Kites

FACTSHEET

6

Vessel Technology Advice & Support

VTAS

for Fuel Efficient Shipping

This is one of a series of Energy Saving Technologies (EST) factsheets that provide a brief description of emerging technologies which are available to ship owners and other stakeholders who are aiming to reduce fuel consumption and/or Greenhouse Gas (GHG) emissions.

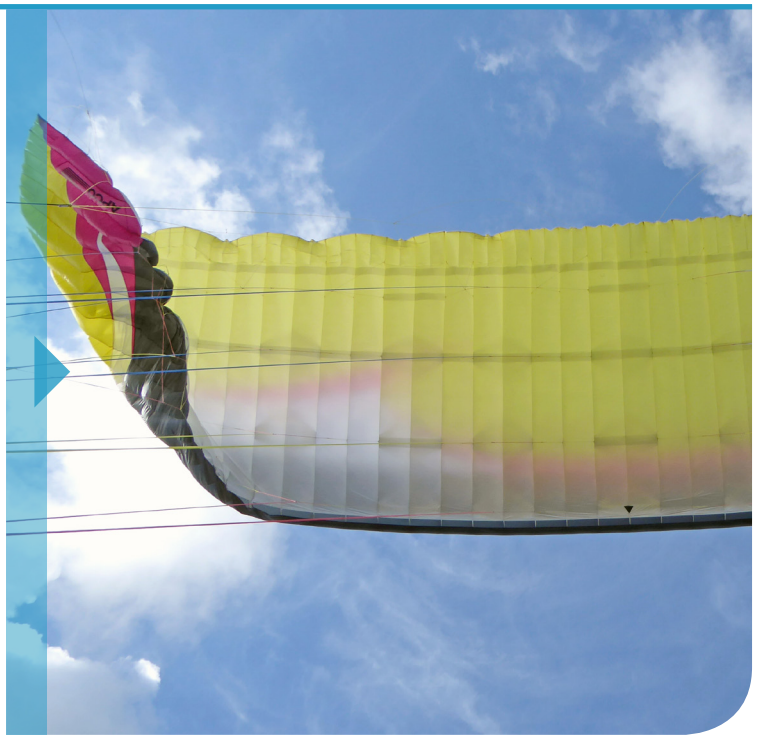
HISTORY

Humans have used kites to harness the energy of the wind for centuries.

Believed to have been invented in Asia more than 2500 years ago, kites have been used for decoration, celebration, sending messages, measuring distances, testing environmental conditions, lifting men, parachuting and signalling for centuries.

In recent decades recreational kite enthusiasts have used technology to optimise 'power kite' designs into aerofoil shapes to generate additional lift and harness additional usable energy.

In 1982, a kite powered boat, the 'Jacob's Ladder', set a world sailing speed record with a speed of 25 knots in 1982. A kiteboard was the first wind powered vessel to exceed 50 knots in 2008.



HOW DO THEY WORK?

Sails provide a propulsive force utilising combination of lift and drag, depending on the type of sail and its position with respect to the apparent wind.

Kite sails are large, generally between 100-450 sqm, and attached to the bow of a ship by a single line via a steering gondola. There is an electronic control system and an automatic retracting system. Sails are launched, recovered and stored at a convenient location and deployed when conditions are right. The kite can be actively controlled to capture the most benefit from the available wind and increase the tractive force.

Kites fly at high altitudes of between 200 and 800 meters, exposing them to higher and more consistent wind speeds than would be experienced by a sail on a ship.

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SELECTING THIS TECHNOLOGY

Kites generally require very little invasive structural modification, lending themselves to retrofit on most ocean going vessels.

Kites are not designed bespoke to a vessel and can therefore be interchanged between vessels and spares centrally stored and maintained.

Stability is not generally an issue with kites, compared with other types of wind harnessing sail types where heeling moments are often present.

They are compatible with most other types of EST. The installation of a controllable pitch propeller (CPP) or a modified FPP would be a complementary modification that can compensate for variations in engine loading.

