

GREEN
TECH
SOLUTION

*n*JØRD



TECHNOLOGY
SCREENING

BORE SEA
IMO NUMBER 9443554
AUGUST 2025

EXECUTIVE SUMMARY

Njord has completed a Technology Screening for vessel Bore Sea. Below are the key findings.

KEY FINDINGS

7

Number of techs.
found relevant

13.5

Savings potential in %

1.11

Return on Investment
in Years

675,000

Total Investment in USD

607,483

Yearly Bunker Savings in USD



NJORD SCORE

Njord Score	A	B	C	D	E
Remaining Savings Potential	< 3%	< 6%	< 9%	< 12%	+ 12%

The Njord Score of vessel BORE SEA is E.

The score given is based on how much the vessel can improve its efficiency through the application of a combined Energy Savings Technology package, that does not supersede 2.5 years ROI.

7

Number of techs.
found commercially
viable

13.5

Savings potential
in %

1.11

ROI in
years

E

Benchmark
score

The figures above highlight the total number of commercially viable technologies yet to be explored, their combined savings impact and ROI. The benchmark Njord Score reflects how similar vessels, which Njord has worked on, are currently rated.

READ MORE ABOUT THE
NJORD SCORE HERE





1	EXECUTIVE SUMMARY	2
2	NJORD SCORE	3
3	GENERAL INFORMATION	5
4	VESSEL PARTICULARS	6
5	BUSINESS CASE	8
6	REGULATORY IMPACT	9
7	BASIC TECHNOLOGIES	12
8	NEXT STEP - NJORD'S SOLUTION DESIGN	14



GENERAL INFORMATION

METHODOLOGY

This Technology Screening is based on Njord's experience of +500 vessel assessments and +200 Energy Efficiency Technologies (EETs) installations. For BORE SEA, Njord has utilized insights from work completed on similar vessels in terms of segment, size, and trading patterns. To avoid overlapping savings when applying multiple technologies, all technologies are prioritized based on impact. For example, if Technology X (priority 1) has a 10% individual impact and Technology Y (priority 2) has a 5% individual impact, Y's effect is calculated on the remaining 90% of fuel consumption. This approach ensures accuracy when applying multiple EETs and the avoidance of counting savings twice. Novel technologies have been considered for the vessel in a separate appendix.

ASSUMPTIONS

The Technology Screening is based on data provided by Spliethoff's Bevrachtingskantoor B.V. to Njord. Equipment and installation prices are based on

average figures from recent projects, and includes all-in costs (equipment, logistics, and installation). Final prices will depend on the specific project, volume, and negotiations.

The saving potential is divided across two technology categories:

Direct Savings Technologies (DS) directly impact vessel performance post-installation and may influence EEXI.

