OLDENDORFF

1921 100 2021

CII IS NOT THE ANSWER

What do we do now?

Oldendorff has no hidden agenda.

This is not a sales pitch. We wish to unite the global shipping community to find ways to reduce emissions. Not with fancy formulas on a piece of paper, but with actual and meaningful reductions.

Being green requires investment, which we are willing to make to remain an industry leader.

We believe all owners, charterers and brokers must act as good citizens and work together to achieve these goals.

We are all in this together!

OPENING STATEMENT

CII IS NOT THE SOLUTION

- While we respect the IMO and will fully comply with the CII regulations, we see the next 2-3 years as a learning curve. In the meantime, we need to work together to find better ways to reduce emissions.
- In seeking better solutions, we also need to work together to minimize unintended operational challenges and negative consequences from the CII regulations.
- We are sharing and discussing this presentation with the larger broker houses and our clients. We are offering full transparency. Our goal is to be in sync with you as to how we approach this topic: internally and externally; towards market including operational challenges and clauses; and who pays for what, etc.
- Please feel free to share this presentation on management level within your company.

Responsible Shipping

Leading the way

At Oldendorff, we strive for operational excellence and closely align our business operations with the **United Nations' Sustainable Development Goals.**

That said, the CII regulation creates unintended consequences.

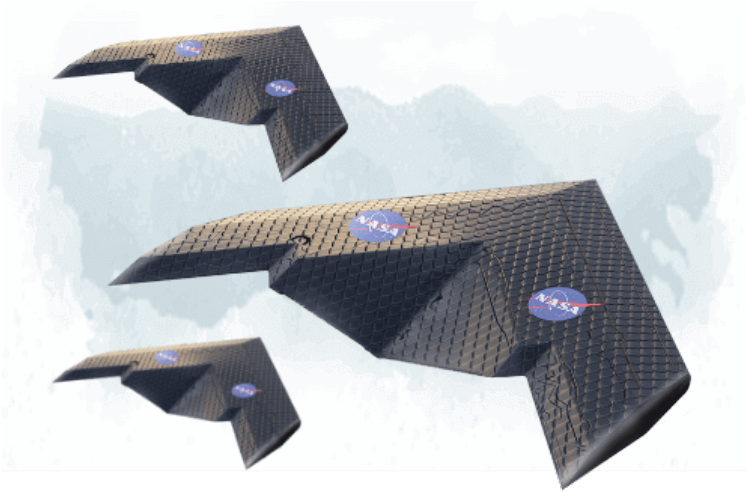
Let's discuss how to reduce Drybulk's Carbon Footprint

Winner – Neptune Awards

The Most Devoted Sustainability Promoter of the Year 2019

RESEARCH AGREEMENT WITH MIT

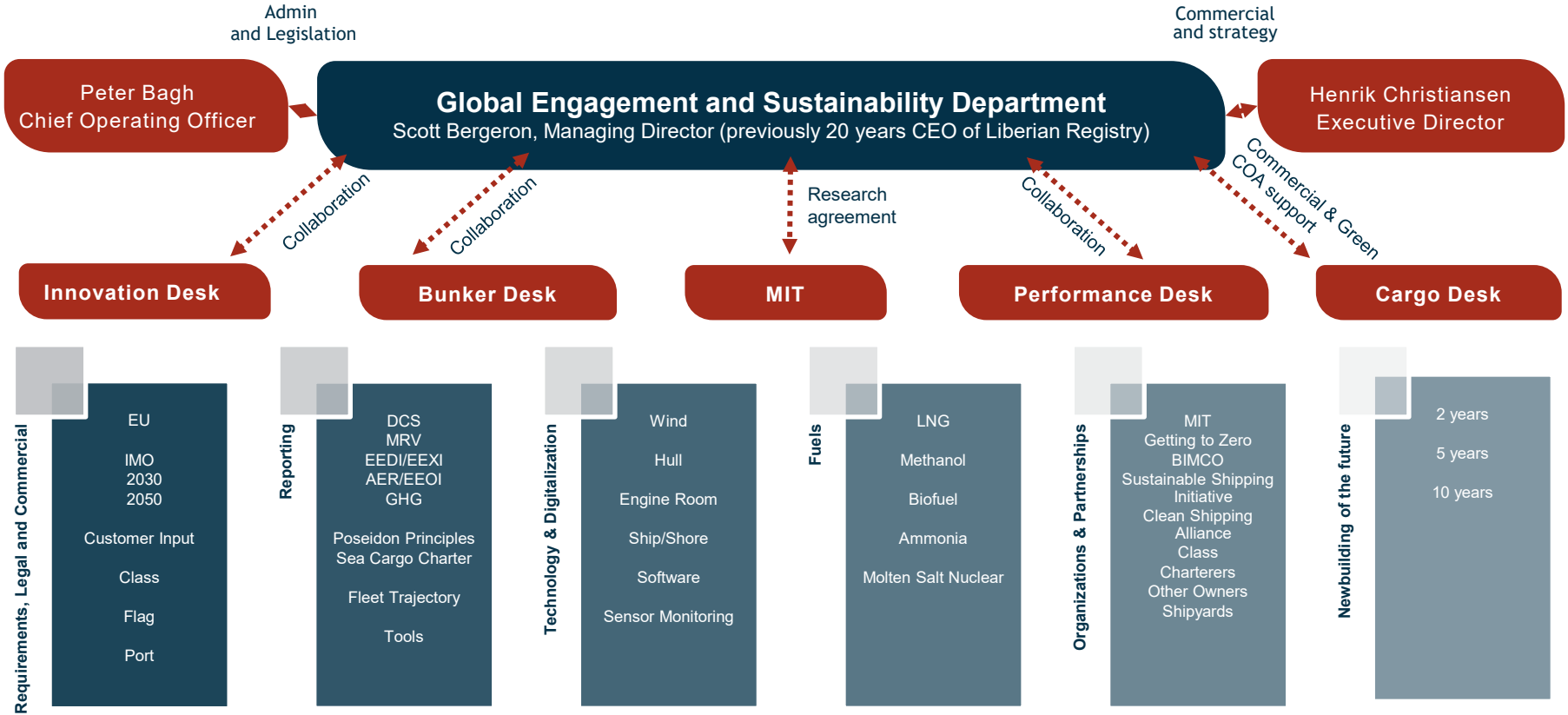
Oldendorff signed a research agreement with the Massachusetts Institute of Technology's Center for Bits and Atoms (CBA) in November 2019 to fund extensive research in improvements in ship design and propulsion to achieve the IMO 2030/50 GHG reduction requirements.



THE CENTER FOR BITS AND ATOMS
Massachusetts Institute of Technology

The initial emphasis has been directed at improving hydrodynamic efficiency, which builds on work CBA has been doing with the aerospace and automotive industries. We are also conducting extensive research on biofuels and the lifecycle analysis of the energy supply chain.

OUR INNOVATION STRATEGY AND TEAMS



IMO MEMBERSHIP STRUCTURE

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175

Member States and three Associate Members

- 1 Vote per country, but Flags with larger tonnage ultimately have “stronger” voice.
- Oldendorff Carriers engages with IMO Member States that we are associated with through our business operations and locations.

66

Intergovernmental organizations that have observer status

- Examples: European Commission, Paris MoU, Tokyo MoU, INTERPOL, etc.…

85

International non-governmental organizations that have consultative status

- There are 85 international non-governmental organizations in consultative status with IMO
- Oldendorff Carriers is an active member of several NGOs with IMO Consultative Status

<u>The IMO Process is Complex:</u> The diversity of opinions and perspectives of these entities strengthens the IMO but creates challenges to find common ground with effective and timely solutions.

REGULATORY LANDSCAPE

IMO

Absolute reduction target:

GHG ↓ 50% by 2050*

Intensity reduction targets:

CO_2 ↓ 40% by 2030*

CO_2 ↓ 70% by 2050*

*compared to 2008 levels

Note: IMO targets are being reviewed and the IMO GHG strategy is expected to be revised in 2023

EU

Absolute reduction target:

GHG ↓ 55% by 2030**

Intensity reduction targets:

GHG ↓ increasing to 75% by 2050***

**compared to 1990 levels

***compared to 2020 baseline

REGULATORY LANDSCAPE - CII

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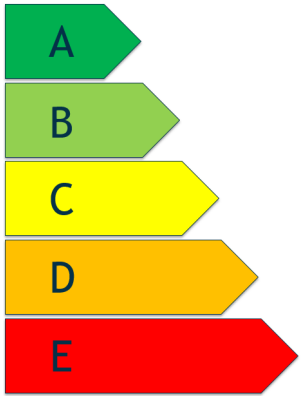
Annual Efficiency Ratio (AER)	Energy Efficiency Operational Indicator (EEOI)
Adopted by the IMO as the official CII for their A-E ranking system	Adopted by the EU for MRV
Adopted by the Poseidon Principles (Banks and Marine Insurers)	Adopted by the Sea Cargo Charter (Charterers) and the Baltic Exchange
FORMULA: $\frac{\text{Full Voyage Fuel Burned * Carbon Factor}}{\text{Summer DWT * Full Distance}}$	**FORMULA:** $\frac{\text{Full Voyage Fuel Burned * Carbon Factor}}{\text{Cargo Intake (MT) * Laden Distance}}$
Result → grams of CO2 per **DWT**-nautical mile	Result → grams of CO_2 per **tonne**-nautical mile
ANOTHER WAY TO CONSIDER IT…. $\text{AER} = \frac{\text{Environmental cost}}{\text{Benefit for society}}$	**ANOTHER WAY TO CONSIDER IT…** $\text{EEOI} = \frac{\text{Environmental cost}}{\text{Benefit for society}}$
This is a “supply-based” efficiency metric, a measure of the theoretical carbon intensity of the fleet because it divides the amount of CO_2 a ship emits by its cargo carrying capacity (deadweight tonnes), no matter how full the ship is, and then by the distance the ship traveled in a year (gCO_2/dwt-nm).	This is a “demand-based” efficiency metric, a measure of the real-world carbon intensity of the fleet because it estimates how much carbon dioxide (CO2) was emitted to transport 1 tonne of cargo 1 nautical mile (gCO2/t-nm).
Basically treats vessel as always fully laden. Does not punish intake or ballast legs. Rewards ballast as less fuel per same distance compared to laden.	Punishes high-stowage cargoes (e.g. wood chips), draft restricted ports (common in developing countries) and longer ballast legs.

