ANEMOI ROTOR SAIL TECHNOLOGY

ANEMOI

Associate Member of INTERCARGO
INTERNATIONAL ASSOCIATION OF DRY CARGO SHIPOWNERS

ANEMOI'S MISSION IS TO ACCELERATE THE MARITIME INDUSTRY'S TRANSITION TO ZERO EMISSIONS BY DELIVERING MARKET-LEADING WIND TECHNOLOGY

Global supplier of Rotor Sail technology

GREECE

Our name is a reference to our Greek roots. In Greek mythology, '*The Anemoi'* are wind gods

UNITED KINGDOM

Head Office, *London*
Projects & Engineering Branch, *Brockenhurst*
Test Facility, *Port of Blyth*

CHINA

Anemoi Production & Quality Assurance, *Jiangsu Province*

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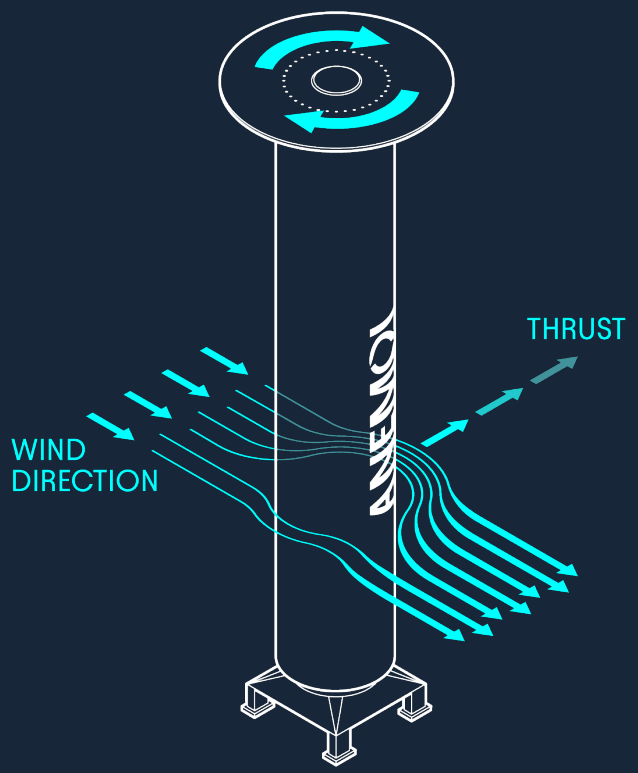
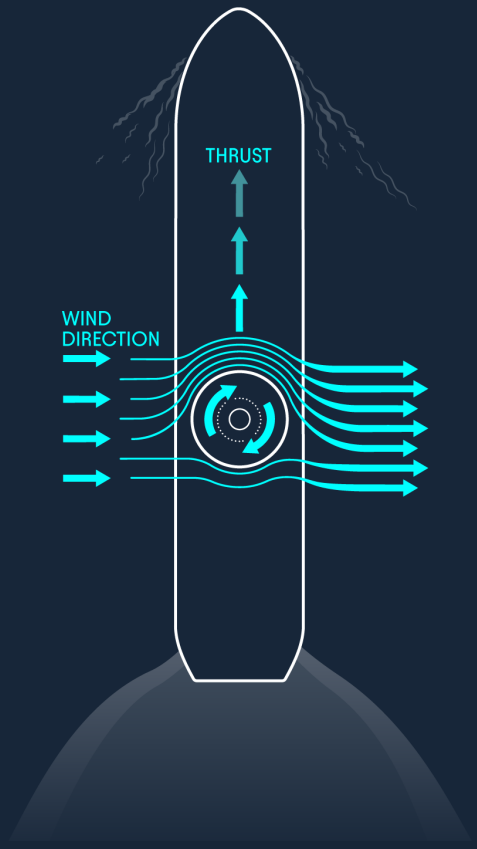
HARNESSING THE MAGNUS EFFECT





- When the wind speed and direction is right, Rotor Sails are switched on automatically and rotated by an electric motor
- As the wind flow meets the spinning Rotor Sails, an aerodynamic phenomenon called the Magnus Effect comes into action
- A difference in pressure is created, which pushes the Rotor Sail forwards and propels the ship

KEY BENEFITS

5-30% reduction in fuel consumption & harmful emissions

Rotor Sails can easily be redeployed between vessels as driven by business requirements

Designed and certified in accordance with leading classification rules

More thrust per m^2 compared to other wind propulsion technologies.

