



TECHNOLOGY SCREENING

SINGELGRACHT
IMO NUMBER 9197375
SEPTEMBER 2025

EXECUTIVE SUMMARY

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

KEY FINDINGS

7

Number of techs.
found relevant

12.8

Savings potential in %

1.84

Return on Investment
in Years

774,500

Total Investment in USD

421,881

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 the vessel SINGELGRACHT 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	12.8	1.84	D
Number of techs. found commercially viable	Savings potential in %	ROI in years	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





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GENERAL INFORMATION

METHODOLOGY

This Technology Screening is based on Njord's experience of +500 vessel assessments and +200 Energy Efficiency Technologies (EETs) installations. For SINGELGRACHT, 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 are discussed separately and not included in the report.

ASSUMPTIONS

The Technology Screening is based on data provided by Spliethoff's Bevrachtungskantoor 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.

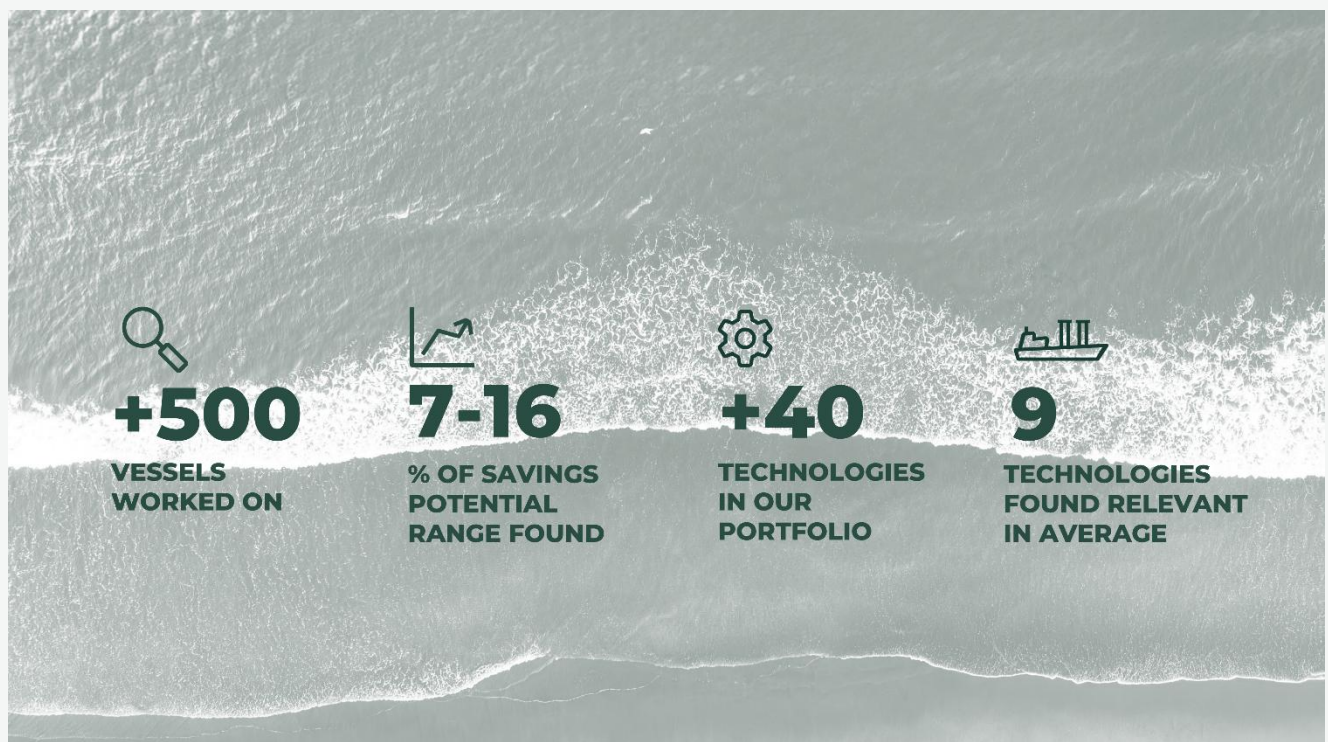
Enabled Savings Technologies (ES) improve technical and/or operational efficiency.

