNG interoperable Italian network, covering both infrastructure and vehicles, on the sea and land side.

PORT FACILITIES



LNG port coastal storage

LNG port refueling station

LNG Shore-side electricity

LNG & Bio-LNG liquefaction plant

LAND LOGISTIC



LNG refueling station

Land Logistic: LNG ISO Container

Land Logistic: LNG tank truck

Land Logistic: LNG rail service

SEA VESSELS



LNG Bunkering ship

LNG boats & harbour vessels

LNG Cruise Ship

LNG Ferry

LNG fishing boat

LNG HSC

LAND VEHICLES



LNG Heavy Duty Vehicles

LNG terminal vehicles and equipment

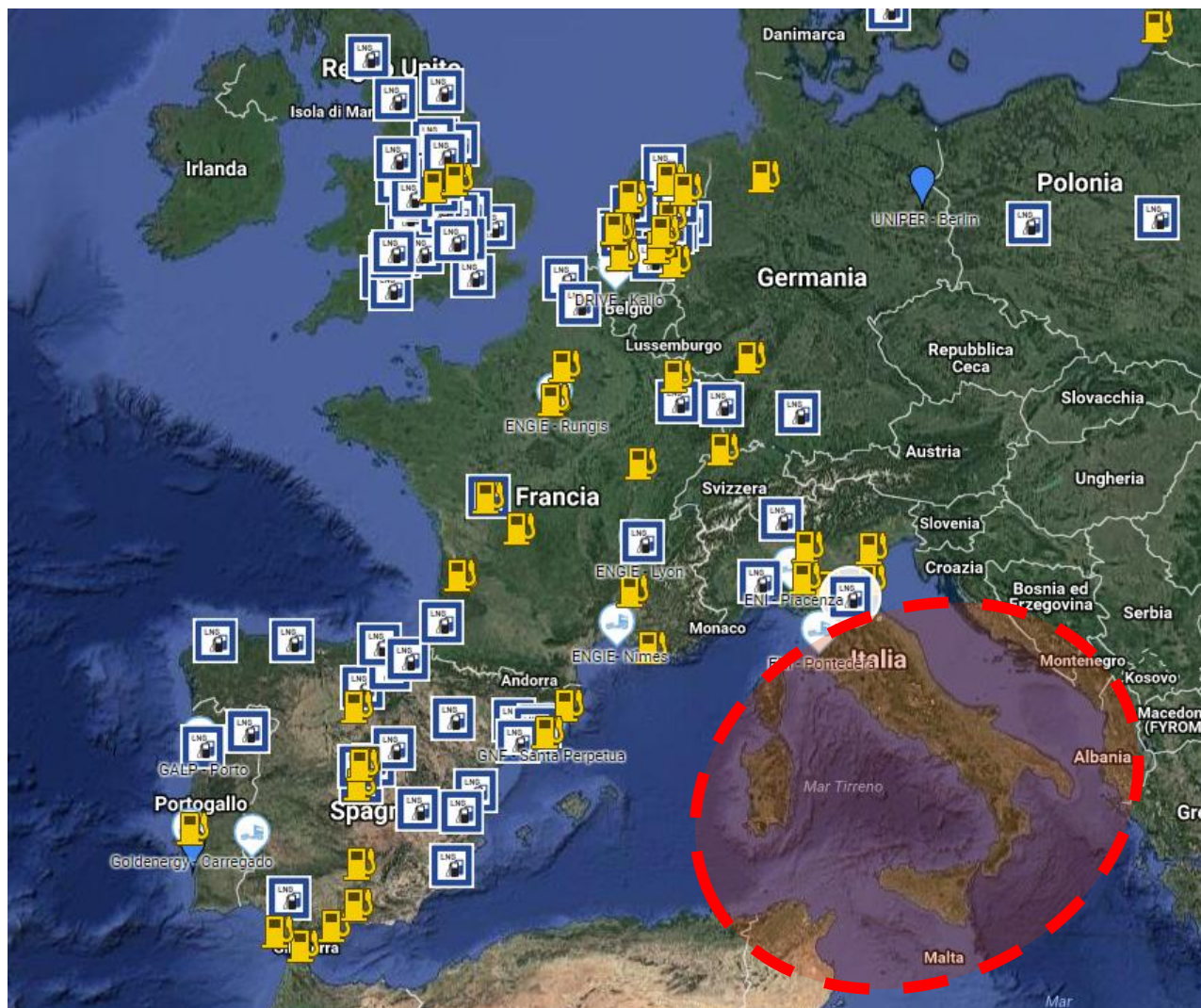
LNG rail tractors

LNG

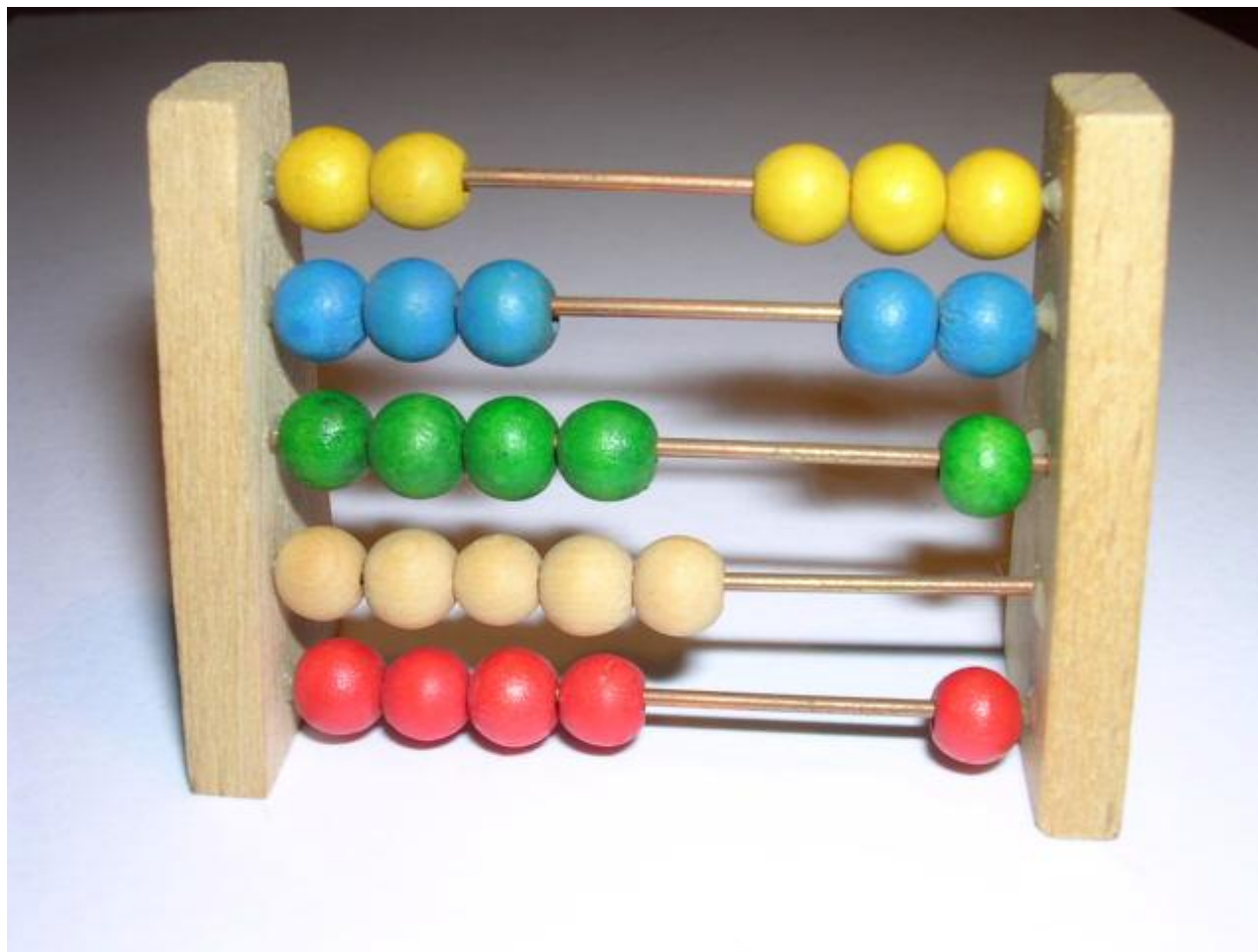
COSA....2020

GAINN 4MED

PS
&
PORT&SHIPPINGTECH



$$5 \times 20 = 100?$$



COMPETIZIONE

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When the going gets tough, the tough get going.

(Joseph P. Kennedy)

izquotes.com

md@seaeurope.eu