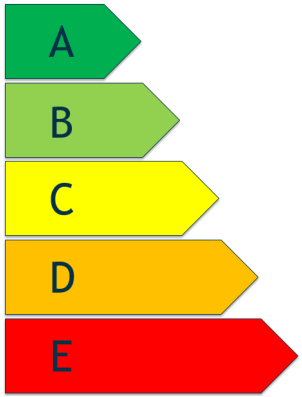
IMO'S CII RANKING LABEL SCHEME

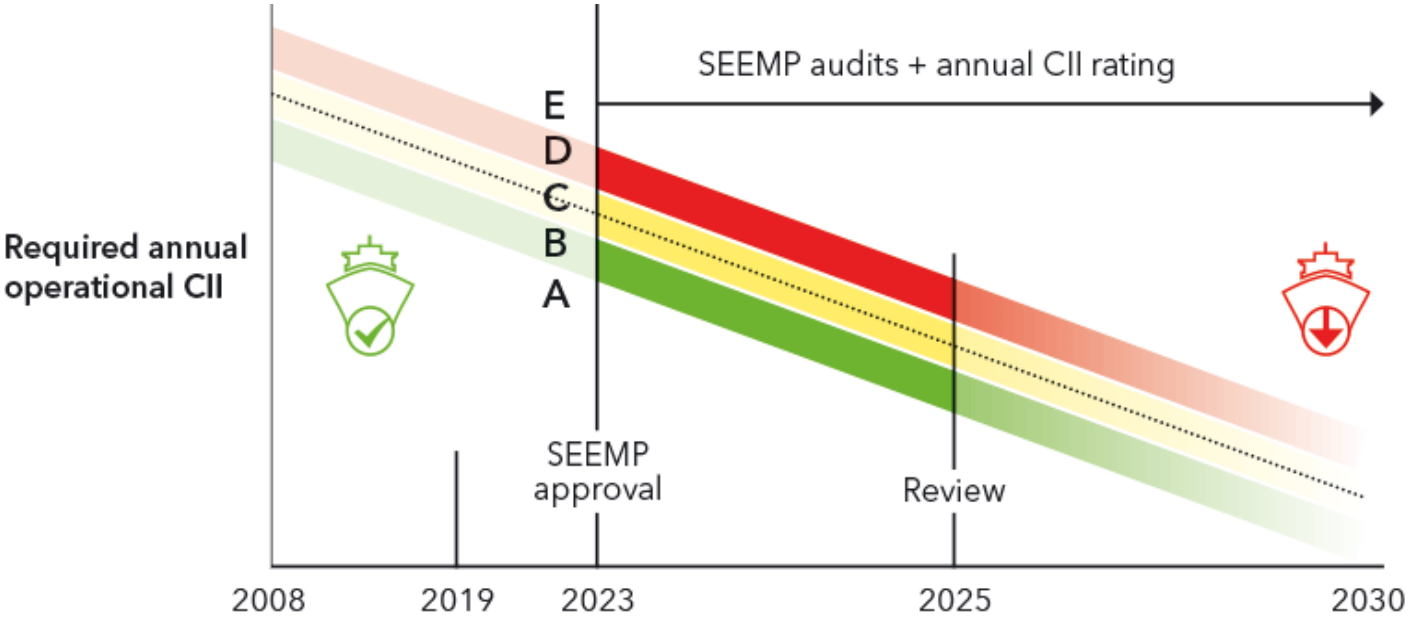


- Beginning in 2024, each ship will be assigned an IMO CII rating from A to E, based on the prior year IMO DCS data and where the resulting AER (Annual Efficiency Ratio) lands on the IMO emission trajectory for the deadweight of the ship.
- The emission trajectory changes by 2% per year, thereby becoming increasingly stringent towards 2030.
- Ships that achieve a D rating for three consecutive years or an E rating in a single year, require a class/flag approved corrective action plan as part of the SEEMP.
- Corrective action can include: depowering the ship, using fuel with a lower carbon content, permanent slow steaming, installation of energy saving devices.
- This A-E rating is based on actual voyage emissions, which is very different from Rightship's GHG Rating A-G, which is based on design and theoretical criteria.

Rating	Explanation	Factors impacting CII/AER rating
A	Only the highest performing vessels	The AER rating is impacted by a combination of technical energy efficiency of the vessel and operational efficiency of the vessel. Several factors impact operational efficiency, including weather routing, hull dynamics, vessel speed, port stay turn around time, vessel idling, carbon intensity of the fuel, etc. Note that long distance voyages positively impact the AER.
B	Vessel is performing above average	
C	Vessel is in compliance	
D	Vessel is perfoming below average, D-rating allowed for max 3 consecutive years	
E	Vessel is performing below average and corrective action plan must be developed immediately	

REGULATORY LANDSCAPE – CII RANKING SCHEME



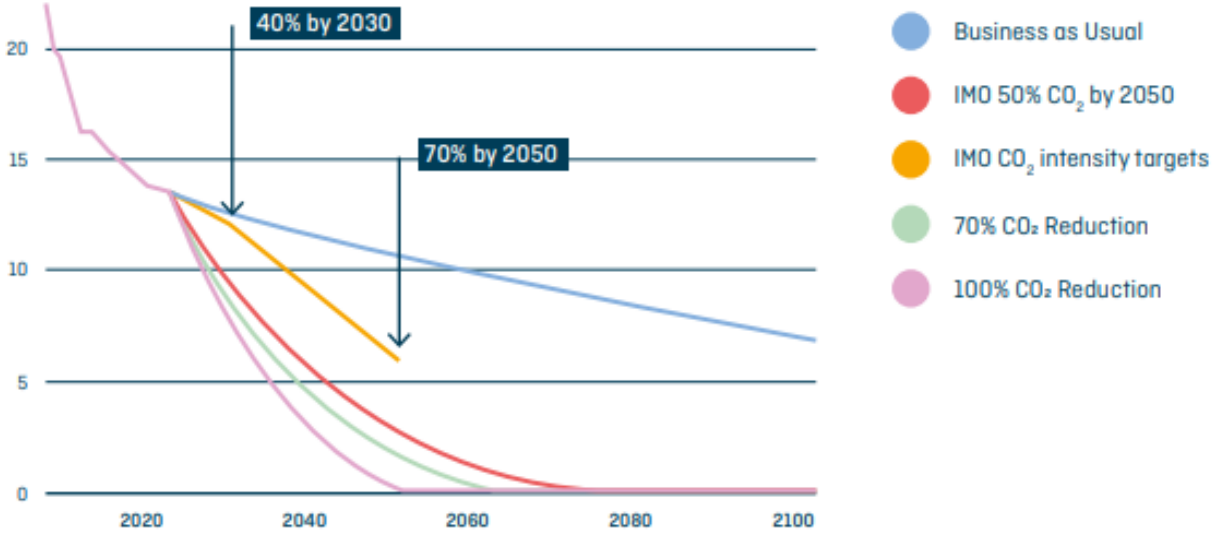


The Y-Axis is dependent on ship DWT

Source: DNV

SEA CARGO CHARTER

- A voluntary industry initiative.
- Decarbonisation commitment from charterers in the supply chain (cargo charterers, vessel charterers, disponent owners, etc.)
- CII metric: EEOI. Benchmarked against increasingly stringent trajectory.
- Currently 34 signatories (i.a. ADM, Anglo American, Bunge, Cargill, COFCO, Enviva, Holcim, Louis Dreyfus, Tata Steel, Trafigura, Wilmar).



SCC uses EEOI, motivating ballast efficiency, but penalizing higher stowing (less dense) cargoes.

Graph shows SCC's trajectory model underpinning their benchmark values.

Note that the SCC uses their view on required intensity reductions which are steeper than IMO intensity targets.

Charterers starting to realize their trades don't align well with SCC.

Others are trying to avoid ballast consumption.

Source: Sea Cargo Charter

RIGHTSHIP GHG RATING SYSTEM

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DIETRICH OLDENDORFF

SAFETY SCORE 4 / 5 | GHG A+ Verified | REQUEST A RIGHTSHIP INSPECTION
RightShip Inspection recommended* Request Now

IMO 9860350 Bulk Carrier 100,449 DWT 2.7 y/o In Trading Fleet **Flag** Liberia **Class society** Nippon Kaiji Kyokai

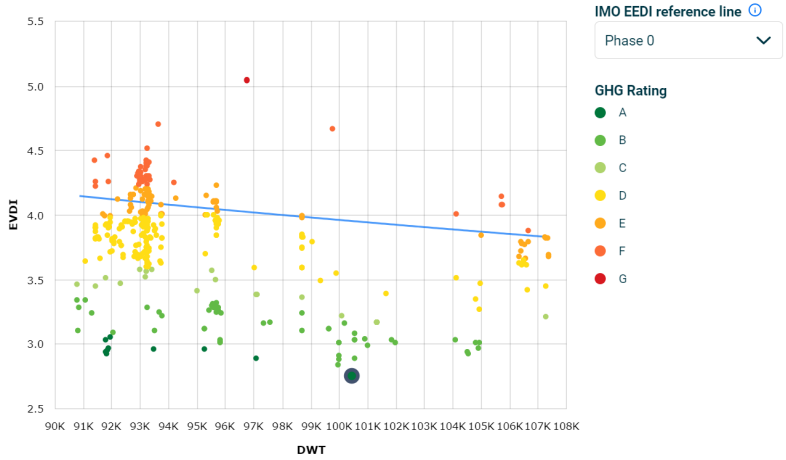
OVERVIEW | SAFETY SCORE | GHG RATING | DETAILS | ACTIVITIES | more •••

- GHG Rating Summary
- GHG Rating Factors
- GHG Rating peer group
- How can I improve?

RIGHTSHIP

GHG Rating peer group

This graph shows those vessels included in the GHG Rating peer group. Each dot represents a vessel, plotted using their EVDI and DWT against the IMO EEDI reference line.



IMO EEDI reference line
Phase 0

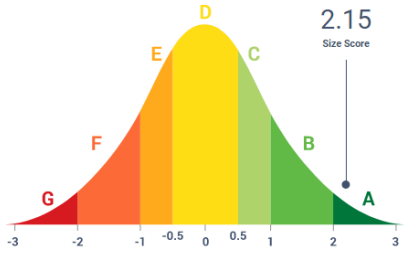
GHG Rating
A
B
C
D
E
F
G

Size Score

2.15

A vessel's size score represents where it sits within a GHG Rating band. In the peer distribution image below, the size score is displayed along the bottom of the bell curve. This vessel has a size score of 2.15, placing it in the A rating band.

The ratings are dynamic and subject to change as the peer group changes, therefore it is common for a vessel's size score and GHG Rating to slowly change over time as new vessels enter service and older vessels are scrapped.



Source: Rightship

BALTIC EXCHANGE EEOI

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Table 5 EEOI calculation data

Dry Bulk Routes (Load/Discharge)	Ballast starts from	Cargo Carried (tonnes)	Ballast mileage (nm)	Laden mileage (nm)	Ballast Knots	Laden Knots	Total CO_2 (tonne)	Total Work done (tnm)	EEOI (gCO_2/tnm) Eco Speed Full Speed
C2 - Tubarao/Rotterdam	Rotterdam	175000	5003	5003	13.0	12.0	4889	875.5	5.58
					15.0	14.0	6052		6.91
C3 - Tubarao/Qingdao	Qingdao	177000	11339	11339	13.0	12.0	10981	2007.0	5.47
					15.0	14.0	13612		6.78
C5 - Port Hedland/Qingdao	Qingdao	178000	3612	3612	13.0	12.0	3587	642.9	5.58
					15.0	14.0	4426		6.88
C7 - Bolivar/Rotterdam	Rotterdam	166000	4376	4376	13.0	12.0	4342	726.4	5.98
					15.0	14.0	5361		7.38
C8 - Bolivar/Turkey	Rotterdam	176500	4376	7968	13.0	12.0	6123	1406.4	4.35
					15.0	14.0	7562		5.38
C9 - Kamsar/Qingdao	Passero	166000	2953	11435	13.0	12.0	7177	1898.2	3.78
					15.0	14.0	8858		4.67
C10 - Port Hedland/Qingdao	Qingdao	178000	3612	3612	13.0	12.0	3587	642.9	5.58
					15.0	14.0	4426		6.88
C14 - Tubarao/Qingdao	Qingdao	177000	11339	11339	13.0	12.0	10981	2007.0	5.47
					15.0	14.0	13612		6.78
C16 - Indonesia/Mediterranean	Qingdao	178000	2488	7899	13.0	12.0	5202	1406.0	3.70
					15.0	14.0	6415		4.56
C17 - Saldanha Bay/Qingdao	Qingdao	177000	8251	8251	13.0	12.0	8041	1460.4	5.51
					15.0	14.0	9956		6.82
P1A - New Orleans/Rotterdam	Bilbao	80000	4657	4924	12.5	11.5	2572	393.9	6.53
					14.0	13.5	3181		8.07

Source: The Baltic Exchange

- Market comparison and benchmarking tool. Potentially helpful for Green COAs
- Indicative EEOI values for all of Baltic's voyage and t/c routes
- Expected to be published to the market in a way that is similar to the existing indices.
- Highlights the variability in emissions / environmental efficiency across routes and size classes.
- The Baltic should take a leading role in creating emission baselines for all sizes and routes. This is needed to truly measure real savings.

