



MOBULA 8

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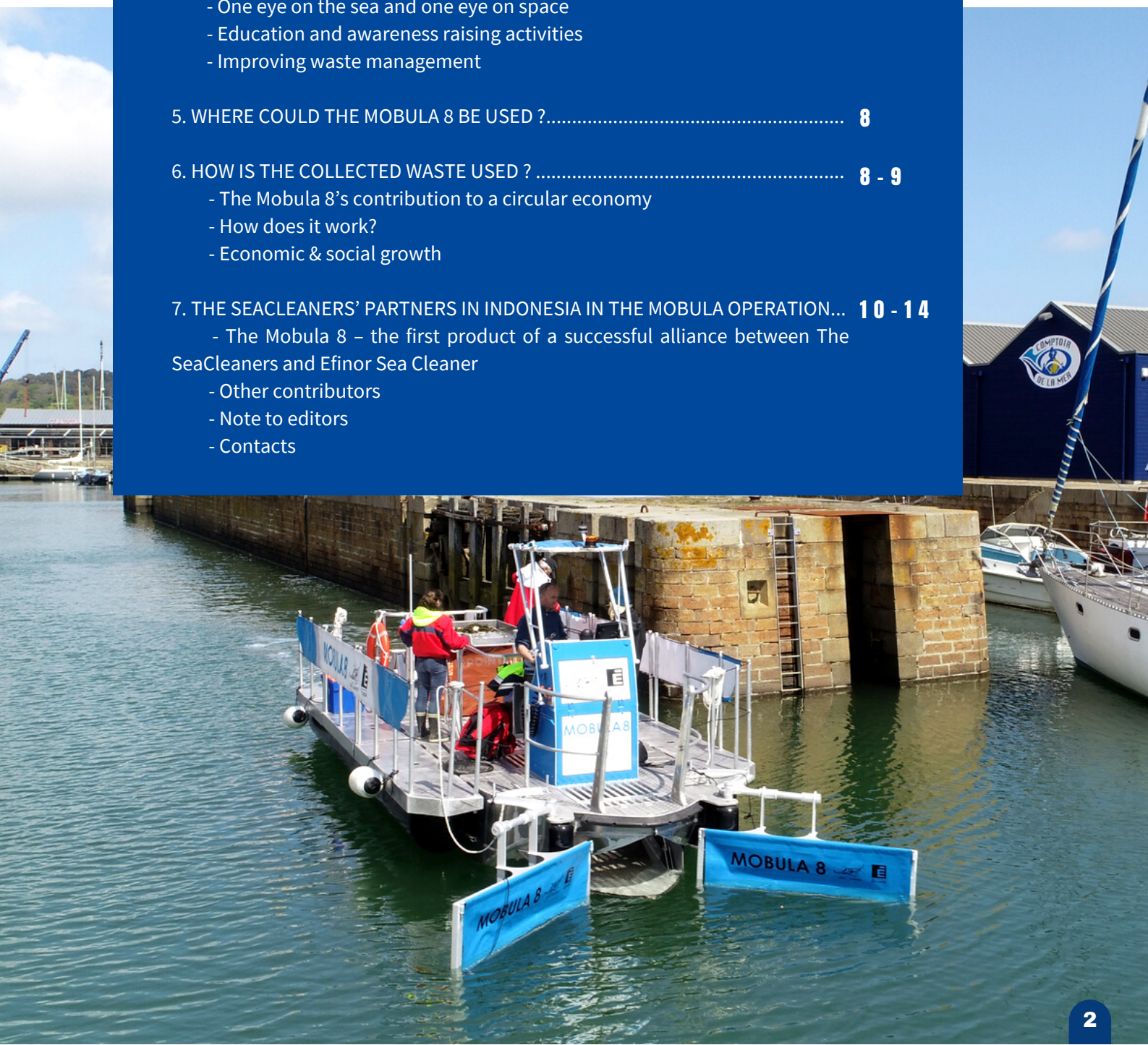
BY THE SEACLEANERS &
EFINOR SEA CLEANER



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A FEW WORDS FROM YVAN BOURGNON, PRESIDENT OF THE SEACLEANERS

Since 2016, our team at The SeaCleaners has been fighting on all fronts, without hesitation, to combat marine plastic pollution.

So here we are in Indonesia!

We are proud and honoured that our versatile depollution boat Mobula 8 is contributing, in its own way, to the Indonesian national strategy which aims to reduce marine plastic pollution by 70% by 2025. In concrete terms, The SeaCleaners is in Bali to clean up the rivers and coastal areas, and to have a visible

impact, but also to act alongside all the actors mobilised to contribute to a sustainable change in behaviour and reduce waste at source.

