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Where do we stand with decarbonization and how can Newport help?

Newport Shipping and Newport Maritime Services

Marine Money Hamburg - February, 15th 2023

Regulatory timeline

2008: Base year

2018: IMO adopted initial strategy to reduce GHG emissions

2018-2023: Short term measures

- Technical and operational efficiency measures for new & existing ships (EEXI & CII)
- Improvement of EEDI & SEEMP
- National action plans, technical co-operation & capacity building

2023-2030: Mid-term measures to reduce carbon intensity of the fleet by at least 40%

- Low carbon fuels
- Market based measures (CO_2 tax)

2030-2050: Long term measures to reduce carbon intensity of the fleet by at least 70&

- Zero-carbon fuels
- Emissions reduction mechanism

2050: At least 50% reduction of total annual GHG emissions

As soon as possible in this century

- Zero GHG emissions

Biofuels and renewables

- Achieving the complete transition of the maritime industry to e-fuels such as ammonia and methanol would require ~2,000 Gigawatts of renewable energy

- Another estimate according to IRENA 2022, by 2050, shipping will require a total of 46 million tonnes of carbon neutral hydrogen for e-fuels production. Based on current technology, this equates to 500GW of electrolyser and 1,000GW * of renewable electricity capacity

- 100 units of renewable energy to produce e-fuels, output at the propeller stands at just 25 units

- *** 1GW = 3.125m PV panels (based on a silicon model panel size of 320 watts) or; 333 Utility-Scale Wind Turbines (based on average utility-scale wind turbine size of 3mW installed)**

Tools for decarbonization

Logistics and digitalization	Hydrodynamics	Machinery	Fuels and energy	After treatment measure
Speed reduction	Hull coating	Machinery improvements	LNG, LPG	Carbon capture and storage
Vessel utilization	Hull-form optimization	Waste-heat recovery	Biofuels	
Vessel size	Air lubrication	Engine de-rating	Electrification	
Alternative routes	Cleaning	Battery hybridization	Methanol	
			Ammonia	
			Hydrogen	
			Harvesting from surroundings (including wind and rotor sails)	
>20%	**5-15%**	**5-20%**	**0-100%**	**>30%**

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Financing requirements

- To decarbonize shipping, by 2050 between US$ 1-1.4 trillion investment into the industry is estimated to be required

Key points points of progress (August 2022 vs. 2018)

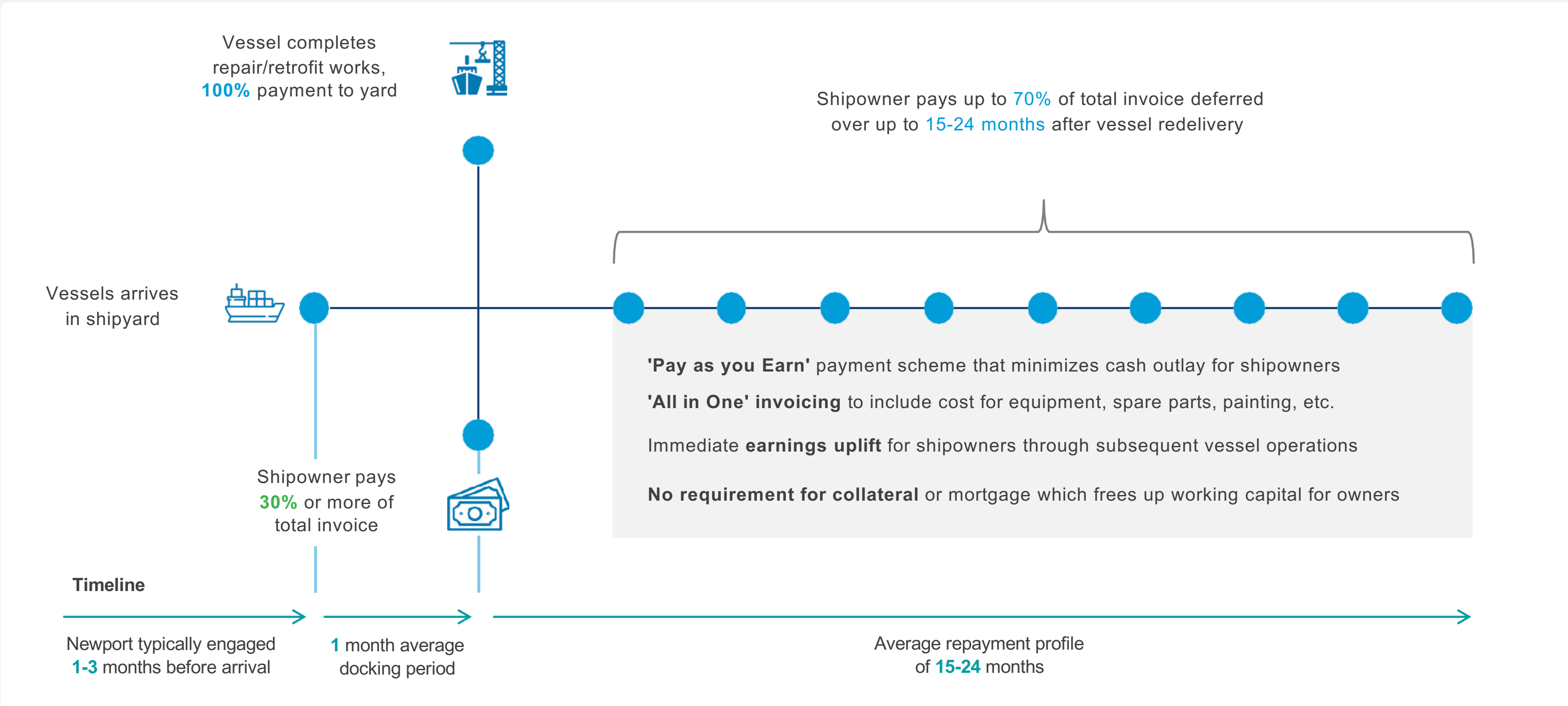
	August 2018	August 2022
Fleet (m GT)	1,333	1,513
Orderbook (m GT)	160.7	174.9
Orderbook (% fleet, dwt)	11.4	9.7% (vs. 51% in 2009 peak)
Orderbook Value (USD bn)	236.4	285.6
Containership Orderbook (m TEU)	2.6	7.0
Containership Orderbook (% fleet)	11.9	27.6
Average Age of Fleet (5,000+ GT)	11.5	13.2
SOx Scrubber Fitted Fleet	407	4,664
% Fleet BWMS Fitted (GT)	23.7	67.3
% Fleet EST Fitted (GT)	18.7	23.8
% Fleet Alt. Fuel Capable (GT)	2.8	4.7
% Obk. Alt. Fuel Capable (GT)	14.3	42.1% (but, 61% as of 2022 end)
Ports with LNG Bunkering	88	149
Source: Clarksons Research	*https://insights.clarksons.net/smm-back-from-a-break-with-green-and-tech/*	