EU EMISSION TRADING SYSTEM (EU ETS)

- The EU created a market mechanism to give CO_2 a price and create incentives for reducing emissions as cost-effectively as possible.
- The shipping sector is expected to be included in the EU ETS from 2024 onwards, a phase-in period is under review.
- 100% of intra-EU Emissions; 50% of inter-EU emissions
- >5000GT expected, >400 GT possibly after 2027, with compliance with MRV reporting earlier
- Polluter Pays Principle
- Potential Phase-in approach
- All GHG, not just CO_2 are eventually expected to be taxed, proceeds may or may not flow to an innovation fund aimed at decarbonizing the shipping sector.
- Full details pending Trialogue process

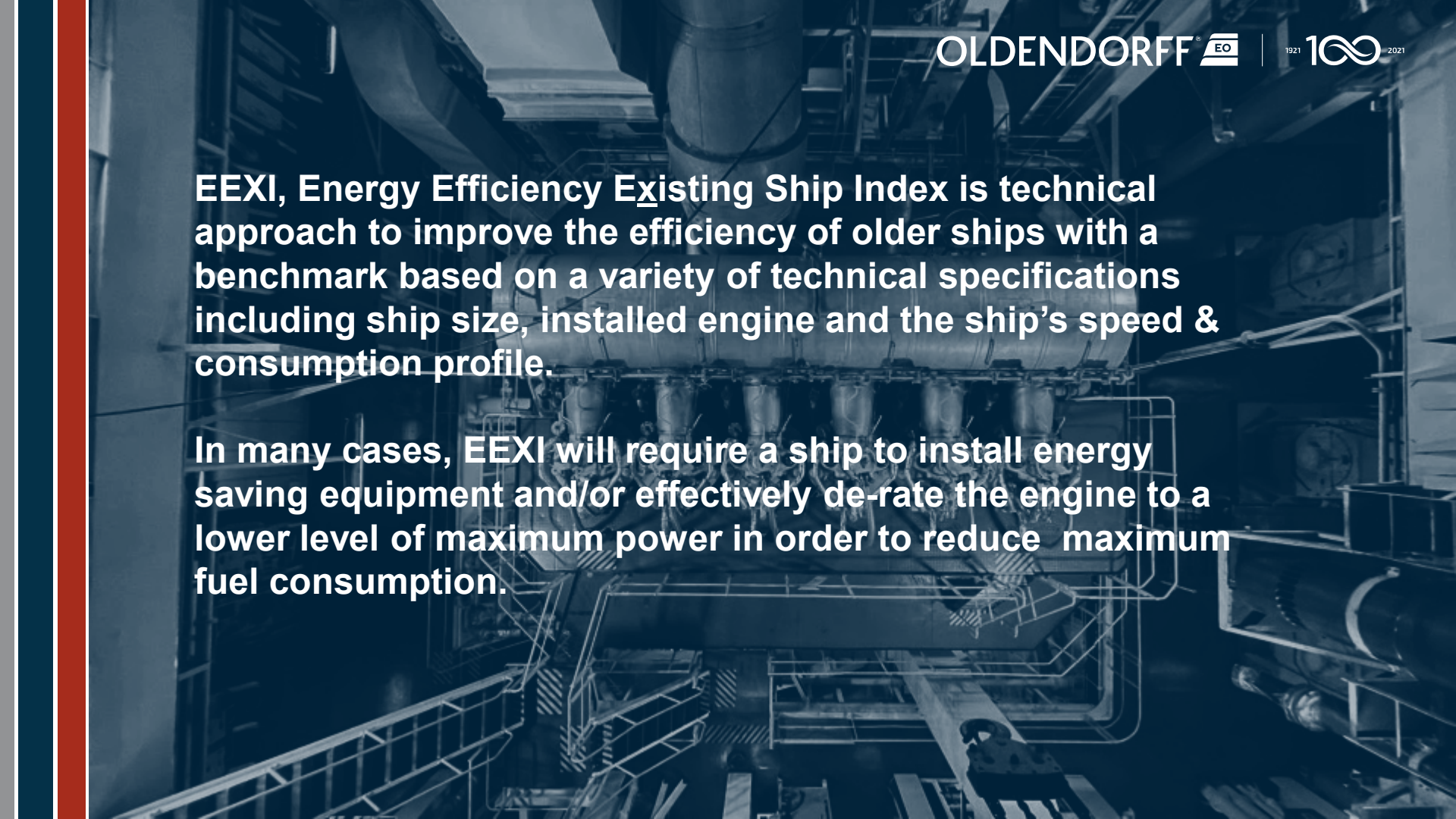
Softmar voyage reference:	2103472
Charterer:	X
Vessel:	Jan Oldendorff
DWT:	61,536
Ballast from:	Szczecin, Poland
Loaded at:	Klaipeda, Lithuania
Discharged at:	Diliskelesi LST, Turkey
IFO consumption (mts):	393.5
LSG consumption (mts):	127.8

EU ETS - Carbon Tax Calculation for this voyage basis carbon price on 25 Oct 2022 = 72 €/mt (US$ 71/mt)

US$ 3.200 for 100% taxable emissions from the ballast leg

US$ 60.500 for 50% taxable emissions from laden leg

Total voyage carbon tax liability US$ 63.700 = ~ US$ 1/mt



EEXI, Energy Efficiency Existing Ship Index is technical approach to improve the efficiency of older ships with a benchmark based on a variety of technical specifications including ship size, installed engine and the ship's speed & consumption profile.

In many cases, EEXI will require a ship to install energy saving equipment and/or effectively de-rate the engine to a lower level of maximum power in order to reduce maximum fuel consumption.

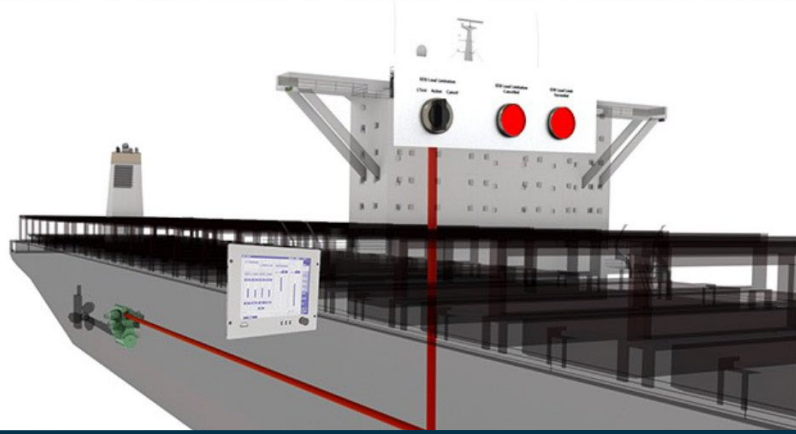
IMO EEXI REGULATION

Over-ridable Power Limiters

- MAN OPL (Over-ridable Power Limiters) for **MC engines** is a measure to limit the main engines Maximum Continuous Rating (MCR), with the possibility to be overridden if safety of the vessel is compromised (mechanical stopper device for limiting the fuel index).

- MAN OPL for **ME engines** is a solution that consists of software and hardware, where the engine power is limited electronically by installing a new software release and parameter file.

While EEXI is intended to set a new benchmark on vessel technical efficiency, it is not expected to have significant impact on overall fleet speed.



Source: MAN

TRADE ROUTE SIMULATION – SCENARIO 1A

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Iron Ore Pellets for TBN Client

Rotterdam (start ballast) > Sept Iles, Canada (loading) > Rotterdam (discharge)

Vessel	Vessel type	DWT	Intake	Ballast distance	Laden distance	Total distance	IFO (HSFO)	LSF (VLSFO)	LSG (LSMGO)	LNG
STD82	Bulk Carrier	81,750	79,750	2,746	2,746	5,492	0.00	350.39	244.32	0.00

Emissions and carbon intensity KPIs				
CO_2	CO_2/1000MT	AER	EEOI	CO_2/nm
1,874	23.5	4.175	8.559	0.341

Parcelling ?
No

EU/EEA distances sailed		
Inbound	Intra EU/EEA	Outbound
2,746	0	2,746
50%	100%	50%

Year	IMO				Sea Cargo Charter		EU ETS		
	CII ranking label (predicted)	Trajectory alignment 'mid-C' point	Trajectory alignment C/D boundary	Trajectory alignment D/E boundary	Required EEOI	Trajectory alignment	% of eligible emissions to be taxed	Estimated carbon liability (USD)	
								Total	Per ton shipped
2023	C	5.3%	-0.7%	-10.8%	6.617	29.4%			
2024	D	7.5%	1.4%	-8.9%	6.449	32.7%	40%	28,116	0.35
2025	D	9.9%	3.7%	-6.9%	6.281	36.3%	70%	49,203	0.62
2026	D	12.4%	6.0%	-4.8%	6.113	40.0%	100%	70,290	0.88

Year	IMO CII boundary values				
	A/B	B/C	mid-C	C/D	D/E
2023	3.411	3.728	3.966	4.204	4.680
2024	3.339	3.650	3.883	4.116	4.582
2025	3.267	3.571	3.799	4.027	4.483
2026	3.196	3.493	3.716	3.939	4.385

EU carbon price = 75.00 EUR

EUR = 1.00 USD

Parcelling (if any)			
From	To	Tons	Distance

Transport work:	218,993,500 ton-miles

IMPORTANT NOTES

Based on normal speed
(14,00k/31,00MT, 13,50k/33,00MT)

TRADE ROUTE SIMULATION – SCENARIO 1B

OLDENDORFF EO 1921 100 2021

Iron Ore Pellets for TBN Client

Rotterdam (start ballast) > Sept Iles, Canada (loading) > Rotterdam (discharge)

Vessel	Vessel type	DWT	Intake	Ballast distance	Laden distance	Total distance	IFO (HSFO)	LSF (VLSFO)	LSG (LSMGO)	LNG
STD82	Bulk Carrier	81,750	79,750	2,746	2,746	5,492	0.00	295.08	210.20	0.00

Emissions and carbon intensity KPIs				
CO_2	CO_2/1000MT	AER	EEOI	CO_2/nm
1,593	20.0	3.548	7.273	0.290

Parcelling ?
No

EU/EEA distances sailed		
Inbound	Intra EU/EEA	Outbound
2,746	0	2,746
50%	100%	50%

Year	IMO				Sea Cargo Charter		EU ETS		
	CII ranking label (predicted)	Trajectory alignment 'mid-C' point	Trajectory alignment C/D boundary	Trajectory alignment D/E boundary	Required EEOI	Trajectory alignment	% of eligible emissions to be taxed	Estimated carbon liability (USD)	
								Total	Per ton shipped
2023	B	-10.6%	-15.6%	-24.2%	6.617	9.9%		0	0.00
2024	B	-8.6%	-13.8%	-22.6%	6.449	12.8%	40%	23,892	0.30
2025	B	-6.6%	-11.9%	-20.9%	6.281	15.8%	70%	41,810	0.52
2026	C	-4.5%	-9.9%	-19.1%	6.113	19.0%	100%	59,729	0.75

Year	IMO CII boundary values				
	A/B	B/C	mid-C	C/D	D/E
2023	3.411	3.728	3.966	4.204	4.680
2024	3.339	3.650	3.883	4.116	4.582
2025	3.267	3.571	3.799	4.027	4.483
2026	3.196	3.493	3.716	3.939	4.385

EU carbon price = 75.00 EUR

EUR = 1.00 USD

Parcelling (if any)			
From	To	Tons	Distance

Transport work:	218,993,500 ton-miles

IMPORTANT NOTES

Based on eco speed
(12,50k/23,00MT, 12,00k/25,00MT)

TRADE ROUTE SIMULATION – SCENARIO 1C

OLDENDORFF EO 1921 100 2021

Iron Ore Pellets for TBN Client

Rotterdam (start ballast) > Sept Iles, Canada (loading) > Rotterdam (discharge)

Vessel	Vessel type	DWT	Intake	Ballast distance	Laden distance	Total distance	IFO (HSFO)	LSF (VLSFO)	LSG (LSMGO)	LNG
STD180	Bulk Carrier	180,000	176,000	2,746	2,746	5,492	0.00	652.67	492.05	0.00

Emissions and carbon intensity KPIs				
CO_2	CO_2/1000MT	AER	EEOI	CO_2/nm
3,610	20.5	3.652	7.469	0.657

Parcelling ?
No

EU/EEA distances sailed		
Inbound	Intra EU/EEA	Outbound
2,746	0	2,746
50%	100%	50%

Year	IMO				Sea Cargo Charter		EU ETS		
	CII ranking label (predicted)	Trajectory alignment 'mid-C' point	Trajectory alignment C/D boundary	Trajectory alignment D/E boundary	Required EEOI	Trajectory alignment	% of eligible emissions to be taxed	Estimated carbon liability (USD)	
								Total	Per ton shipped
2023	E	50.4%	41.9%	27.5%	4.578	63.1%		0	0.00
2024	E	53.7%	45.0%	30.2%	4.462	67.4%	40%	54,149	0.31
2025	E	57.0%	48.1%	33.1%	4.346	71.9%	70%	94,761	0.54
2026	E	60.6%	51.5%	36.1%	4.230	76.6%	100%	135,372	0.77