We are working tirelessly to make our a NGO a comprehensive and accomplished player in ocean depollution. The path traveled over the past 6 years is impressive. The one to come is even more.



ABOUT YVAN BOURGNON

Since childhood, Yvan Bourgnon has loved the sea. He was 8 years old when he accompanied his parents for four years sailing around the world. **Adventurer, champion and record-holding navigator, he saw the oceans deteriorate before his eyes, degraded by plastic pollution.**

During trans-atlantic competitions, Yvan Bourgnon often collided with containers or unidentified floating objects (UFOs), making him aware of the increase of plastic pollution. In his years of navigation around the world, he was shocked by the increase of pollution floating in the oceans.

In his solo world tours sailing a 6.30 m sports catamaran from 2013 to 2015, he was stunned to discover the idyllic, wild and natural places become places of discarded trash, plastic debris and junk.

Upon his return to France, he decided to take action and conceived The SeaCleaners and the Manta project in 2016.

Yvan Bourgnon still participates in sailing competitions and world championships, especially with his son, Mathis Bourgnon.

1. PRESENTATION OF THE MOBULA 8

- The Mobula 8 is a multi-purpose decontamination boat codeveloped by The SeaCleaners association and its partner, the French SME EFINOR Sea Cleaner
- It is designed to **fight against the most widespread types of pollution**, and is equally capable of collecting floating debris, microwaste* and oil spillings
- **A truly self-sufficient waste collection station**, the Mobula 8 is a focal point of unique solutions for collecting solid and liquid waste and cleaning contaminated areas
- It is designed for **decontamination projects** in calm and protected waters, such as coastal areas, lake areas, mangrove swamps, rivers, canals and at sea up to 6 nautical miles from the coast.
- Its first port of call is Bali in Indonesia in **2023**



2. WHY CLEAN UP RIVERS AND COASTAL AREAS?

Studies on ocean plastic pollution show that rivers are one of the main ways plastic travels from land to the ocean. The exact amount of plastic waste in rivers remains unknown, but we estimate it to be between 1.15 and 2.45 million tonnes per year (1).



The transportation of plastic via rivers is largely influenced by local conditions (e.g. environmental and structural).

Furthermore, waste in rivers is concentrated and easily collected. It is less degraded by seawater and UV rays than marine waste and is easier to recycle – whether this is for material or energy recovery.

The SeaCleaners therefore hopes to act early by using the **Mobula 8** to collect waste in rivers, estuaries and near ports. The latter are strategic areas of intervention because different waste streams are located near to one another, namely river waste, maritime transport waste and land waste from nearby towns and villages.

(1) Laurent Lebreton et al. *River plastic emissions to the world's oceans*. 2017.

3. HOW DOES THE MOBULA 8 RISE UP TO THE CHALLENGE?

- Simultaneously collects **debris, microwaste*** and **oil spillings**
- Surface cleaning capacity of **15,000 sqm per hour**
- Can collect floating waste, both liquid and solid, up to **0.4 m below the surface**
- Collection range of **4 m**, thanks to funnelling apparatus installed at the front
- Microwaste collected for scientific purposes from **30 microns to 2 mm**
- Suction up **2,5 to 4 m** upstream of the vessel
- Solid waste storage capacity of **5 – 8 cubic meters** (2,400 kg) in big bags
- Liquid waste storage capacity of **600 litres**
- Hazardous waste stored in dedicated boxes



* collected for the purpose of scientific study

THE ADVANTAGES OF THE MOBULA 8

Designed for collection projects, including those in the least accessible areas

Operated by one boat captain and by one or two sorting operators

Can be transported by truck (in a container), drastically reducing costs and speeding up deployment

Quick to intervene; switches from navigation mode to decontamination mode in less than 3 minutes for rapid action

Platform enlarged by inflatable fenders to increase the boat's stability

REDUCED ENVIRONMENTAL IMPACT

- The Mobula 8's structure is made of aluminium, a strong, weather-resistant material that can be recycled indefinitely
- It is light and does few large-scale movements, reducing its fuel consumption
- A life cycle analysis of the boat was carried out by global leader **Capgemini Engineering** (formerly Altran). The study showed that the Mobula 8 represents an environmentally efficient solution, i.e. that the environmental impact associated with the boat's construction, the extraction of raw materials, its propulsion, its overall consumption, its maintenance and the recovery of collected waste are lower than the environmental benefits generated.

The EcoPlex project: to enable architects of complex systems to quickly and regularly assess the environmental impact of their design choices, such as was the objective of the Ecoplex project led by Manta Innovation, the integrated engineering office of The SeaCleaners. Our teams have developed a procedure and software to eco-design complex systems applied to the naval domain. The Mobula 8 and Mobula 10 case studies were used to develop this tool called Ecoplex.