Fully automated to maximise savings

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5M DIAMETER ROTOR SAILS

Available with the following deployment systems:

FOLDING SYSTEM

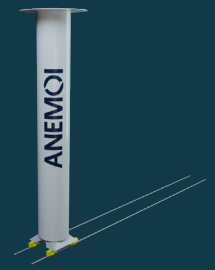
FIXED SYSTEM

Best suited for:

- Panamax
- Kamsarmax
- Capesize
- Newcastlemax
- VLOC
- MR Tanker
- LR Tanker
- Aframax
- Suezmax
- VLCC
- RO-RO
- PCTC
- LNGC
- LPGC
- LCO2

3.5M DIAMETER ROTOR SAILS

Available with the following deployment systems:



LONGITUDINAL RAIL SYSTEM

FIXED SYSTEM

Best suited for:

- Handysize
- Supramax
- Ultramax
- Panamax
- Kamsarmax
- Small ferries
- Small tankers
- Small gas carriers
- Small general cargo vessels

FOLDING DEPLOYMENT SYSTEM

- Folding Rotor Sails can be lowered from the vertical
- Suitable for all vessel types, recommended for Bulk Carriers
- Rotor Sail repositioning in less than 10min
- Minimal impact on cargo and port operations

LONGITUDINAL RAIL DEPLOYMENT SYSTEM

- Rotor Sails on a longitudinal Rail System are transported along the deck by an independent Rail System
- Minimal impact on cargo and port operations
- Suitable for all vessel type, recommended for Bulk Carriers
- Rotor Sail repositioning in less than 15min

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TRANSVERSE RAIL DEPLOYMENT SYSTEM

- Rotor Sails on a transverse Rail System are transported across the deck by an independent Rail System
- Minimal impact on cargo and port operations
- Suitable for all vessel type, recommended for Bulk Carriers
- Rotor Sail repositioning in less than 15min

Image courtesy of Drummond Ltd.


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REFERENCE PROJECTS

ULTRAMAX – AFROS (2018)

4no. 2x16m Rotor Sails

Long. Rail Deployment

KAMSARMAX – TR LADY (2023)

3no. 5x24m Rotor Sails

Trans. Rail Deployment

VLOC – BERGE NEBLINA (2024)

4no. 5x35m Rotor Sails

Folding Deployment

VLOC – SOHAR MAX (2024)

5no. 5x35m Rotor Sails

Folding Deployment

VLOC 400,000 DWT

NSU TUBARAO

RETROFIT

5no. 5x35m Rotor Sails

Folding Deployment

VLOC 325,000 DWT

GRAND PIONEER

RETROFIT

4no. 5x35m Rotor Sails

Folding Deployment

ULTRAMAX | HANDYSIZE

FLEET

NEWBUILDING

12no. 3.5 diameter x 24.5m height

Long. Rail Deployment System

NS United Kaiun Kaisha, Ltd.

裕民航運
U - MING MARINE

MOL

TANKER SEGMENT

VLCC
5 no. 5x35m Rotor Sails
Fixed or Folding Deployment

Estimated Savings (IMO Route):

18.6%*

MR TANKER
2 no. 5x35m Rotor Sails
Folding Deployment

Estimated Savings (IMO Route):

19.5%*

**Sailing at 11-12kts, assuming 300 sailing days (VLCC) and 250 sailing days (MR Tanker) per year.*

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172,000 M^3 LNG CARRIER

4 no. 5x35m Rotor Sails
Fixed or Folding Deployment

Estimated Savings (IMO Route):

2,100 t/year

9.5%*

**Sailing at 14kts, assuming 290 sailing days*

Voyage Optimisation and Rotor Sails
Case vessel: VLOC 400k dwt with 5 Rotor Sails (5x35m)
Voyage time: 34 days

Tubarao (BRTUB)

Manjung (MYMAN)

Fuel cost used: LSFO 745 USD/mt, MGO 885 USD/mt

Weather optimized route

Shortest route

	Consumption	Fuel cost	Savings
Shortest route without rotor sails	1,674 mt	1,274k USD	
With 5 rotor sails (5x35m)	1,494 mt	1,145k USD	~10%
With NAPA Voyage Optimization	1,250 mt	964k USD	~25%