Year	IMO CII boundary values				
	A/B	B/C	mid-C	C/D	D/E
2023	2.088	2.282	2.428	2.573	2.865
2024	2.044	2.234	2.377	2.519	2.804
2025	2.000	2.186	2.325	2.465	2.744
2026	1.956	2.138	2.274	2.411	2.684

EU carbon price = 75.00 EUR

EUR = 1.00 USD

Parcelling (if any)			
From	To	Tons	Distance

Transport work:	483,296,000 ton-miles

IMPORTANT NOTES

Based on normal speed
(15,00k/62,00MT, 14,00k/62,00MT)

TRADE ROUTE SIMULATION – SCENARIO 1D

OLDENDORFF EO 1921 100 2021

Iron Ore Pellets for TBN Client

Rotterdam (start ballast) > Sept Iles, Canada (loading) > Rotterdam (discharge)

Vessel	Vessel type	DWT	Intake	Ballast distance	Laden distance	Total distance	IFO (HSFO)	LSF (VLSFO)	LSG (LSMGO)	LNG
STD180	Bulk Carrier	180,000	176,000	2,746	2,746	5,492	0.00	525.26	412.96	0.00

Emissions and carbon intensity KPIs				
CO_2	CO_2/1000MT	AER	EEOI	CO_2/nm
2,960	16.8	2.994	6.124	0.539

Parcelling ?
No

EU/EEA distances sailed		
Inbound	Intra EU/EEA	Outbound
2,746	0	2,746
50%	100%	50%

Year	IMO				Sea Cargo Charter		EU ETS		
	CII ranking label (predicted)	Trajectory alignment 'mid-C' point	Trajectory alignment C/D boundary	Trajectory alignment D/E boundary	Required EEOI	Trajectory alignment	% of eligible emissions to be taxed	Estimated carbon liability (USD)	
								Total	Per ton shipped
2023	E	23.3%	16.3%	4.5%	4.578	33.8%		0	0.00
2024	E	26.0%	18.8%	6.8%	4.462	37.2%	40%	44,394	0.25
2025	E	28.7%	21.5%	9.1%	4.346	40.9%	70%	77,690	0.44
2026	E	31.6%	24.2%	11.6%	4.230	44.8%	100%	110,985	0.63

Year	IMO CII boundary values				
	A/B	B/C	mid-C	C/D	D/E
2023	2.088	2.282	2.428	2.573	2.865
2024	2.044	2.234	2.377	2.519	2.804
2025	2.000	2.186	2.325	2.465	2.744
2026	1.956	2.138	2.274	2.411	2.684

EU carbon price = 75.00 EUR

EUR = 1.00 USD

Parcelling (if any)			
From	To	Tons	Distance

Transport work: 483,296,000 ton-miles

IMPORTANT NOTES

Based on eco speed

(13,00k/43,00MT, 12,00k/43,00MT)

TRADE ROUTE SIMULATION – SCENARIO 1E

OLDENDORFF EO 1921 100 2021

Iron Ore Pellets for TBN Client

Rotterdam (start ballast) > Sept Iles, Canada (loading) > Rotterdam (discharge)

Vessel	Vessel type	DWT	Intake	Ballast distance	Laden distance	Total distance	IFO (HSFO)	LSF (VLSFO)	LSG (LSMGO)	LNG
STD208	Bulk Carrier	208,000	198,000	2,746	2,746	5,492	0.00	626.68	485.44	0.00

Emissions and carbon intensity KPIs				
CO_2	CO_2/1000MT	AER	EEOI	CO_2/nm
3,508	17.7	3.071	6.452	0.639

Parcelling ?
No

EU/EEA distances sailed		
Inbound	Intra EU/EEA	Outbound
2,746	0	2,746
50%	100%	50%

Year	IMO				Sea Cargo Charter		EU ETS		
	CII ranking label (predicted)	Trajectory alignment 'mid-C' point	Trajectory alignment C/D boundary	Trajectory alignment D/E boundary	Required EEOI	Trajectory alignment	% of eligible emissions to be taxed	Estimated carbon liability (USD) Total	Estimated carbon liability (USD) Per ton shipped
2023	E	38.4%	30.6%	17.3%	4.280	50.7%		0	0.00
2024	E	41.4%	33.4%	19.8%	4.171	54.7%	40%	52,617	0.27
2025	E	44.5%	36.3%	22.4%	4.062	58.8%	70%	92,080	0.47
2026	E	47.7%	39.4%	25.2%	3.954	63.2%	100%	131,543	0.66

Year	IMO CII boundary values				
	A/B	B/C	mid-C	C/D	D/E
2023	1.908	2.086	2.219	2.352	2.618
2024	1.868	2.042	2.172	2.302	2.563
2025	1.828	1.998	2.125	2.253	2.508
2026	1.788	1.954	2.079	2.203	2.453

EU carbon price = 75.00 EUR

EUR = 1.00 USD

Parcelling (if any)			
From	To	Tons	Distance

Transport work:	543,708,000 ton-miles

IMPORTANT NOTES

Based on normal speed

(15,00k/58,00MT, 14,00k/61,00MT)

TRADE ROUTE SIMULATION – SCENARIO 1F

OLDENDORFF EO 1921 100 2021

Iron Ore Pellets for TBN Client

Rotterdam (start ballast) > Sept Iles, Canada (loading) > Rotterdam (discharge)

Vessel	Vessel type	DWT	Intake	Ballast distance	Laden distance	Total distance	IFO (HSFO)	LSF (VLSFO)	LSG (LSMGO)	LNG
STD208	Bulk Carrier	208,000	198,000	2,746	2,746	5,492	0.00	501.15	407.50	0.00

Emissions and carbon intensity KPIs				
CO_2	CO_2/1000MT	AER	EEOI	CO_2/nm
2,867	14.5	2.510	5.273	0.522

Parcelling ?
No

EU/EEA distances sailed		
Inbound	Intra EU/EEA	Outbound
2,746	0	2,746
50%	100%	50%

Year	IMO				Sea Cargo Charter		EU ETS		
	CII ranking label (predicted)	Trajectory alignment 'mid-C' point	Trajectory alignment C/D boundary	Trajectory alignment D/E boundary	Required EEOI	Trajectory alignment	% of eligible emissions to be taxed	Estimated carbon liability (USD)	
								Total	Per ton shipped
2023	D	13.1%	6.7%	-4.1%	4.280	23.2%		0	0.00
2024	D	15.5%	9.0%	-2.1%	4.171	26.4%	40%	43,005	0.22
2025	E	18.1%	11.4%	0.1%	4.062	29.8%	70%	75,259	0.38
2026	E	20.7%	13.9%	2.3%	3.954	33.4%	100%	107,513	0.54

Year	IMO CII boundary values				
	A/B	B/C	mid-C	C/D	D/E
2023	1.908	2.086	2.219	2.352	2.618
2024	1.868	2.042	2.172	2.302	2.563
2025	1.828	1.998	2.125	2.253	2.508
2026	1.788	1.954	2.079	2.203	2.453

EU carbon price = 75.00 EUR

EUR = 1.00 USD

Parcelling (if any)			
From	To	Tons	Distance

Transport work:	543,708,000 ton-miles

IMPORTANT NOTES

Based on eco speed

(13,00k/40,00MT, 12,00k/42,00MT)

TRADE ROUTE SIMULATION – SCENARIO 1G

OLDENDORFF EO 1921 100 2021

Iron Ore Pellets for TBN Client

Rotterdam (start ballast) > Sept Iles, Canada (loading) > Rotterdam (discharge)

Vessel	Vessel type	DWT	Intake	Ballast distance	Laden distance	Total distance	IFO (HSFO)	LSF (VLSFO)	LSG (LSMGO)	LNG
STD208	Bulk Carrier	208,000	198,000	2,746	2,746	5,492	0.00	451.94	376.96	0.00

Emissions and carbon intensity KPIs				
CO_2	CO_2/1000MT	AER	EEOI	CO_2/nm
2,616	13.2	2.290	4.811	0.476

Parcelling ?
No

EU/EEA distances sailed		
Inbound	Intra EU/EEA	Outbound
2,746	0	2,746
50%	100%	50%

Year	IMO				Sea Cargo Charter		EU ETS		
	CII ranking label (predicted)	Trajectory alignment 'mid-C' point	Trajectory alignment C/D boundary	Trajectory alignment D/E boundary	Required EEOI	Trajectory alignment	% of eligible emissions to be taxed	Estimated carbon liability (USD)	
								Total	Per ton shipped
2023	C	3.2%	-2.6%	-12.5%	4.280	12.4%		0	0.00
2024	C	5.4%	-0.5%	-10.7%	4.171	15.3%	40%	39,238	0.20
2025	D	7.7%	1.6%	-8.7%	4.062	18.4%	70%	68,667	0.35
2026	D	10.2%	3.9%	-6.6%	3.954	21.7%	100%	98,095	0.50

Year	IMO CII boundary values				
	A/B	B/C	mid-C	C/D	D/E
2023	1.908	2.086	2.219	2.352	2.618
2024	1.868	2.042	2.172	2.302	2.563
2025	1.828	1.998	2.125	2.253	2.508
2026	1.788	1.954	2.079	2.203	2.453

EU carbon price = 75.00 EUR

EUR = 1.00 USD

Parcelling (if any)			
From	To	Tons	Distance

Transport work:	543,708,000 ton-miles

IMPORTANT NOTES

Based on super-eco speed
(12,00k/33,00MT, 11,00k/35,00MT)

TRADE ROUTE SIMULATION – SCENARIO 2

OLDENDORFF 1921 100 2021

Urea for TBN Client

Antwerp (start ballast) > Kotka (loading) > Mundra (discharge)

Vessel	Vessel type	DWT	Intake	Ballast distance	Laden distance	Total distance	IFO (HSFO)	LSF (VLSFO)	LSG (LSMGO)	LNG
STD62	Bulk Carrier	62,500	53,900	1,254	7,462	8,716	0.00	628.00	314.00	0.00

Emissions and carbon intensity KPIs				
CO_2	CO_2/1000MT	AER	EEOI	CO_2/nm
2,962	55.0	5.438	7.365	0.340

Parcelling ?
No

EU/EEA distances sailed		
Inbound	Intra EU/EEA	Outbound
0	1,254	7,462
50%	100%	50%

Year	IMO				Sea Cargo Charter		EU ETS		
	CII ranking label (predicted)	Trajectory alignment 'mid-C' point	Trajectory alignment C/D boundary	Trajectory alignment D/E boundary	Required EEOI	Trajectory alignment	% of eligible emissions to be taxed	Estimated carbon liability (USD)	
								Total	Per ton shipped
2023	D	16.0%	9.4%	-1.7%	7.500	-1.8%	0%	0	0.00
2024	E	18.5%	11.8%	0.4%	7.309	0.8%	40%	50,827	0.94
2025	E	21.1%	14.3%	2.6%	7.119	3.5%	70%	88,947	1.65
2026	E	23.8%	16.8%	4.9%	6.929	6.3%	100%	127,068	2.36

Year	IMO CII boundary values				
	A/B	B/C	mid-C	C/D	D/E
2023	4.031	4.406	4.687	4.969	5.531
2024	3.946	4.313	4.589	4.864	5.415
2025	3.861	4.221	4.490	4.759	5.298
2026	3.776	4.128	4.391	4.655	5.182

EU carbon price = 75.00 EUR

EUR = 1.00 USD

Parcelling (if any)			
From	To	Tons	Distance

Transport work:	402,201,800 ton-miles

IMPORTANT NOTES

Based on normal speed
14.00k/27.0MT; 13.50k/28.50MT

OLDENDORFF EO

Rotterdam (start ballast) > Sept Iles, Canada (loading) > Rotterdam (discharge)

Scenario	Vessel	DWT	Intake	Total CO2	CO2 / 1000 MT Carried	Speed	CII 2023	CII 2024	CII 2025	CII 2026
1A	STD82	81.750	79.750	1.874	23,5	Normal 14,00k/31,00MT, 13,50k/33,00MT	C	D	D	D
1B	STD82	81.750	79.750	1.593	20,0	Eco 12,50k/23,00MT, 12,00k/25,00MT	B	B	B	C
1C	STD180	180.000	176.000	3.610	20,5	Normal 15,00k/62,00MT, 14,00k/62,00MT	E	E	E	E
1D	STD180	180.000	176.000	2.960	16,8	Eco 13,00k/43,00MT, 12,00k/43,00MT	E	E	E	E
1E	STD208	208.000	198.000	3.508	17,7	Normal 15,00k/58,00MT, 14,00k/61,00MT	E	E	E	E
1F	STD208	208.000	198.000	2.867	14,5	Eco 13,00k/40,00MT, 14,00k/42,00MT	D	D	E	E
1G	STD208	208.000	198.000	2.616	13,2	Super eco 12,00k/33,00MT, 11,00k/35,00MT	C	C	D	D

This summary of the previous scorecards illustrates some of the CII rating inconsistencies for the same trade on different sized ships at different speeds. Note the better ratings despite increased CO2 emissions/MT carried for the Panamax compared to the Newcastlemax carrying 150% more iron ore.