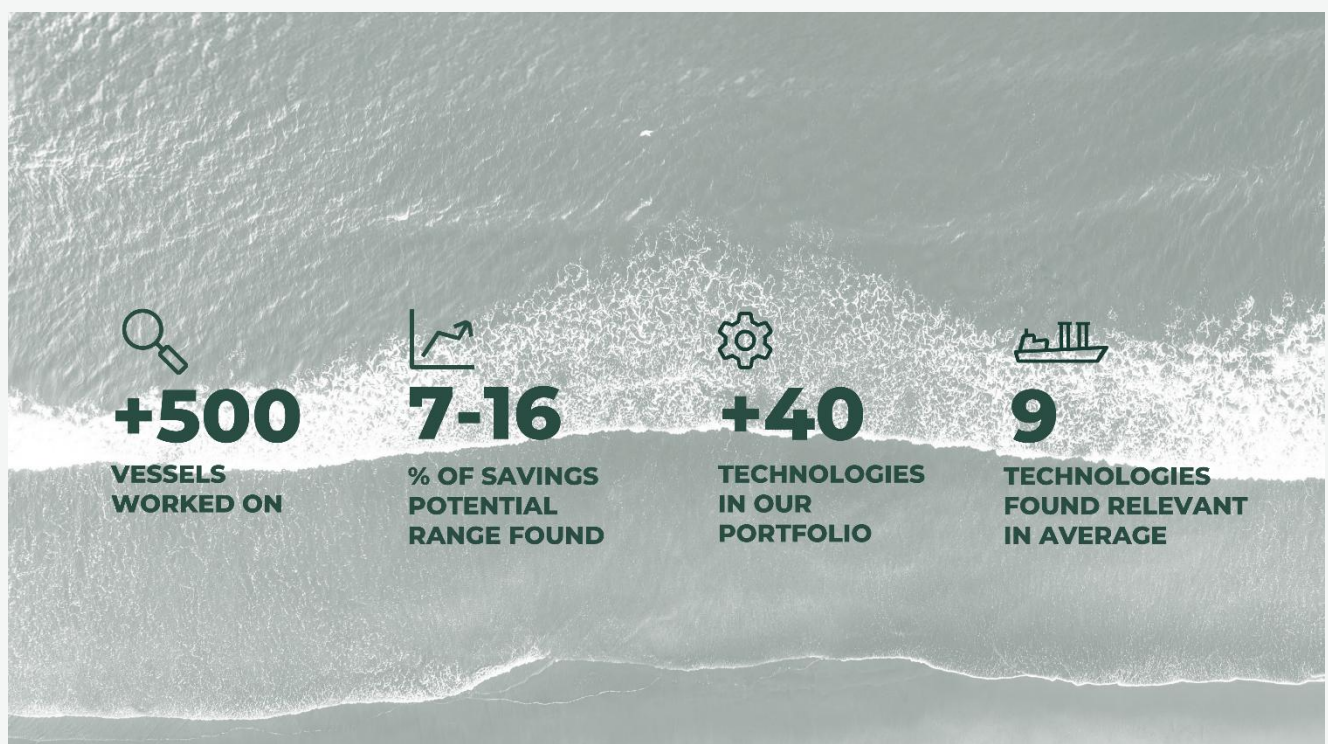
Enabled Savings Technologies (ES) improve technical and/or operational efficiency.

The following bunker prices have been considered for the cost calculation:

HFO – 406 USD/MT

MGO – 652 USD/MT

EU Carbon Price – 82.00 USD/MT



VESSEL PARTICULARS

General Information of Vessel

Vessel Name	Bore Sea
IMO Number	9443554
Vessel Owner	Spliethoff's Bevrachtingkantoor BV
Commercial Manager	Bore Oy AB (Bore Limited)
Technical Manager	Bore Shipowners BV
Vessel Type	roll on roll off with container capacity
Build Year	2011
Flag	NLD
Classification Society	LR
Gross Tonnage	25586
Dead Weight	13375
Next Drydock Scheduled Date	Feb-2026

Machinery Details	
Main Engine: Type and Make	Wartsila Corporation (Diesel)
Main Engine: No. of Engines	1
Main Engine: Max Power	12000
Main Engine: Max RPM	600
Main Engine: Power Limitations	CSR 100% = 12MW (de-rated from 15,6 MW)
Auxiliary Engine: Type and Make	MITSUBISHI HEAVY INDUSTRIES, LTD. S12R-MPTAW
Auxiliary Engine: No. of Engines	2
Auxiliary Engine: Max Power	1270
Boiler: Type and Make	Aalborg Industries B.v. (Alfa Laval). Wiesloch, thermal fluid heater
Boiler: Capacity	1750 kW
Hull: Antifouling Paint Specification and Paint Name	N/A
Ballast Water Treatment System. Make and model	Hyde Marine, HG5A USCG
Loading Computer. Make and model	Napa, Onboard Napa
Scrubber/EGCS? If yes, Make, Model and Type (Open or Closed Loop)	Yes, Lanh Tech "100SC1" open loop - hybrid ready