KEY INTEGRATION FACTORS

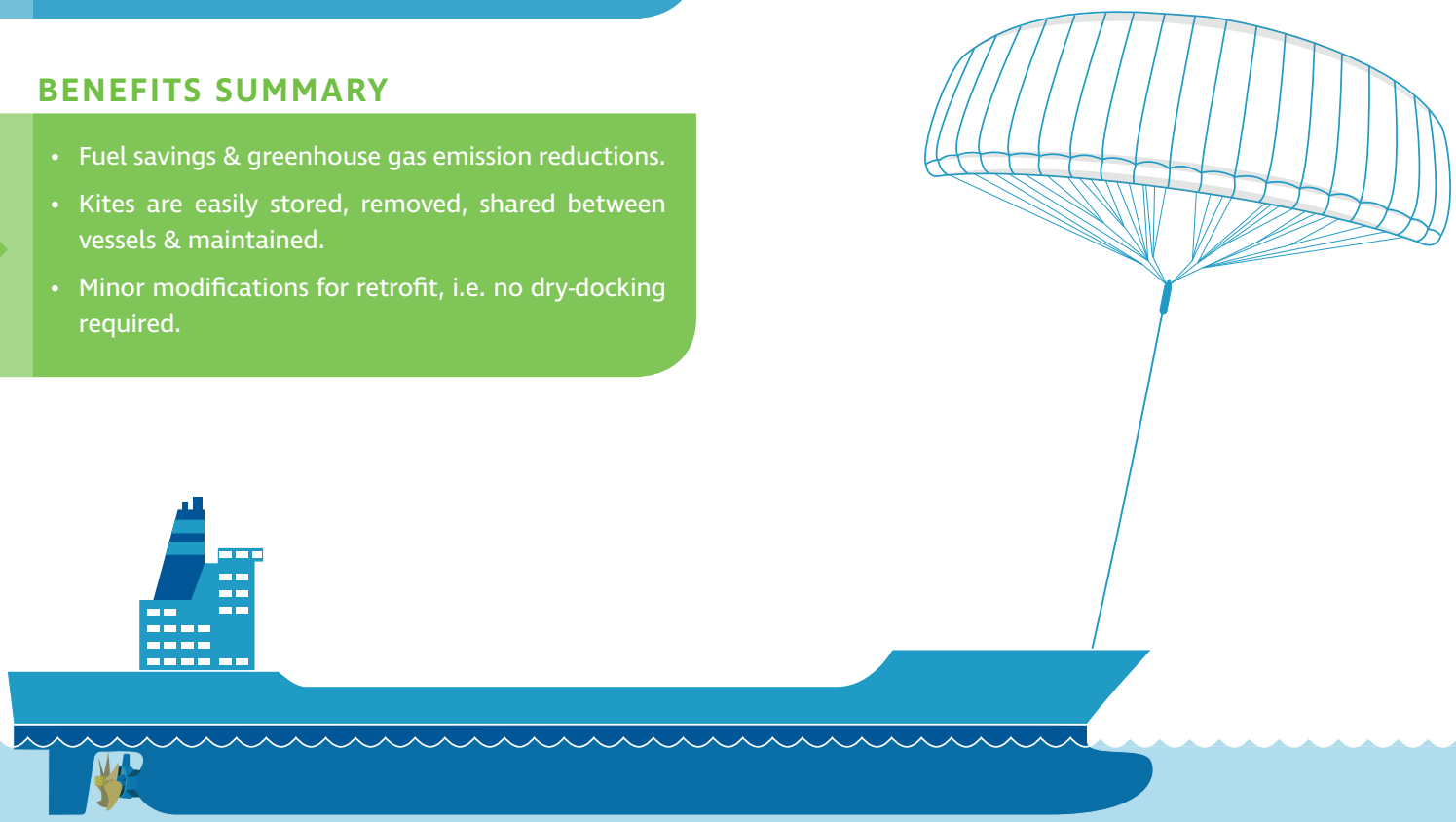
- Wind speeds & sea-states.
- Anticipated wind direction.
- Control system integration & training.
- All systems require an electric power supply for automation.
- Limited manufacturers.

TYPICAL APPLICATIONS

- Vessels travelling at slower cruising speeds in comparison to anticipated relative wind speeds.
- Kites are marketed at cargo ships, yachts & fishing vessels where deck space is a premium & there is a large desire to save on fuel.

BENEFITS SUMMARY

- Fuel savings & greenhouse gas emission reductions.
- Kites are easily stored, removed, shared between vessels & maintained.
- Minor modifications for retrofit, i.e. no dry-docking required.



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HOW WE CAN HELP?