PROBLEMS WITH IMO CII

- IMO CII regulations are meant to reduce emissions but in reality, they have the opposite effect. Vessels will cause more emissions if they want to earn good CII ratings. Example:
  - STD82 theoretically loading a cargo from Hamburg to Rotterdam.
  - Originate APS (ie. No ballast leg) result: 205 mts CO_2 – EEEE rating.
  - Originate DOP Melbourne (ie. Very long ballast leg) result: 3243 mts CO_2 – AAAA rating.

- Vessels get penalized for loading cargo (higher consumption and risk for port delays). The best CII rating is obtained by slow steaming around in ballast condition all year.
  - STD82 ballasting 365 days on slow steam. 26142 mts CO_2 – AAAA rating (AER 2.92 (2023) & 3.196 (2026)).
  - STD82 trading 250 sea days full speed (60/40 L/B) 115 port days. 26142 mts CO_2 – CCCC rating.

- No enforcement.

- No penalties for non-compliance.

- No clear definition of non-compliance.

- Unfortunately, we believe that CII is a toothless tiger.

PROBLEMS WITH IMO CII

- The formula penalizes time in port.
Not logical to penalize vessels in port when they consume less fuel.
Owners are unable to pass on this risk to the clients as the damage to the CII rating can't be quantified.
This could penalize grain and fertilizer trades which are essential for global food supplies.
Port delays should be excluded from CII rating.

STD82 Vancouver/China. 30 days congestion. 3502 mts CO_2 – CCCC rating.
Steam around 30 days slow steam. 5362 mts CO_2 – AAAB rating.

Will owners decide to avoid the Panama and Suez canals ? (bulkers have low priority for canal slots).

- The formula penalizes time in bad weather
An owners' ability to avoid bad weather doesn't say anything about how emission friendly the vessel is.
Weather should be excluded from CII rating.

PROBLEMS WITH IMO CII

- The ranges between the various letter grades are very narrow so even small changes can have a big impact.

- No benefit for carrying positional cargoes. On the contrary, carrying cargoes with short ballast positions is bad for the CII rating.

- Calendar year measurement is not logical. The consequences for congestion is more significant in Dec vs Jan. CII should be a rolling rating for the last 12 months.

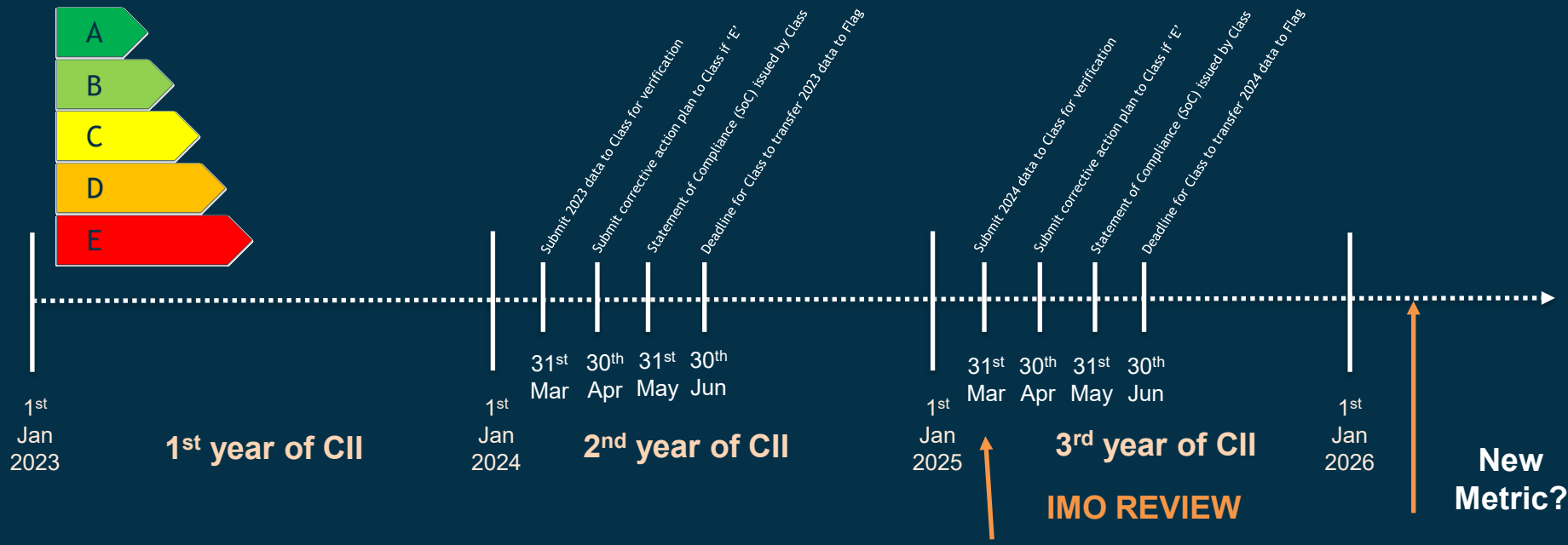
- No incentive for consistent compliance. Owners can play E/C/E.

- At the end of a calendar year, a ship that is rated D or E can simply stop trading and just ballast around to repair it's CII rating.

- If a vessel gets an E for 2023 then the problem can be deferred until Q2 2025. If you get a D then it will not be a problem until the IMO revisits and likely revises the regulations in 2026 (please see timeline on the next page).

IMO CII does not motivate good emissions behavior.

CII TIMELINE – DETAILED ANALYSIS



"A ship rated as D for three consecutive years or rated as E shall develop a plan of corrective actions to achieve the required annual operational CII."

MARPOL Annex VI, Regulation 28

This is the earliest point to be concerned, and only if the vessel scored an 'E' in 2024 basis 2023 data, and failed to improve to a 'C' rating. Flag may, at their discretion, agree that the previous years' action plan is continued to be implemented, instead of requiring a new one to be drawn up.

IMO is to review CII by 2026. Various outcomes possible, such as:

1. A new metric chosen (EEOI / EEPI / cDIST).
2. Adoption of LCA/WtW carbon factors.
3. Introduction of a fleet average CII.
4. Deemed a complete failure and scrapped!

PROBLEMS WITH IMO CII

- BIMCO was unable draft a balanced CII TC clause acceptable to both owners and charterers.
    - Burden of CII is solely with the Charterer.
    - Even if a vessel underperforms the Charterer remain responsible.
    - Owners have the right to interfere with voyage instructions.
    - Charterers have unlimited liability for expenses and risks that cannot be quantified.
    - Owners may insist that a charter operate the ship at a rating higher than what the ship is capable off.

This is not criticism of BIMCO who had the impossible task to clause poor legislation but we will not use the clause.

- Some (incl BIMCO) believe that mid C is the minimum to be compliant. This is not correct. Vessels with E are also compliant after filing corrective actions via the SEEMP.

- With the lack of enforcement some believe that the burden of enforcement should be with the voyage charterers to ask for a certain letter grade. Why ?

- Voyage charterers are struggling to incorporate CII into their business.
Vessel's rating is based on its performance during the prior calendar year.
Does it make sense for a voyage charter to insist on a certain rating during the next calendar year ?
What are voyage charterers supposed to do?

PROBLEMS WITH IMO CII

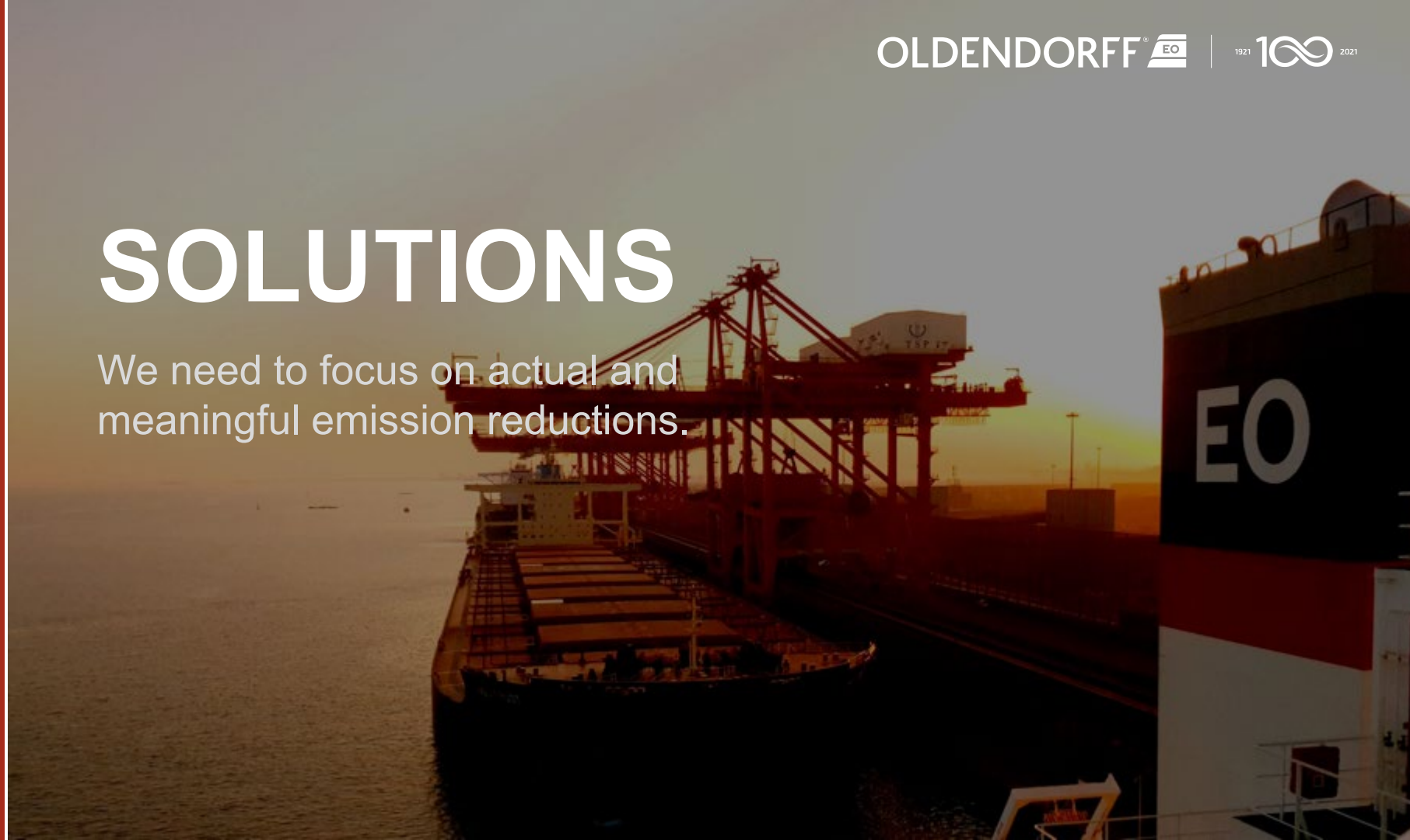
- Transshipment vessels look terrible under CII (fuel consumption but very little distance), even though they significantly reduce overall emissions through well-established economies of scale.