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	Singelgracht
IMO Number	9197375
Vessel Owner	Spliethoff's Bevrachtingskantoor B.V.
Commercial Manager	Spliethoff's Bevrachtingskantoor B.V.
Technical Manager	Spliethoff's Bevrachtingskantoor B.V.
Vessel Type	general cargo with container capacity
Build Year	2000
Flag	NLD
Classification Society	BV
Gross Tonnage	16641
Dead Weight	21402
Next Drydock Scheduled Date	Docking Survey, due date 8-July-2027Special Survey, due date 28-Aug-2029

Machinery Details	
Main Engine: Type and Make	Wartsila Corporation (Diesel)
Main Engine: No. of Engines	1
Main Engine: Max Power	12226
Main Engine: Max RPM	382 rpm
Main Engine: Power Limitations	95% from design
Auxiliary Engine: Type and Make	Mitsubishi S6R2
Auxiliary Engine: No. of Engines	3 pcs
Auxiliary Engine: Max Power	450 KW
Boiler: Type and Make	Wiesloch 25-X0-10
Boiler: Capacity	1250 KW
Hull: Antifouling Paint Specification and Paint Name	Hempels Antifouling Globic 9000 78950
Ballast Water Treatment System. Make and model	Panasia GloEn-Patrol capacity 700m3/hour
Loading Computer. Make and model	
Scrubber/EGCS? If yes, Make, Model and Type (Open or Closed Loop)	Alfa Laval PureSOx 68-single inlet sea water system. Open Loop

Consumption	
Annual Main Engine Consumption	7003 HFO / 245 LSMGO
Annual Auxiliary Engines Consumption	428 LSMGO
Annual Boiler Consumption	86 LSMGO
Annual "Other" Consumption	



Operation Profile	
No. of Days Ballast in 1 year	41
No. of Days Laden in 1 year	170
No. of Days Idle/Load port in 1 year	93
No. of Days discharging in 1 year	60
General trade route of the vessel (voyages and ports/topography)	Baltic & US East Coast
Total Annual Distance (365 days)	77222 NM

Existing Energy saving devices and Equipment	
Main Engine	CPP, fixed RPM, shaft generator
Hull	
Auxiliary Engines	
Boiler	Economiser
Others	Shaft generator
Voyage Planning	
Is Auto Logging available on the vessel?	Spliethoff Datacollector
Are Mass Flow Meters installed? If yes, which are the consumers?	Volumetric Flowmeters / Mass flow Main Engine , Auxilliaries & Boiler
Is BWTS Installed? if yes, type and capacity	
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?	No
Shaft Power Meter available?	yes
Economisers (EGB) fitted on AEs and ME?	Only ME
Are VFDs installed? If YES, which all equipment are covered?	
Other Machinery Details where ESDs applicable (e.g. Cargo plant for Gas Carriers)	
Make and Model of Loading software onboard	

Any other information	
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BUSINESS CASE

ANNUAL SAVINGS POTENTIAL OF THE TECHNOLOGIES CONSIDERED

Savings potential

12.8%

MT CO₂ per year savings

3,111

MT Fuel savings

997

Main Engine

960

Aux Engine

37

Other

0

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

1 technology will have impact on EEXI value, and all 7 technologies will have impact on CII ratings

FINANCIALS FOR THE TECHNOLOGIES CONSIDERED

Return of investment (years)

1.84

Total investment USD

774,500

Yearly bunker savings USD

421,881

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)

1.41

Total investment USD

774,500

Yearly bunker savings of USD

421,881

The vessel is found to be trading at around 50 % in the EU region. We have considered for reference assuming 50% 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

127,551 USD

The amended return on investment stated above takes into consideration the amount of 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.



FUELEU MARITIME IMPACT

Existing penalty – 242,689 \$

Penalty post ESD – 211,625 \$

Savings – 31,064 \$

Return Of Investment (Years)

1.33

Total investment USD

774,500

Yearly bunker savings of USD

421,881

For reference, we assumed that 50% of the vessel trades were in the EU region.

Total savings towards FuelEU:

31,064 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	10.81	10.57	10.26	9.95	9.64	9.32
CII Rating	E	E	E	E	E	E
Corrected Rating- NJORD ESD	E	E	E	E	E	E

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, no improvement in savings rate is observed. It remains in 'E' until 2030 from the current rating.
5. Based on the trading profile, to meet CII compliance up to 2030, the vessel might need to improve its operational profile or consider implementing novel technologies to substantially increase its savings.




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
	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 -1.5	15K-25K
	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
	LED	LED lights with low power consumption on AE have a longer running range and are a direct savings.	DS	CII	Both	0.4-1.0	40K-60K
	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	180K-200K



Technology		Description	Savings Category	Regulatory Impact EEXI/CII	Install in Drydock / Service	Savings Range %	Cost Range (USD)
	Main 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-60K

NOTE: As the vessel already has a premium paint, it is not considered for the upgrade.



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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BREAKDOWN OF SAVINGS, COSTS, AND PAYBACK TIME FOR INDIVIDUAL TECHNOLOGIES

DETAILED ANALYSIS OF EVERY TECHNOLOGY AND HOW IT AFFECTS