Selecting the right EST for the trades a vessel will undertake is critical to the investment decision. iTEM, at the heart of the VTAS independent assessment process, will consider the technical features of the vessels, the voyage profile all in combination with candidate EST. This is integrated with the risk and financial evaluation using your parameters or those investors are likely to recognise. Collectively this provides an informed view of how selecting appropriate EST contributes to reducing fuel consumption, lowering your operating costs and reducing your greenhouse gas emissions.

To embed this core offering VTAS is able to support you with independent consulting, analysis, feasibility and design integration advice, vessel performance and whole life cost evaluation.

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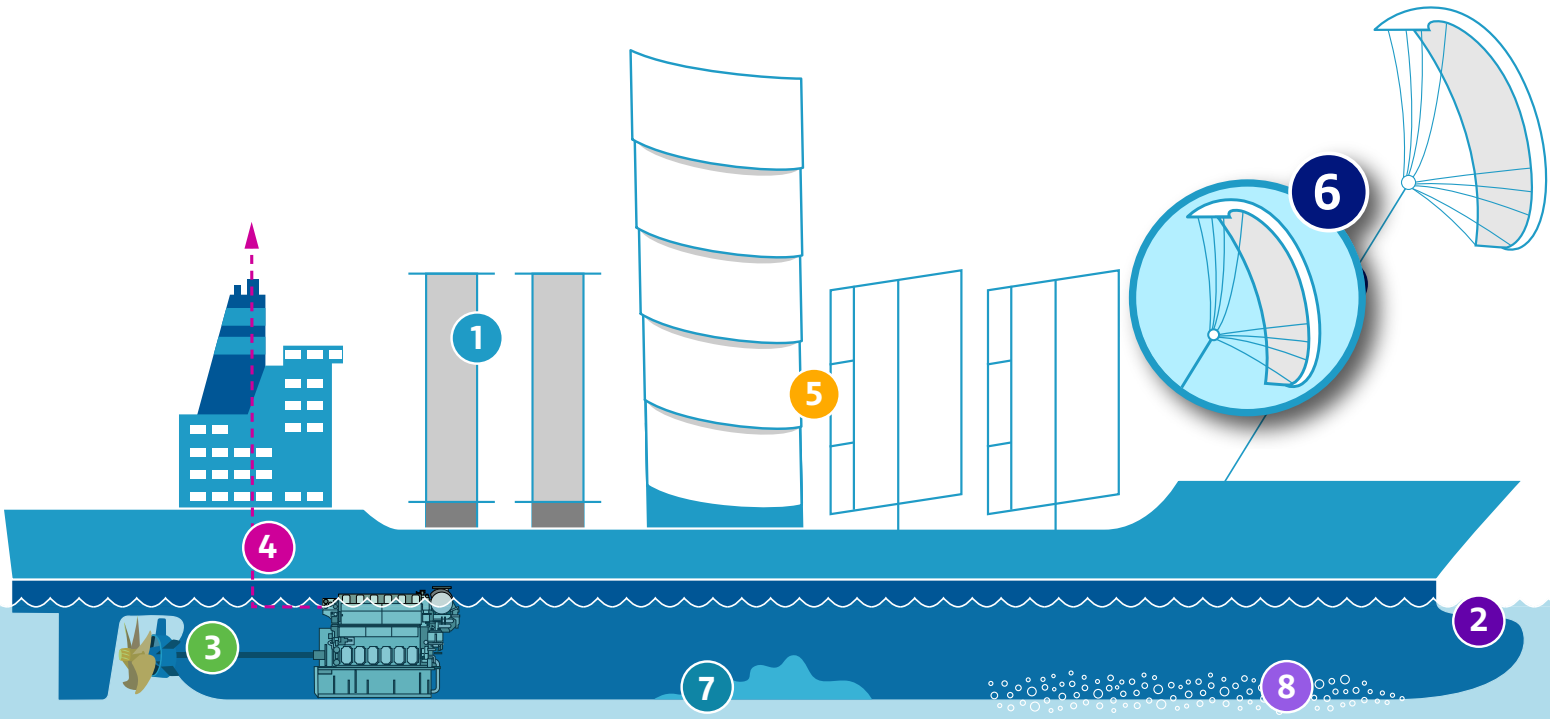
Further information can be found by visiting
www.VTAS-fes.com

or contacting us via
info@VTAS-fes.com



1. Flettner Rotors
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