To carry out this mission, The SeaCleaners worked with various partners: Obeo, Capgemini Engineering, Stirling Design International, LS2N, Efinor Sea Cleaner, and was helped by a grant from the Brittany Region. This mission enabled the Life Cycle Assessment (LCA) studies of the Mobula 8 and Mobula 10 to be carried out, the results of which will be taken into account in the development of the new boats with Efinor Sea Cleaner.



SUCCESSFUL, PATENTED TECHNOLOGY BY EFINOR SEA CLEANER:

Effectiveness proven by OHMSETT and CEDRE tests

A project endorsed by the marine science and technology cluster Pôle Mer Bretagne Atlantique

Bureau Veritas certification for structure and stability

Certified by the French maritime authorities



EFINOR



Engine	90	hp outboard
Maximum speed	7	knots
Cleaning speed	0 - 2	knots
Hull length	9.20	m
Hull width	3.80	m
Lightship weight (with floats)	2,400	kg
Mean draught	0.80	m

DETAILS

The vessel is equipped with a net for recovering microwaste (especially microplastics) for scientific study. Different mesh sizes can be used depending on the shape of waste found, from 500 to 2,000 microns.

4. THE SEACLEANERS'S WORK IN INDONESIA

INDONESIAN NATIONAL PLAN TO FIGHT AGAINST MARINE PLASTIC POLLUTION



The Government of Indonesia has set up an ambitious goal of reducing waste production by 30% and marine plastic pollution by 70% by 2025, in the framework of the “National Policy & Strategy on Management of Household Waste and Household- like Waste”.

The Mobula 8 is embedded in this framework through a Memorandum of Understanding signed in July 2022 with **the Ministry of Maritime Sovereignty and Energy coordinating Maritime Affairs and Investment (Kemenko Marves)**.

SCIENTIFIC ACTIVITIES



Removing waste from the water goes hand in hand with data collection. The Mobula 8 boat operators count and classify floating waste into 8 families. Their geographical distribution is located in an open data map, contributing to a better understanding of the pollution in the area. Local researchers, supported by the INTERNATIONAL SCIENTIFIC ADVISORY BOARD of The SeaCleaners, are on board to work on the characterisation of the macro-waste collected, on land and at sea, as well as on the sampling of micro-plastics.

The SeaCleaners uses also various **ESRI** tools, notably QuickCapture and Survey123 , and has developed a specific application to know the location and category of the waste collected by the Mobula 8.

ONE EYE ON THE SEA AND ONE EYE ON SPACE



The SeaCleaners has partnered with **CLS** (Collecte Localisation Satellite, a subsidiary of the French Space Agency CNES), a global pioneer in Earth observation.

The CLS provides data on monitoring and modelling of marine plastic waste drift in Indonesian waters and expertise in locating polluted marine areas in Indonesia.

The SeaCleaners team will also release CLS beacons at sea around Bali to study the drift of marine litter.

EDUCATION AND AWARENESS RAISING ACTIVITIES



Spectacular clean-ups by the Mobula 8 provide opportunities to organize awareness raising campaigns about plastic pollution. This strategy is paired with efforts to reduce plastic waste as its source and as part of a larger move toward a circular economy. To achieve that, local and international partners and The SeaCleaners volunteers conduct educational activities, school visits and clean-up days, in the nearby locations where the boat operates.

Together with Indonesian stakeholders, our teams develop educational tools and materials tailored to the local context to raise awareness about the importance of preserving the Ocean, explain the impact of plastic pollution, and spread solutions to change towards an eco-lifestyle.

IMPROVING WASTE MANAGEMENT



Since September 2022, The SeaCleaners supports the local communities in the rural area of Amed to improve waste management with the local association **Peduli Alam**. The SeaCleaners provides financial and technical support to projects already underway. In particular, we will equip the area with new bins to achieve efficient collection, to develop a sorting centre with the help of our sponsor Valorplast and to raise awareness.

The SeaCleaners is also supporting **Gili Eco Trust**, an association based in Gili Trawangan that operates in the field of waste collection and treatment on the island. This project is based on 3 main missions: improving the existing sorting centre with our sponsor Valorplast, improving the management of residual waste and financing collection and awareness tools.

5. WHERE COULD THE MOBULA 8 BE USED?

Although we are starting our collection work in Bali, more precisely Denpasar and the Benoa port area, twenty potential sites for calm water intervention have been identified for clean-up activities by The SeaCleaners' Operational Hub. These activities will be co-led by associates, businesses and local communities.