EEXI COMPLIANCE ACHIEVED WITH ROTOR SAILS
INSTALLATION ON VLOC SOHAR MAX

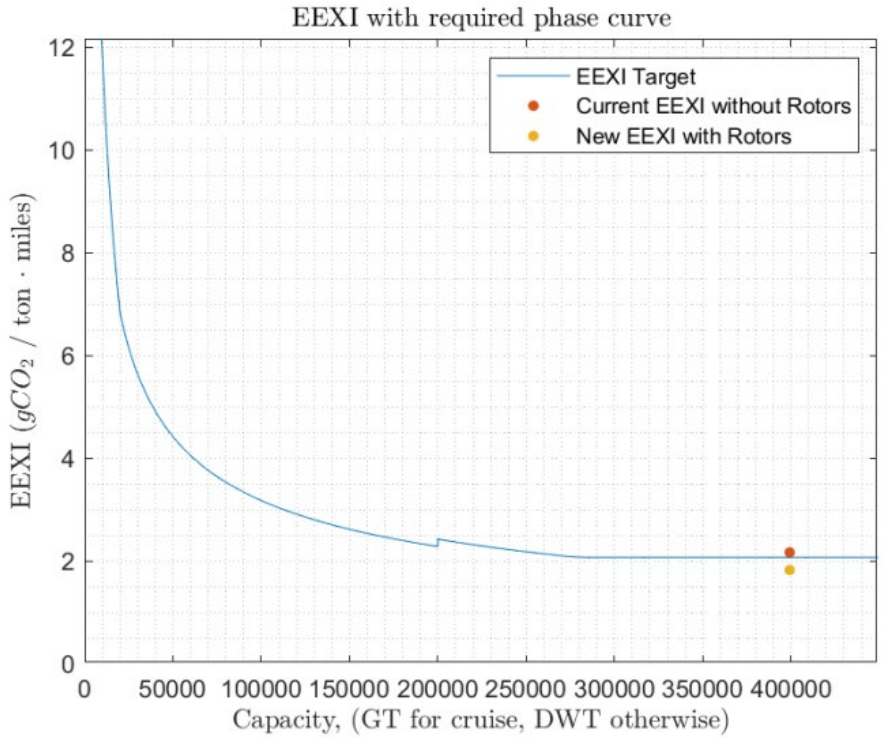
Vessel with out Rotor Sails

Non-compliant

2.07 required to achieve compliance

With 5no. 5x35m Rotor Sails

Compliant



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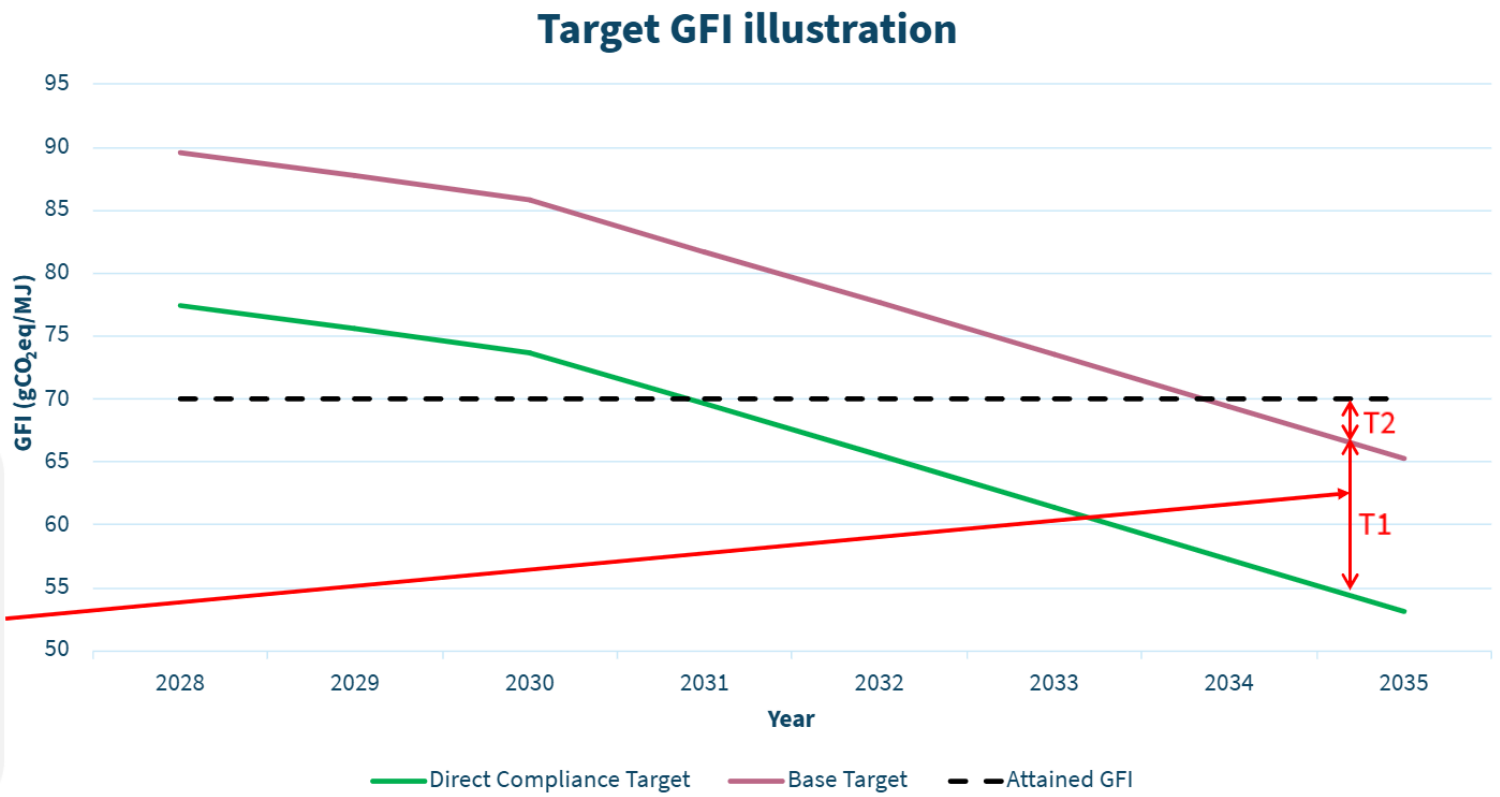
MEPC 83 Outcomes: Rotor Sails can help meet IMO rules faster and more cheaply

What does achieving/ not achieving the targets mean?

Assuming an attained GFI of 70 gCO_2eq/MJ.

2034+: The attained GFI is Greater than the Direct compliance target accruing 'Tier 1' Deficit and greater than the Base target accruing 'Tier 2' deficit.



New GHG Fuel Standard (GFS) and GFI rules focuses on lowering the total greenhouse gas emissions per unit of energy used to move the ship.

Rotor Sails reduce the total fuel consumption, which lowers overall emissions per voyage.

Wind can buy you time and flexibility in the transition to expensive green fuels.

PRODUCTION & DELIVERY

How ANEMOI Rotor Sails Compare…

Easy to Install	Relatively easy to install, typically sails are of modular design with simple connection to foundation. Some electrical equipment to install at MSB and bridge plus cabling to sails and sensors
Suitable to retrofit	Minimal or no structural modifications needed below deck
Compact but high-performing	Small size due to high lift coefficient of ~12 generated by spinning rotor
Low impact to cargo capacity	Low weight due to small size, negligible impact on cargo capacity or stability
Visibility compliance	Sufficient sail area can normally be installed in compliance with SOLAS bridge visibility regulations
Inherently safe	Switching off reduces thrust coefficient by ~95% so there is no requirement to fold sails down in storms.
Low maintenance & OPEX	Few moving parts, well protected inside rotor, simple lubrication schedule with easy access from inside tower

5-30% reduction in fuel consumption and harmful emissions

16 Rotor Sails installed, **30+** in various stages of production and delivery throughout 2025/26 onwards

4 deployment systems and a range of Rotor Sail sizes to suit most vessel type and operations

10+ years of experience in wind propulsion and **7+** years of operational experience

Expert global supply chain with **250+** dedicated production partners

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Scan the QR to connect with Anemoi on LinkedIn

sales@anemoimarine.com
enquiries@anemoimarine.com

www.anemoimarine.com

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