- Upsizing is one of the best tools for reducing emissions per metric ton carried but the formula doesn't benefit bigger ships.

- Short voyages get penalized despite emitting less as CII is overly influenced by distance.
    - STD208 coal USEC/Rotterdam APS slow steam. 1968 mts CO_2 – DDEE rating.
    - STD208 coal Aussie/Rotterdam APS slow steam. 5713 mts CO_2 – CCCC rating.

Likely result: less efficient ships on long-haul emitting more while more efficient ships stay in short trades

- Should well to wake savings should be recognized as this translates into overall emission reduction ?



SOLUTIONS

We need to focus on actual and meaningful emission reductions.

SOLUTIONS

A) For the reasons mentioned in this presentation we encourage owners and charters NOT to focus on certain IMO CII letter ratings.

- If charterers insist on a certain CII rating, then it creates a chain of events with everyone searching protection. However, there are no quantifiable damages and therefore no useable clauses.

- Worst case is that owners will then ask for indemnification from charterers for damages to the vessels CII rating caused by long port stays.
- Similarly, owners should not worry about how their ships are traded if they are out on TC.
- If owners and charterers defuse the CII requirement then the wording of an industry accepted CII clause can look completely different. There are already clauses being fixed based on this understanding.

BIMCO is drafting a TCT and voyage clause. We find this challenging, especially if the TC Clause is used as the basis. Currently, there is no demand for this in the market, so we question if such clauses will be accepted.

- Instead we encourage everyone to use their energy to focus on obtaining actual emissions savings.

- Remember D and E ratings are compliant ratings during the current phase of the IMO CII regulations (i.e. SEEMP).

B) Focus on building the most modern eco ships. EEXI/DI is can be used but needs to be looked at in more detail. Competition for more efficient vessels will lead to premiums, thus encouraging owners to modernize their vessels.

C) New technologies (significant savings are not available with today's technology).
- New alternative fuels which will have to be developed in a larger scale.
- New technical solutions (paint, hull form, sails etc).

We support Green Corridors involving everyone in the supply chain to ensure investment in new technology and fuels.

D) Continue to optimize how ships are traded.
- Upsize (economies of scale).
- Slow steam.
- Better weather routing.
- Just In Time.
- Short voyages when possible.
- More awareness of savings fuel in general.

E) Engage with IMO to come up with a better matrix for the future (that works across all segments - not just drybulk).

Cargoes will continue to move regardless of emissions regulations so the goal should be to carry the cargoes in the most efficient manner measured by CO2/pmt of cargo carried. This will encourage the right behavior.

Clarify what compliance really means, ensure proper policing of the rules and strict penalties.

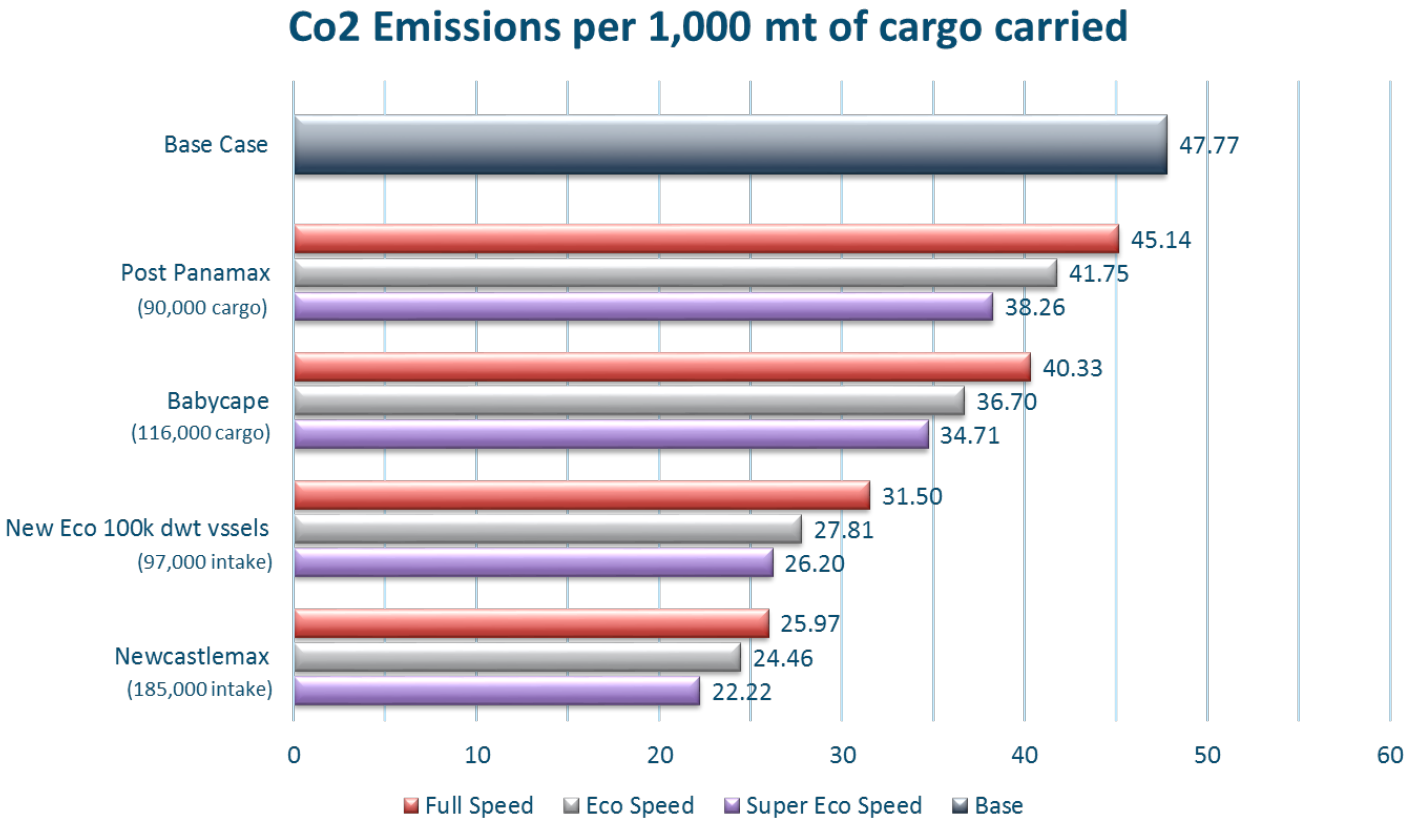
F) ETS, Bunker Levy and other Market Based Measures

The EU ETS and similar concepts including a Bunker Levy that is under discussion at the IMO will tax carbon emissions. Their objective is to use market forces to accelerate decarbonization.

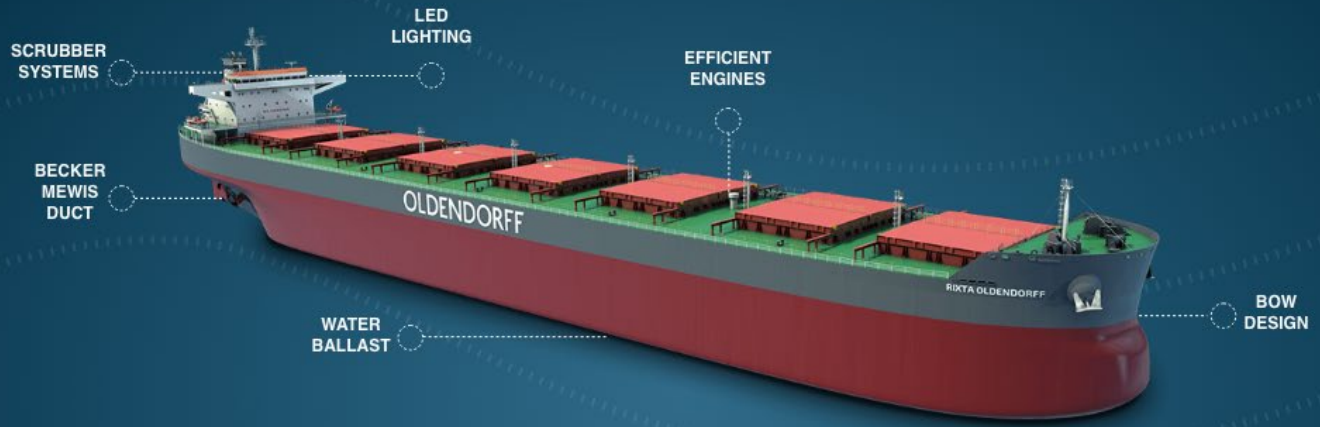
- Making carbon more expensive via a tax creates incentive to invest in lower carbon solutions.

- For this to work as intended, we believe:
  - It must be a global solution, not a regional one.
  - The “polluter pays” principle should be maintained so the expense passes through the supply chain
  - For shipping, a levy (fixed fee or tax) is better than a tradeable CO2 certificate, because:
    - The price is transparent
    - A levy is easy to understand
    - The liability is easier to pass through the counter-parties to the end users
    - A levy can be effectively claused
    - Levy enforcement and penalties are easy to manage.

EFFECT OF UPSIZING AND SPEED REDUCTION



OUR ECO FLEET



OPTIMIZED HULL DESIGNS

The spoon bow of our new Newcastlemax bulk carriers is designed to optimize the flow of water around the bow and provide optimal cargo on draft characteristics.

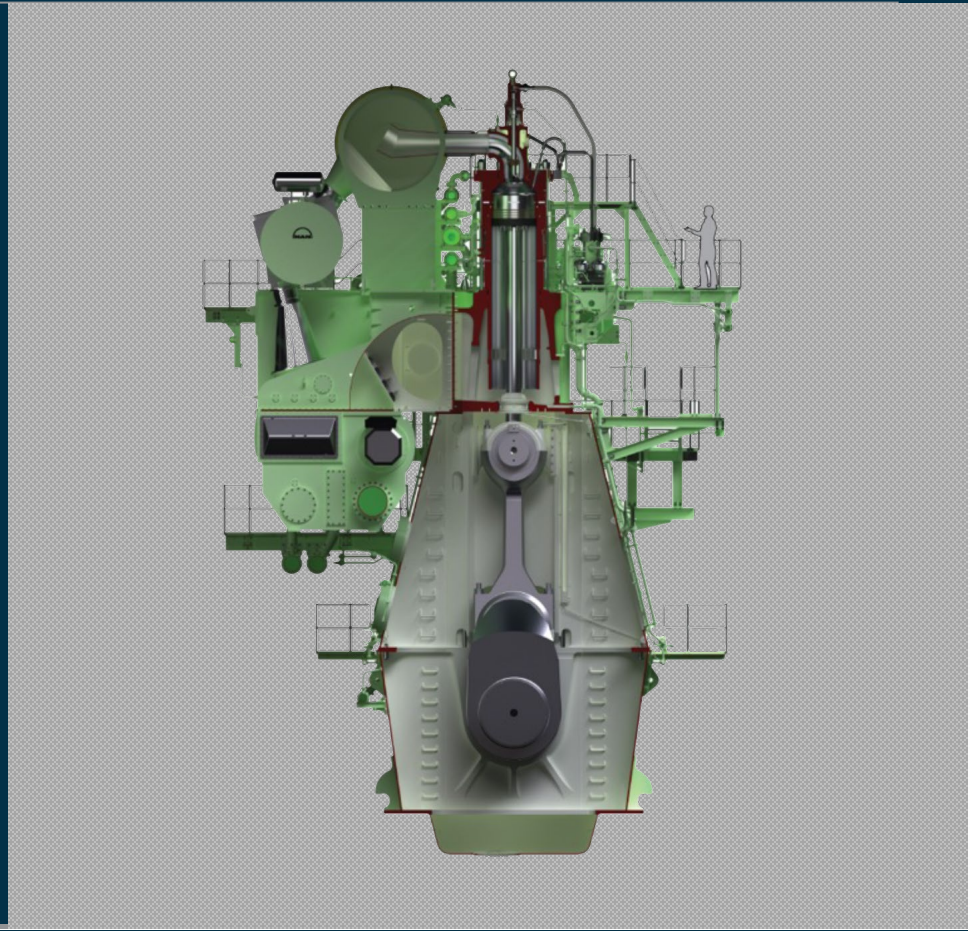
The Becker Mewis Duct and the rudder bulb are power-saving devices providing fuel savings and reduction of greenhouse gas emissions. The Mewis Duct enhances the flow of water to the propeller to increase thrust. The rudder bulb is an additional power saving device which changes the hub vortex to streamline the water flow behind the propeller.

