

“ENGINEERED BY MICHELIN,  
POWERED BY WIND”



DESIGN: SAGENCE SEA TO SEA

## THE SHIPPING CONTEXT AND HOW MICHELIN IS RESPONDING

In a context of ever-growing international trade – with flows forecast to increase threefold by the end of 2050 – the International Maritime Organization (IMO) adopted a revised strategy, in July 2023, to reduce greenhouse gas (GHG) emissions from shipping.

In particular, this includes:

- Greater ambition to achieve net zero GHG emissions “close to” 2050,
- Indicative checkpoints aimed at reducing emissions by at least 20% (striving for 30%) by 2030, and by at least 70% (striving for 80%) by 2040, compared to 2008 levels.

In parallel, Michelin is rolling out its Michelin In Motion 2030 strategy, based on balanced development between People, Profit and Planet. This strategy aims to conquer new markets, with the ramp-up of new high value-added business areas in, around and beyond tires. WISAMO, with its wind propulsion, is fully in line with the Michelin Group’s environmental strategy.

## OUR AMBITION

WISAMO – Wing Sail Mobility – is an incubation initiative of the Michelin Group. Our ambition is to contribute to maritime transport decarbonization by improving the environmental footprint of merchant ships, reducing their fuel consumption – and therefore their GHG emissions – through its innovative wind propulsion solution.

## OUR SOLUTION

To meet this ambition, WISAMO is developing a wind propulsion solution using the force of the wind to create thrust and propel ships forward. In the form of a large inflatable wingsail, it can be used as the main mode of propulsion or in hybrid mode, in addition to engine power.

WISAMO wingsail technology has three key features:

- **A telescopic mast** -fully retractable - that raises and lowers automatically.
- **A lightweight and sturdy fabric envelope**, inflated by fans to form a symmetrical-shaped wingsail.
- **An automated control system** that manages hoisting and lowering operations, optimizes performance and ensures safety according to weather conditions.

With a total surface area when deployed of 800 sq. m. The installation can include from one to six wings, offering a surface area of almost 5,000 sq. m, depending on the ship. With a maximum height of 60 meters, the mast is fully retractable to adapt the surface area to weather conditions.

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## ADVANTAGES

Adaptable to all types of merchant ship (e.g. ro-ro, bulk carrier, container ship, etc.), the WISAMO wingsail can be easily retrofitted to existing vessels, or incorporated into the design of newbuild ships.

### Easy-to-use

- The system is fully self-operating to optimize performance and use in total safety.
- The solution requires only few crew training.
- The telescopic mast meets the port constraints.

### Robust

- Continuous low-pressure inflation by fans protects against premature wear of components.
- By keeping its shape with low-pressure, the fan allow the wingsail to operate despite punctures.

### Cost-Effective

- Depending on the ship's design, speed, chosen route, the estimated fuel savings can vary up to 20% for retrofit and more for new build ships.
- A solution that meets the requirements of IMO's CII and EEXI.
- Optimum return on investment thanks to the savings made.

## MILESTONES

The Michelin R&D teams in Switzerland have been developing the technology **since 2020**.

**2021:** A 100 sq. m prototype wingsail was installed on the yacht of the French sailor Michel Desjoyeaux, to test the technology and identify areas for improvement.

**2022:** The WISAMO team moved to Nantes (France), to focus firmly on the shipping ecosystem. Partnership signed with the merchant shipping company Compagnie Maritime Nantaise.

**2023:** A second 100 sq. m prototype was installed on the merchant navy vessel MN Pelican, to be tested under real-life conditions in the Bay of Biscay, between Pool (UK) and Bilbao (Spain). On this occasion, the system was strengthened to withstand violent winter winds, the aim being to test for robustness, check the hoisting and lowering mechanics and test the system in a maritime transport setting. The prototype will be dismantled at the end of 2023, marking the completion of the first phrase of testing under real conditions.

The technical team moved to Vannes to develop and assemble prototypes for the full-scale 800 sq. m wingsail. At the end of this year, the design of the 800 sq. m version will be delivered, which is a key milestone in WISAMO's technical development plan .

**Early 2024:** The Vannes Michelin site will be converted to welcome the assembly workshops of the first production series and set up for mass production.

**2025:** Onshore testing of the full-scale wingsail – or Proof of Concept – to start.

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## OUR TEAM

Our team comprises approximately fifteen people, split between Nantes, where the Direction is based, and Vannes, home to the Technical Team.

WISAMO has a true start-up approach and is enriched by diversity at all levels, with:

- **Wide-ranging skill profiles** : Experts from a wide range of maritime backgrounds, most of them specialized engineers with unique skills in fluid mechanics, performance, automation and test validation.
- **A wide range of backgrounds** : Our team is composed equally of people from inside and outside the Michelin Group, giving WISAMO an open-minded philosophy and its own special dynamics.
- **Various nationalities** : Five nationalities (Swiss, German, Turkish and Brazilian and French) are represented, enhancing opening mindedness and enriching the way we work.
- **Gender diversity** : Parity between men and women is respected, with two women engineers in particular.

All these talented people work together with the same objective of delivering high-performing WISAMO wingsail, in order to achieve mass commercialization and industrialization.