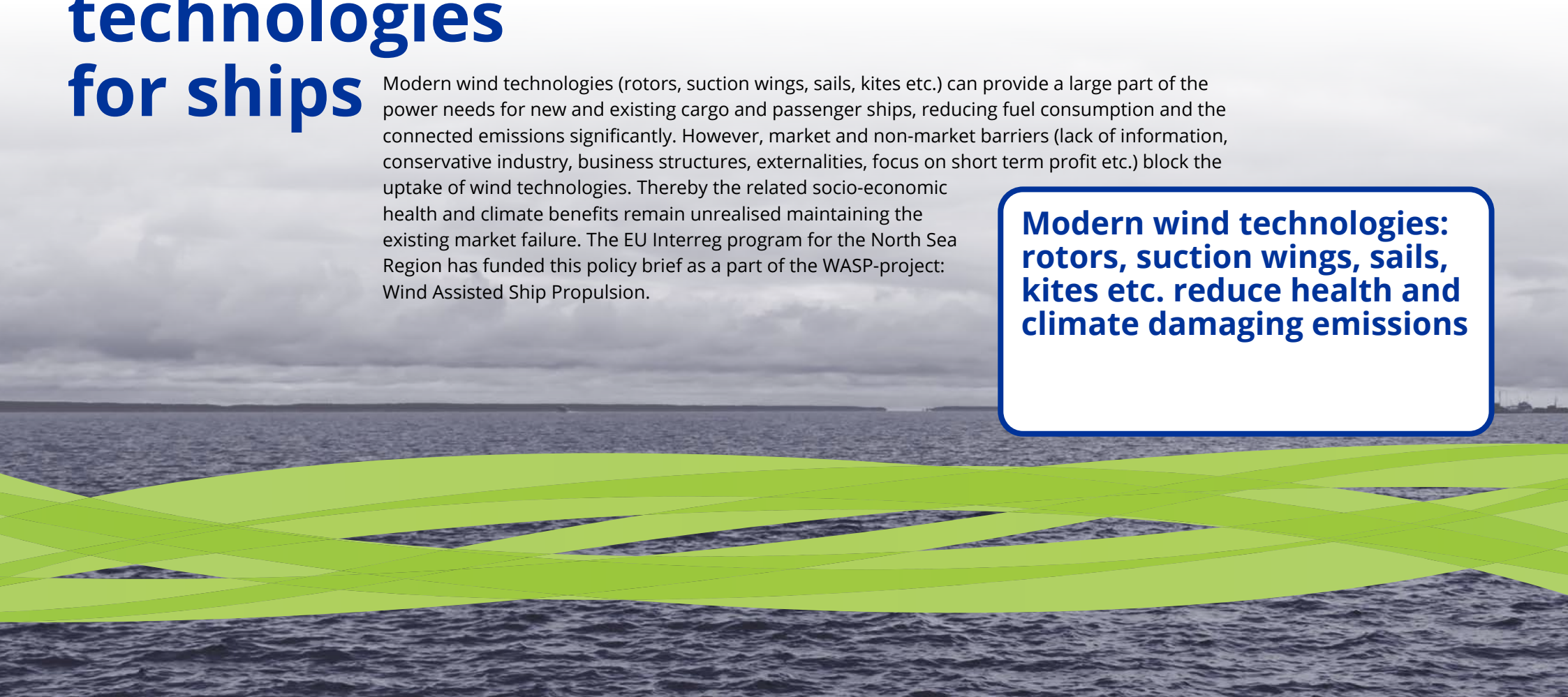
POLICY BRIEF

Socio-economic benefits of wind technologies for ships

Modern wind technologies (rotors, suction wings, sails, kites etc.) can provide a large part of the power needs for new and existing cargo and passenger ships, reducing fuel consumption and the connected emissions significantly. However, market and non-market barriers (lack of information, conservative industry, business structures, externalities, focus on short term profit etc.) block the uptake of wind technologies. Thereby the related socio-economic health and climate benefits remain unrealised maintaining the existing market failure. The EU Interreg program for the North Sea Region has funded this policy brief as a part of the WASP-project: Wind Assisted Ship Propulsion.