These two “eco features” produce a fuel savings of 5-8%.

MAXIMUM POWER EFFICIENCY

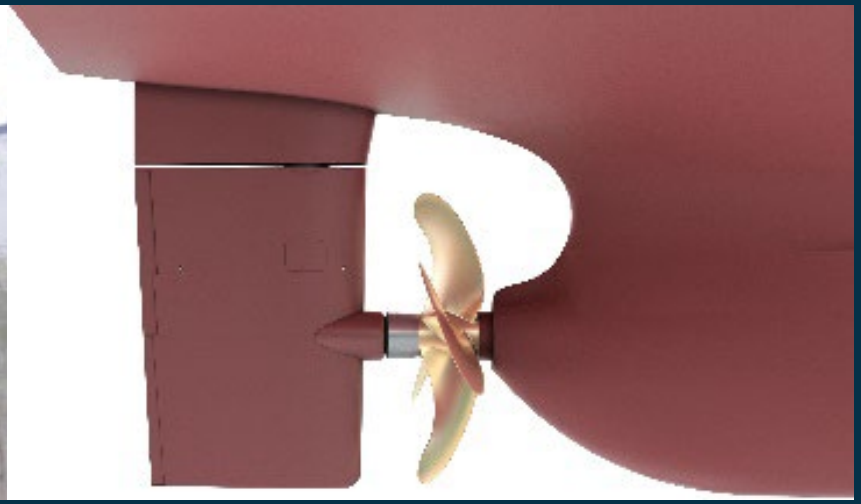
Maximum power efficiency is obtained on our Eco-Newcastlemaxes by using a Mark 9 MAN Diesel & Turbo G-type main engine with an ultra-long stroke. The ultra-long stroke results in lower engine speed and a lower rpm which allows the use of a larger propeller. The larger propeller is significantly more efficient in terms of propulsion which reduces fuel consumption and CO_2 emissions.

These vessels are also equipped with auxiliary engine economizers, designed to re-capture waste heat from the auxiliary engines.



Hydrodynamic improvement measures

Mewis Duct + Rudder Bulb



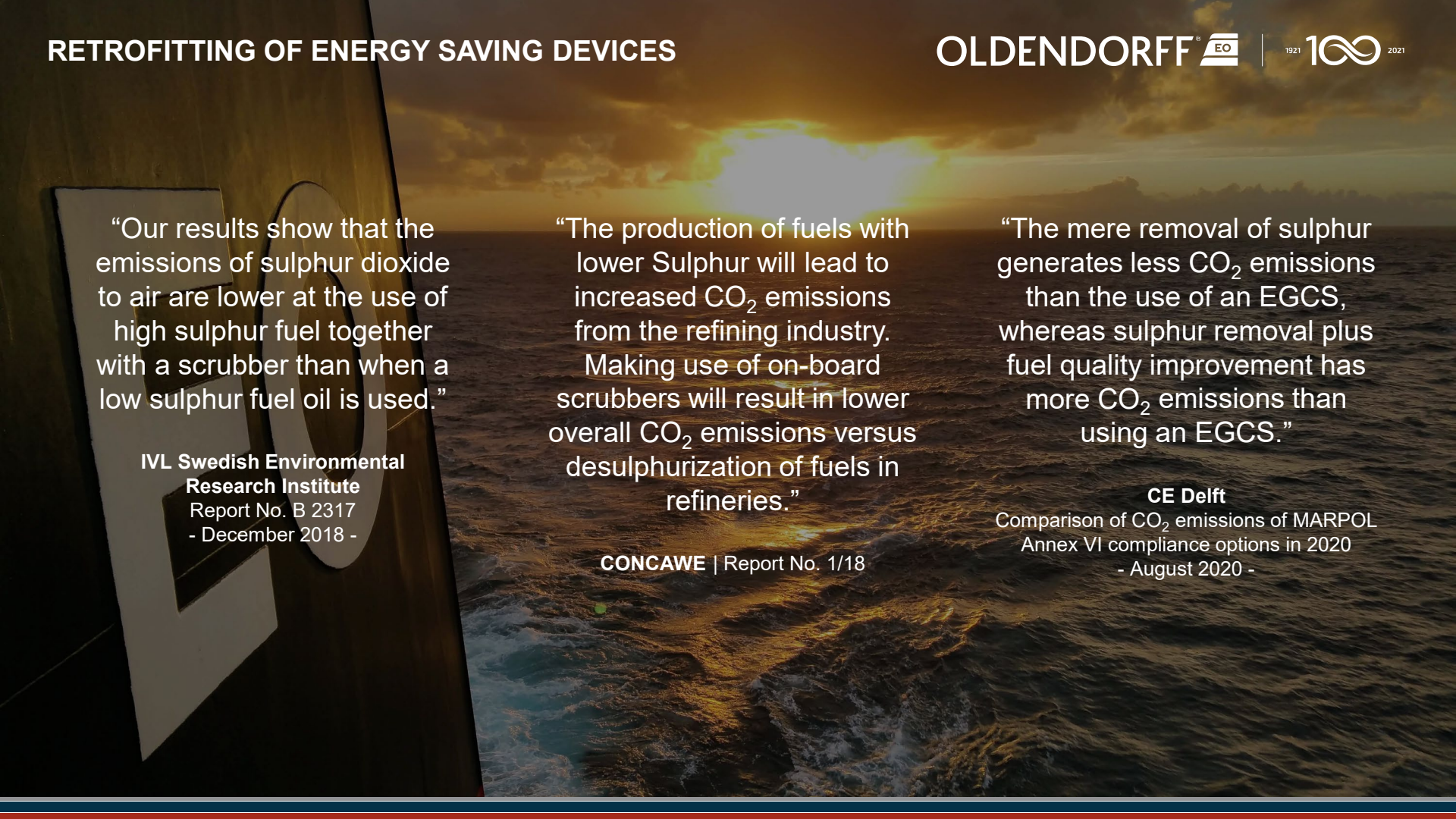
Well known and proven ESDs Fuel Savings: 5 % Speed increase: 0.4 kn

RETROFITTING OF ENERGY SAVING DEVICES

- Between 2018-2019 we made a significant investment in exhaust gas cleaning systems (EGCS/scrubbers) in order to prepare our vessels for strict international sulphur emission regulations that were coming into force on 1st January 2020. The alternative would have been to operate the vessels on MGO or LSFO.
- The decision for EGCS was made after conducting a thorough evaluation of all feasible alternatives, with fuel availability and lifecycle emission credentials being our chief concerns at the time.
- We believe our decision was the right one as it has been proven by independent research[1] that operating a vessel on HSFO in combination with an EGCS can capture and remove:
  - **more than 90% of Sulphur Oxides (SOx) ✓**
  - **60-90% of Particulate Matter (PM) ✓**
  - **up to 60% of Black Carbon (BC) ✓**
- Independent studies have also concluded lifecycle emission reduction of CO_2 from the use of EGCS. On a voyage basis, a vessel operating on HSFO in combination with an EGCS will generate significantly less carbon dioxide and other greenhouse gas emissions, than a vessel running on either VLSFO or MGO without an EGCS.

RETROFITTING OF ENERGY SAVING DEVICES

OLDENDORFF 1921 100 2021



"Our results show that the emissions of sulphur dioxide to air are lower at the use of high sulphur fuel together with a scrubber than when a low sulphur fuel oil is used."

IVL Swedish Environmental Research Institute
Report No. B 2317
- December 2018 -

"The production of fuels with lower Sulphur will lead to increased CO_2 emissions from the refining industry. Making use of on-board scrubbers will result in lower overall CO_2 emissions versus desulphurization of fuels in refineries."

CONCAWE | Report No. 1/18

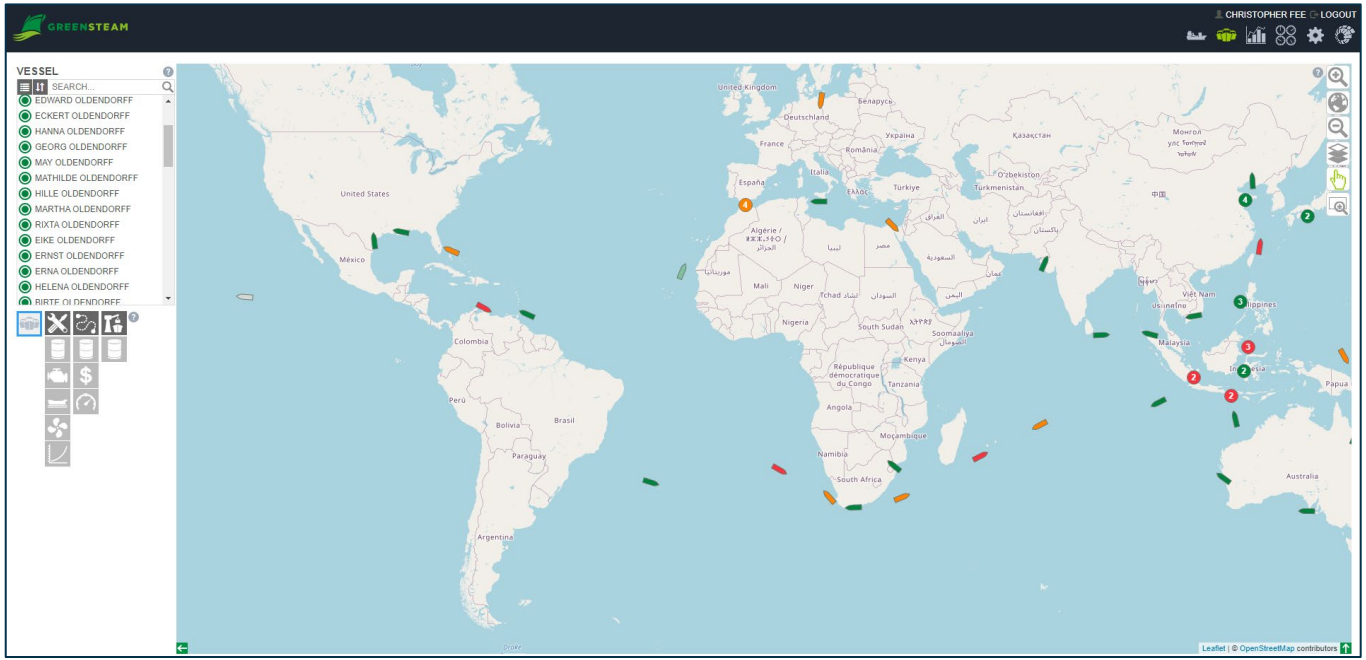
"The mere removal of sulphur generates less CO_2 emissions than the use of an EGCS, whereas sulphur removal plus fuel quality improvement has more CO_2 emissions than using an EGCS."

CE Delft
Comparison of CO_2 emissions of MARPOL Annex VI compliance options in 2020
- August 2020 -

FLEET PERFORMANCE MONITORING

The majority of our owned vessels are equipped with performance monitoring systems from GREENSTEAM.

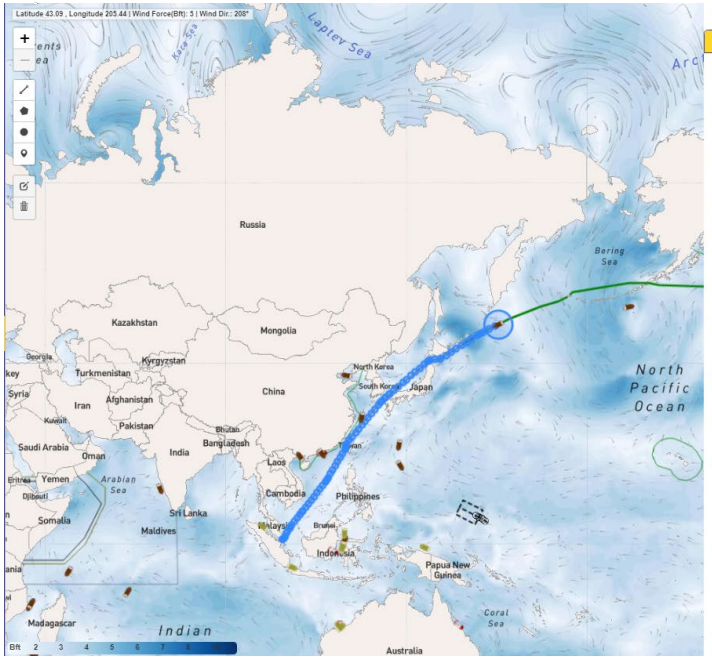
This equipment allows us to track the performance of our vessels in real-time. Using the power of this big data in combination with advanced weather routing gives us a deeper insight into vessel performance and enables us to optimize each voyage, thereby decreasing fuel consumption, mitigating emissions and reducing costs.