How can we help?

Global ship repair and retrofit services

- *8 offices worldwide – London HQ*
- *150+ global service team*
- *15 partner shipyards*
- *38 repair docks*
- *2,500 annual slots*

Highly attractive deferred payment model



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Priorities

- GHG emissions are cumulative
- LNG has global availability at scale, safety record, established infrastructure and other existing advantages over alternatives such as energy density

Fuel	Energy Density (MJ)
IFO	41 MJ / kg
Ammonia	19 MJ / kg
Methanol	20 MJ / kg
LNG	54 MJ / m3

Capabilities

Turnkey decarbonization program ensures that the LNG retrofit investment is aligned with strategic and commercial goals.

<u>Advantages:</u>

- Proprietary design with AiP status (Bureau Veritas and DNV)
- Detailed evaluation of retrofit options for each vessel in your fleet
- Access to turnkey execution with our partner yards and suppliers
- Access to FINANCE to support the retrofit investment - Newport can structure customized financing solutions for the retrofit project

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Can you afford to retrofit?

Engineering Feasibility Study

Vessel

Technical Profile
- Vessel type / age
- Engine type / maker
- Engine room details
- Vessel general arrangement
- Propulsion system

Operational Profile
- Fuel consumption
- Trading route
- Voyage days
- Ballast days
- Port days

LNG System

Solution →
- Retrofit
- Replacing

LNG Fuel Gas System →
- Tank Type
- Tank Capacity
- Tank Pressure
- Tank Structure
- Bunkering Method

Suppliers →
- TGE Gas Engineering
- Defon 湖北迪峰换热器
- CIMC ENRIC ENERGY ENGINEERING (S) PTE LTD 中集安瑞科油气工程（新加坡）有限公司
- LGM ENGINEERING 国鸿液化气机械工程(大连)有限公司 Gloryholder Liquefied Gas Machinery (DL) Co.,Ltd
- WÄRTSILÄ
- MAN Energy Solutions Future in the making

Financing

Project Credit Rating

- Vessel Owner / Manager Profile
- LNG expertise
- Market Segment
- Vessel Charter Hire
- Vessel OPEX

→ **Financing Ratio**
Repayment Period

Can you afford to NOT retrofit?

Risk factors:

- Reputational
- Environmental
- Litigation
- Financing
- Insurance

Conclusion

Let's make shipping an inspiring case study of how an entire industry can decarbonize!

Disclaimer

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