Modern wind technologies: rotors, suction wings, sails, kites etc. reduce health and climate damaging emissions



Key climate and environmental challenges for shipping

1. Projected increase in CO_2-emissions conflicts with all UN climate goals.
2. Heavy air pollution contributes significantly to morbidity and mortality.
3. Clean fuels increase fuel cost 3-4 times, which will keep ships fossil fuelled.

Shipping will continue to pollute significantly without regulatory intervention

Wind technologies reduce marine fuel use significantly

1. Reducing CO_2-emissions and air pollution from the existing and future fleet.
2. Reducing the price gap between fossil fuelled ships and zero emission shipping.
3. Reducing the investments and time needed for full decarbonization of shipping.

Wind technologies consolidate shipping as the green logistic driver of globalization

Socio-economic benefits of wind technologies

1. Societies around the North Sea gain around $ 3,200 due to avoided health damage every time wind technologies save one ton of marine fuel oil (0.1% sulphur).
2. Societies around the North Sea gain $ 500,000-800,000 per year due to avoided health damage every time larger ships in the area are retrofitted with wind technologies.
3. On top of health benefits, fuel savings by wind technologies result in less climate change, reduced marine acidification and less damage on crops, the built environment and ecosystems.
4. The rising number of market-driven installations of wind technologies clearly illustrates that just the fuel saving (at the low current fuel oil price) makes some wind technologies favorable.
5. Outside the North European emission control area benefits of wind technologies will be even greater.

Wind technologies saving marine fuel are a very favorable investment for society

More information:
www.northsearegion.eu/wasp

Wind technologies

Existing wind technologies offer free non-polluting energy delivered directly to the ship at sea without investments in fuel infrastructure. Wind as 'green propulsion' is more efficient than any 'green fuel'.

Fuel savings from wind technologies retrofitted onto existing ships vary from 5-25% depending on ship size, type and speed, route and weather conditions etc., as well as type, size and number of wind technologies applied. For new ships where wind technologies are further developed and fully integrated and the ships are designed to use wind propulsion, fuel savings well above 30% are to be expected.

Three illustrative WASP installations

Ship name: Copenhagen
Type: RoPax Ferry
Vessel data: LOA 169.5m; Max. Breadth: 25.40m
Wind system installation: 5m(d) and 30m(h) Flettner rotor (installed 2020).
Expected average annual fuel savings: 4-5%
Company: Scandlines
Project: WASP supported by the EU Interreg North Sea Europe programme

Ship name: Frisian Sea
Type: General Cargo
Vessel data: LOA 118.19m; 6447DWT
Wind system installation: 2 x 11m(h) suction wings (installed 2021)
Expected average annual fuel savings: 8-10%
Company: Boomsma Shipping
Project: WASP supported by the EU Interreg North Sea Europe programme

Ship name: Ankie
Type: General Cargo
Vessel data: LOA 90m, 3,638DWT
Wind system installation: 2 x 10m(h) suction wings (installed 2020). In 2021: 2 x 16m(h)
Expected average annual fuel savings: 5-10%
Company: Van Dam Shipping
Project: WASP supported by the EU Interreg North Sea Europe programme

Futher information

WASP report: New Wind Propulsion Technology - A Literature Review of Recent Adoptions: Read more ...

WASP policy brief: Wind technologies for cleaner shipping: Read more ...

WASP scientific research paper: Economic impact of Wind Assisted Ship Propulsion Technology: Read more...

WASP educational material: Wind Assisted Ship Propulsion: Read more ...

IMO document on wind propulsion solutions: Read more ...

EU study on potentials for wind propulsion: Read more ...

International Windship Association: Read more ...

Ship name: Maersk Pelican (now Timberwolf)
Type: LR2 Product Tanker
Vessel data: LOA 245m, 109,647DWT
Wind system installation: 2 x 30m(h) x 5m(w) rotor sails (installed 2018)
Third party verified average annual fuel savings: 8.2%

Facts about the WASP project

EU project type:	Interreg North Sea Europe programme (part of the ERDF)
Project acronym:	WASP (Wind Assisted Ship Propulsion)
Project full title:	Run Wind Propulsion Technology real life trials on sea going ships in operation > showcase proven concepts > market adoption > green sea transport
Project No.	38-2-6-19
Coordinator:	Netherlands Maritime Technology Foundation
Homepage:	www.northsearegion.eu/wasp