Consumption	
Annual Main Engine Consumption	9500 HFO / 400 LSMGO
Annual Auxiliary Engines Consumption	510 LSMGO
Annual Boiler Consumption	150 LSMGO
Annual "Other" Consumption	N/A



Operation Profile	
No. of Days Ballast in 1 year	N/A
No. of Days Laden in 1 year	238
No. of Days Idle/Load port in 1 year	127
No. of Days discharging in 1 year	N/A
General trade route of the vessel (voyages and ports/topography)	Liner traffic in Baltic Sea
Total Annual Distance (365 days)	94 000 nm

Existing Energy saving devices and Equipment	
Main Engine	Shaft generator with VFD
Hull	N/A
Auxiliary Engines	LED retrofit started, frequency drives
Boiler	Economizer
Others	Common rail ME fuel system.
Voyage Planning	N/A (trialed unsuccessfully due to liner traffic)
Is Auto Logging available on the vessel?	Yes, Manta Fleet analytics
Are Mass Flow Meters installed? If yes, which are the consumers?	Yes. ME, AE and boiler
Is BWTS Installed? if yes, type and capacity	Yes, Hyde Marine Guardian system, Type HG700G, 700m3/h
Is the vessels installed with a scrubber? if yes, please specify Open Loop / Closed Loop	Yes, Open loop.
Which consumers are covered by the scrubber? example ME, Auxiliary Engines, Boiler	ME
kWHr meter available?	Yes
Shaft Power Meter available?	Yes
Economisers (EGB) fitted on AEs and ME?	ME only
Are VFDs installed? If YES, which all equipment are covered?	Yes, Main SW pump, scrubber SW supply pump, scrubber booster pump
Other Machinery Details where ESDs applicable (e.g. Cargo plant for Gas Carriers)	NA
Make and Model of Loading software onboard	Napa, onboard Napa

Any other information	
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BUSINESS CASE

ANNUAL SAVINGS POTENTIAL OF THE TECHNOLOGIES CONSIDERED

Savings potential

13.5%

MT CO₂ per year savings

4,464

MT Fuel savings

1,430

Main Engine

1,377

Aux Engine

49

Other

4

A total of 7 technologies have been used out of which 3 are of direct saving category and 4 are enabled savings.

One technologies will have impact on EEXI value, and 7 technologies will have impact on CII ratings

FINANCIALS FOR THE TECHNOLOGIES CONSIDERED

Return of investment (years)

1.11

Total investment USD

675,000

Yearly bunker savings USD

607,483

Bunker prices, as mentioned in the assumption section of this report, has been considered for calculation of yearly bunker savings and return on investment.



REGULATORY IMPACT

EU-ETS IMPACT

Return Of Investment (Years)

0.69

Total investment USD

675,000

Yearly bunker savings of USD

607,483

The vessel is found to be trading 100% in the EU region. We have considered for reference assuming 100% of the vessel trades in the EU region.

Estimated savings from EU ETS CO₂ for the years:

- 2026 (100%)

The carbon credits price is taken as 82.00 USD/ CO₂-MT

366,071 USD

The amended return on investment stated above takes into consideration the amount of EU carbon tax saved by applying the technologies suggested over 1 years only. Any additional EU trading beyond this point will improve the business case further.



FUELEU MARITIME IMPACT

Existing penalty – 659,450 \$
Penalty post ESD – 570,424 \$
Savings – 89,026 \$

Return Of Investment (Years)

0.64

Total investment USD

675,000

Yearly bunker savings of USD

607,483

For reference, we assumed that 100% of the vessel trades were in the EU region.

Total savings towards FuelEU:

89,026 USD

The amended return on investment stated above takes into consideration the amount of FuelEU Penalty savings and the EU carbon tax saved by applying the technologies suggested over one year only. Any additional EU trading beyond this point will improve the business case further.

The FuelEU maritime regulation sets the limit on the GHG intensity of energy used on board in the EU and imposes a penalty if a vessel's GHG intensity goes beyond the prescribed limit. Thus, the regulation promotes the use of shore power, certified renewable, and low-carbon fuels without recommending any particular type of fuel.