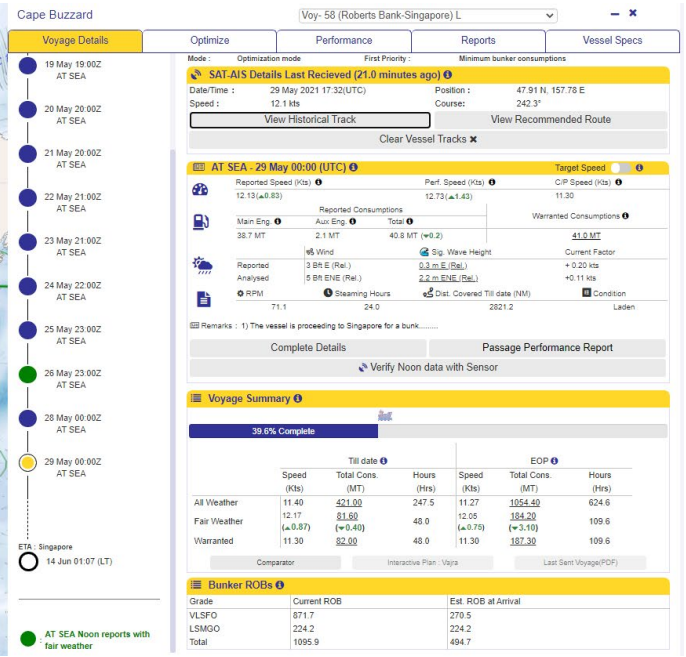


FLEET PERFORMANCE MONITORING

- Hardware agonistic system; implemented easily on any time chartered vessel.
- Utilizing big data and machine learning techniques, BOSS generates optimal voyage plan by AI driven simulations
- Ensures minimum bunker consumption / CO2 emissions within the given voyage constraints.
- Fuel savings of about 3.5% basis our experience

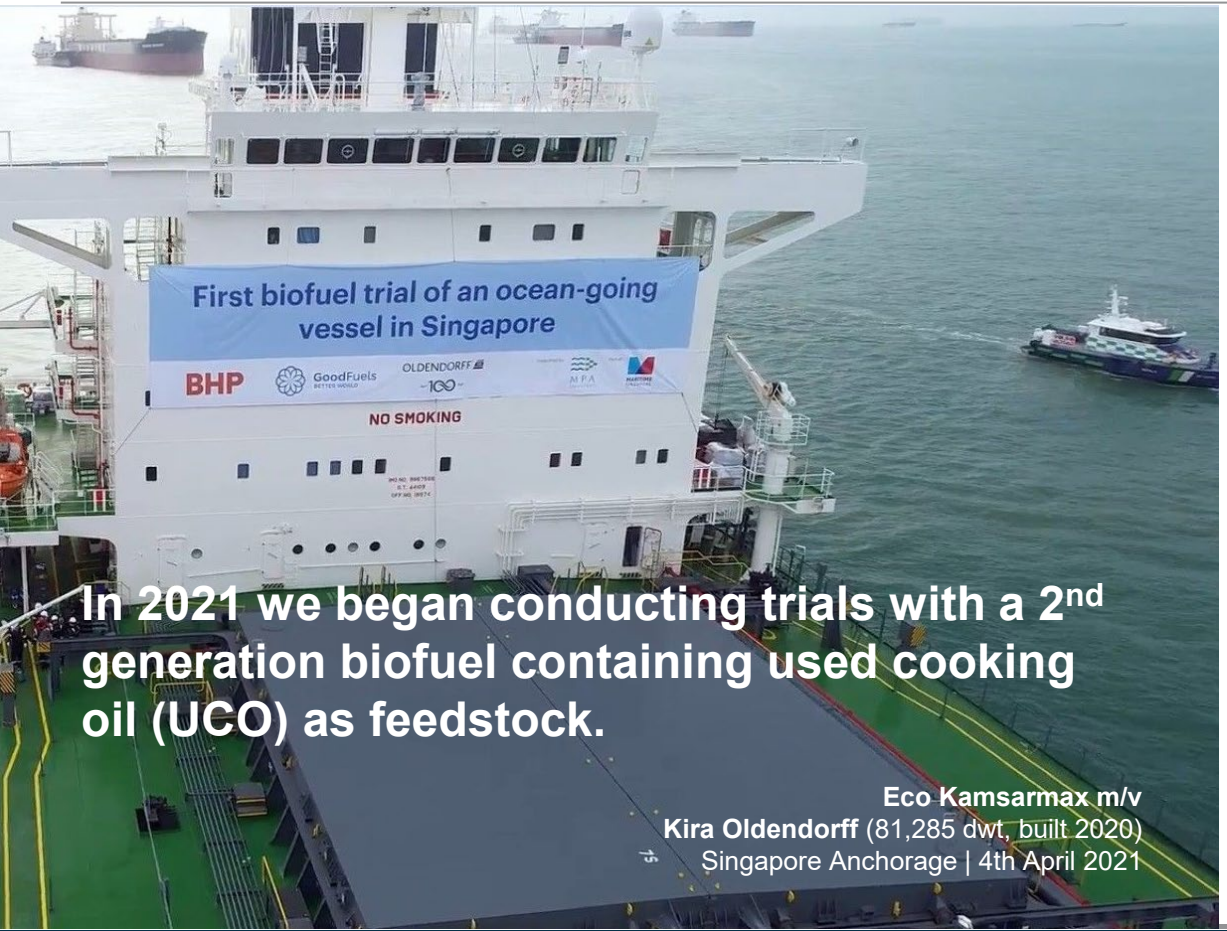
Blue Water Optimum Speed Services





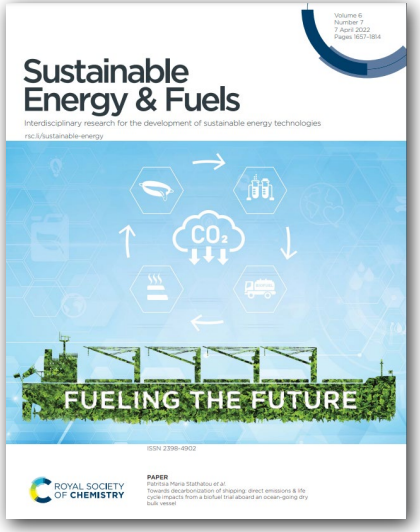
NEXT-GENERATION BIOFUELS

OLDENDORFF 1921 100 2021



In 2021 we began conducting trials with a 2nd generation biofuel containing used cooking oil (UCO) as feedstock.

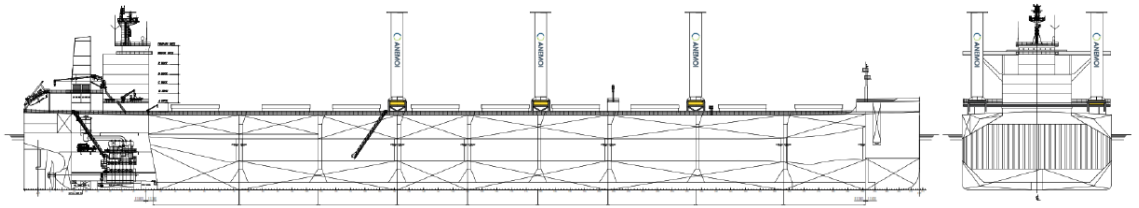
Eco Kamsarmax m/v
Kira Oldendorff (81,285 dwt, built 2020)
Singapore Anchorage | 4th April 2021



THE CENTER FOR BITS AND ATOMS
Massachusetts Institute of Technology

FLETTNER ROTORS

- Oldendorff participated in a Flettner JDP with Anemoi, SDARI and Lloyds Register;
- Harnessing the power of the wind to help reduce emissions and lower fuel consumption;
- Flexible, sturdy and reliable design to ensure no obstructions in port and minimal additional work for our crew.

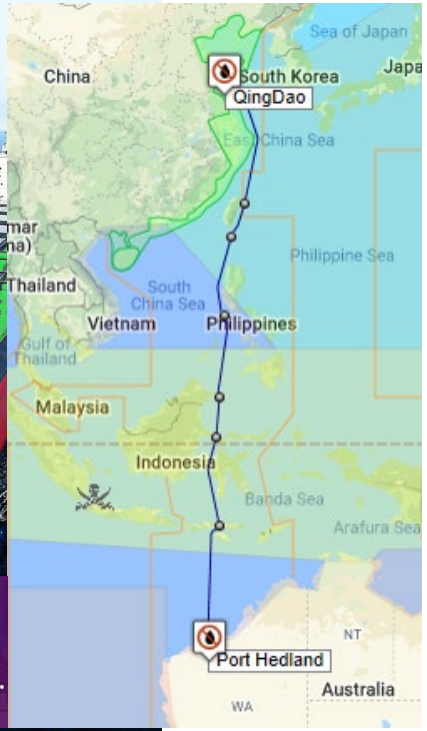


OLDENDORFF EO 1921 100 2021

AN IMPORTANT STEP TOWARDS| MARITIME DECARBONIZATION:

Maritime industry joins forces with leading global miners in support of Australia-East Asia iron ore Green Corridor.

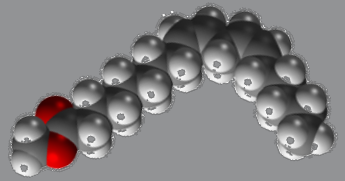
CLYDEBANK DECLARATION



RioTinto STAR BULK OLDENDORFF EO BHP GLOBAL MARITIME FORUM

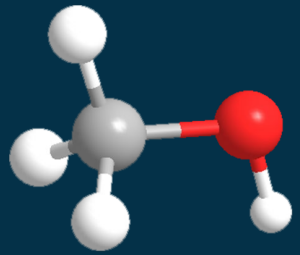
REDUCING EMISSIONS - ALTERNATIVE FUELS

BIOFUEL



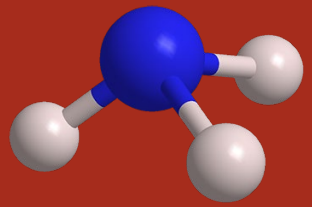
- Available only at main hubs
- CO_2 savings up to 80% versus LSMGO
- Certification of CO_2 savings not standardised
- Storage life in tank uncertain
- Subsidised in The Netherlands
- Not a CII solution

METHANOL



- Requires around 5% pilot fuel to ignite
- Liquid at ambient temperatures
- Safe handling procedures in place
- Biodegradable and not a marine pollutant
- Renewable net zero production pathway possible
- Methanol bunkering is at early stage

AMMONIA



Requires around 10% pilot fuel to ignite
Liquifies at a temperature below -33 °C
Safety standards and regulation under development
Ammonia powered ship engines under development
Renewable net zero production pathway possible
Ammonia as a bunkering fuel is in pilot testing stage

NEXT STEPS?

The presentation “CII is not the answer” is an informal educational document published by Oldendorff Carriers GmbH & Co. KG. It aims to inform Oldendorff employees and other interested shipping professionals about various aspects of new regulations including but not limited to the so-called CII regulations enacted by the IMO. Materials prepared by Oldendorff Carriers personnel are based on public information. The information herein (other than disclosure information relating to Oldendorff and its affiliated) was obtained from various sources and we do not guarantee its accuracy. All opinions, projections and estimates constitute the judgment of the author as of the date of the report and are subject to change without notice.

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