As well as its clean-up mission, the Mobula 8 is also paving the way for future collection campaigns carried out by the MANTA*, The SeaCleaners' flagship project. Its aim is to identify, locate, qualify and quantify areas where the pollution is most dense and difficult to access, and where MANTA campaigns for collecting marine plastic waste are likely to be more appropriate.

*see p.13 for more information about the MANTA

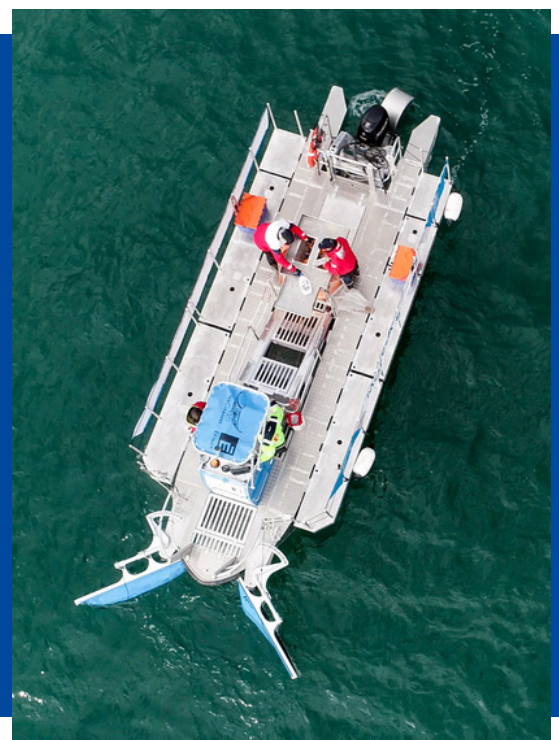


6. HOW IS THE COLLECTED WASTE USED?

THE MOBULA 8'S CONTRIBUTION TO A CIRCULAR ECONOMY

Thanks to our partner **Capgemini Engineering** (formerly Altran), two parametric studies have been carried out to determine the economic and environmental impact of different decontamination and waste recycling solutions envisaged by The SeaCleaners.

These studies showed that, by contributing to the implementation of a circular economy on land, the Mobula 8 was an economically viable solution with a minimal environmental impact.



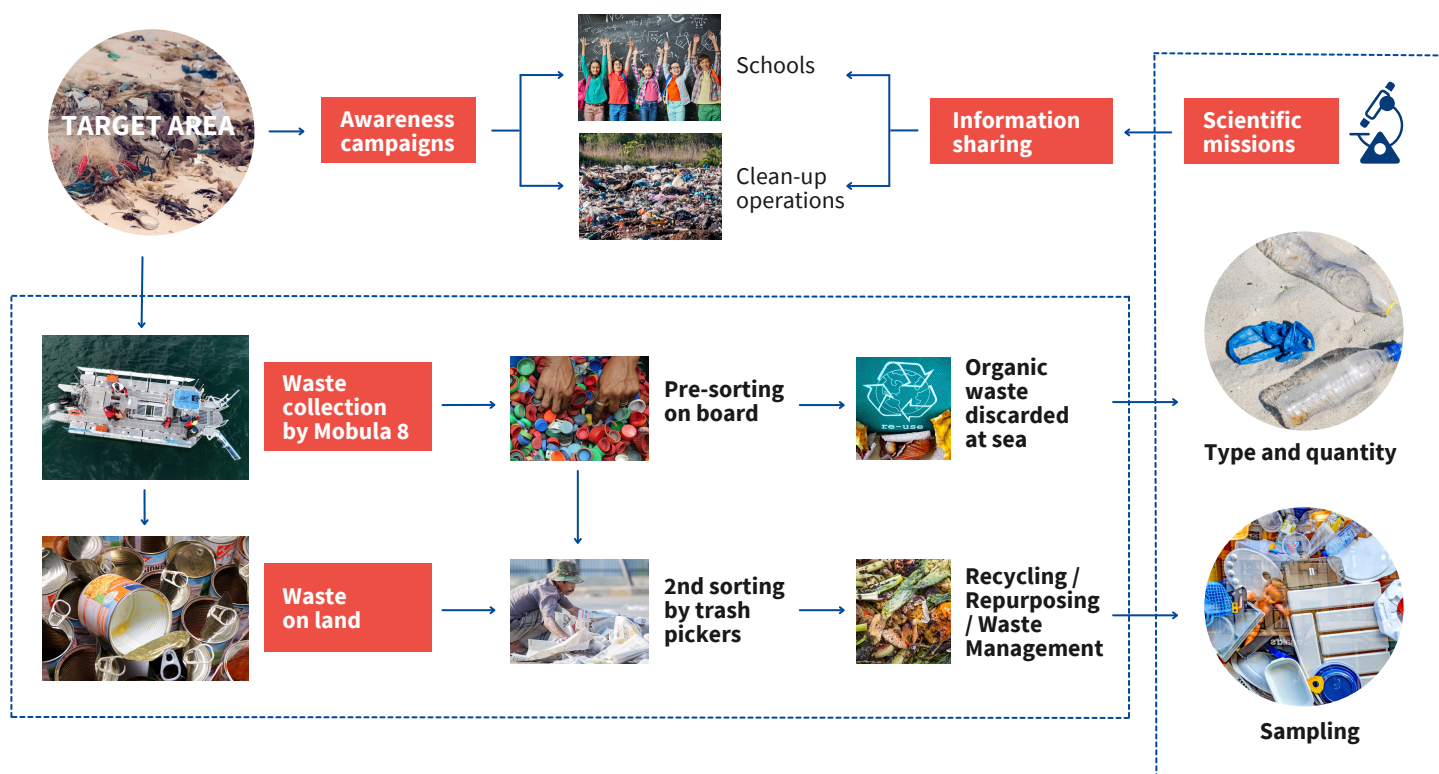
HOW DOES IT WORK?