In addition, there is a specific reward factor for wind-assisted propulsion, which can be studied at the solution design stage.



CII IMPACT







Year	2025	2026	2027	2028	2029	2030
Required CII	15.51	15.17	14.72	14.28	13.83	13.38
CII Rating	A	A	A	A	A	A
Corrected Rating- NJORD ESD	A	A	A	A	A	A

1. Annual Efficiency Ratio (AER) and CII Ratings are calculated on basis of submitted IMO DCS data for the year 2024 and as per MEPC. 78
2. * The CII Calculation is without Correction factors for electrical consumption of cargo heating as per MEPC.355(78)
3. Operational profile of vessel for the following years is assumed to be same as 2024 and after adoption of Njord EET the Deadweight remains unchanged.
4. After applying the suggested Njord EET package, it remains in 'A' till 2030 from the current rating.




BASIC TECHNOLOGIES

*The savings ranges stated in this table showcases how technologies will perform on respective machinery (Main Engine/Auxiliary Engine/Boiler) if installed individually.

Technology		Description	Savings Category	Regulatory Impact EEXI/CII	Install in Drydock / Service	Savings Range %	Cost Range (USD)
	Flow Stream Duct	A pre-swirl hydrodynamic device to improve the flow into the propeller by creating a swirl in the opposite direction of the propeller's rotation, the device helps to straighten the wake and reduce rotational losses.	DS	CII and EEXI	Drydock	2.5 - 3.5	200K-250K
	Main Engine Lube Oil Fine Filters	Filtering engine oil instead of purification in a separator saves on separator running costs and lube oil replenishing intervals and eases the operation.	ES	CII	Both	0.2-0.8	35K-40K
	RPM & PITCH Optimisation	RPM and Pitch Optimization systems adjust engine speed and propeller pitch in real time using optimized combinator curves. This helps maintain consistent power and speed throughout a voyage, improving fuel efficiency and overall propulsion performance.	ES	CII	Both	5.0 - 8.0	150K-200K
	Auto Pilot Upgrade	Updated autopilot includes unique algorithms that ensure highly precise steering performance where it is needed, even at low speed	ES	CII	Both	1.0 -2.0	25-30k
	Propeller Fouling Protection - Ultrasound for Propeller	Ultrasonic propeller antifouling system. This device emits ultrasonic waves through the shaft to prevent marine growth on the propeller blades. As it's a preventive system, installation must begin with a clean propeller surface.	DS	CII	Both	0.5-1.0	25K-35K
	Auxiliary Engine Lube Oil Fine Filters	Filtering of engine oil instead of purification in a separator. This saves on separator running costs and lube oil replenishing intervals and eases the operation.	ES	CII	Both	0.4-1.0	40K-50K



Technology		Description	Savings Category	Regulatory Impact EEXI/CII	Install in Drydock / Service	Savings Range %	Cost Range (USD)
	Variable Frequency Drives	Variable frequency drives enable capacity control of pumps and fans, instead of on/off operation. These drives operate autonomously by sensing the running parameters of the engine and system load.	DS	CII	Both	1.2-2.0	100K-160K



NEXT STEP - NJORD'S SOLUTION DESIGN

Get a detailed verification of each technology in scope, and have a tailor-made installation guide, ready to execute.

NJORD'S SOLUTION DESIGN INCLUDES THE FOLLOWING:

- Confirmation of consumption profiles
- Confirmation of fuel savings per technology
- EEXI and CII impact analysis per technology
- Alignment and retrieval of CFD calculations from suppliers (if required, at cost)
- Recommendations for which supplier to choose per technology
- Determination of cost per technology (including and split in logistics, equipment, and installation costs)
- Performance studies for selected relevant technologies

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SOLUTION DESIGN HERE**

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**DETAILED ANALYSIS OF
EVERY TECHNOLOGY AND
HOW IT AFFECTS**



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