Firstly, the aquatic waste collected by the Mobula in rivers, canals and estuaries will be transported to sorting centres, where waste from different waste streams is also treated (e.g. land waste, collected by trucks in towns and villages located near the port, and boating waste).

The sorting centre will then separate the plastic and non-plastic waste.

The plastic waste will either be recycled or converted into energy using low tech waste-to-energy units, while the non-plastic waste will be entrusted to appropriate recycling facilities.

Removing waste from the water goes hand in hand with data collection. The Mobula 8 boat operators count and classify floating waste into 8 families. Their geographical distribution is located in an open data map, contributing to a better understanding of the pollution in the area and to our scientific mission.



ECONOMIC AND SOCIAL GROWTH

Through this project, The SeaCleaners not only plans to help clean up the environment, but also to help stimulate the local economy by creating jobs.

Partnerships with local recycling associations will be established, and “small players” in the informal economy, who earn money by collecting and selling waste, will be able to contribute, either by continuing their work or by working on the Mobula and earning a full salary.

The SeaCleaners aims to complement the use of the Mobula 8 by encouraging local waste recycling activity. These solutions, which are low tech and accessible, generate local revenue, helping to create a social solidarity economy.

7-THE SEACLEANERS' PARTNERS IN INDONESIA IN THE MOBULA OPERATION



Ministry of Maritime Sovereignty and Energy coordinating Maritime Affairs and Investment of the Republic of Indonesia (Kemenko Marves).

Kemenkomarves is one of our most valuable supporters in Indonesia.



KEMENTERIAN KOORDINATOR BIDANG KEMARITIMAN DAN INVESTASI

[website](#)

Bali Marine Service

Operation partner for the Mobula 8.



Bali Marine Service

[website](#)

Rotary 3420

Our awareness partners to trigger long term behavioural changes in the fight against plastic pollution.



[website](#)

Gili Eco Trust

Peduli Alam

Gili Eco Trust and Peduli Alam will benefit from The SeaCleaners' technical assistance to improve the existing waste management facilities.



GILI ECO TRUST

[website](#)



Peduli Alam

[website](#)

France Alliance Bali

French Institute

A natural partnership with these two entities to activate awareness and education actions in French and Indonesian.



[website](#)



Liberté
Créativité
Diversité

[website](#)

Efinor Sea Cleaner

Efinor Sea Cleaner is the manufacturer of the Mobula 8. A shipyard and an expert in multi-service pollution control vessels, Efinor Sea Cleaner detains innovative patented technology. The crew of the Mobula 8 is trained jointly by Efinor Sea Cleaner and The SeaCleaners.



EFINOR

[website](#)

UDAYANA university

Our main scientific partner for research on plastic pollution.



[website](#)

CLS (Collecte Localisation Satellite)

A major partner for The SeaCleaners, CLS is a pioneer in providing Earth observation since 1986. Its vision is to imagine and deploy innovative solutions to understand and protect our planet and manage its resources sustainably.



COLLECTE LOCALISATION SATELLITES

[website](#)

Valorplast

A pioneer company in the recycling of household plastic packaging.



[website](#)

CCI Indonesia

IFCCI gathers the French and Indonesian business communities with the objective of developing bilateral professional contacts.



[website](#)

French Embassy

An essential and priceless support for The SeaCleaners.

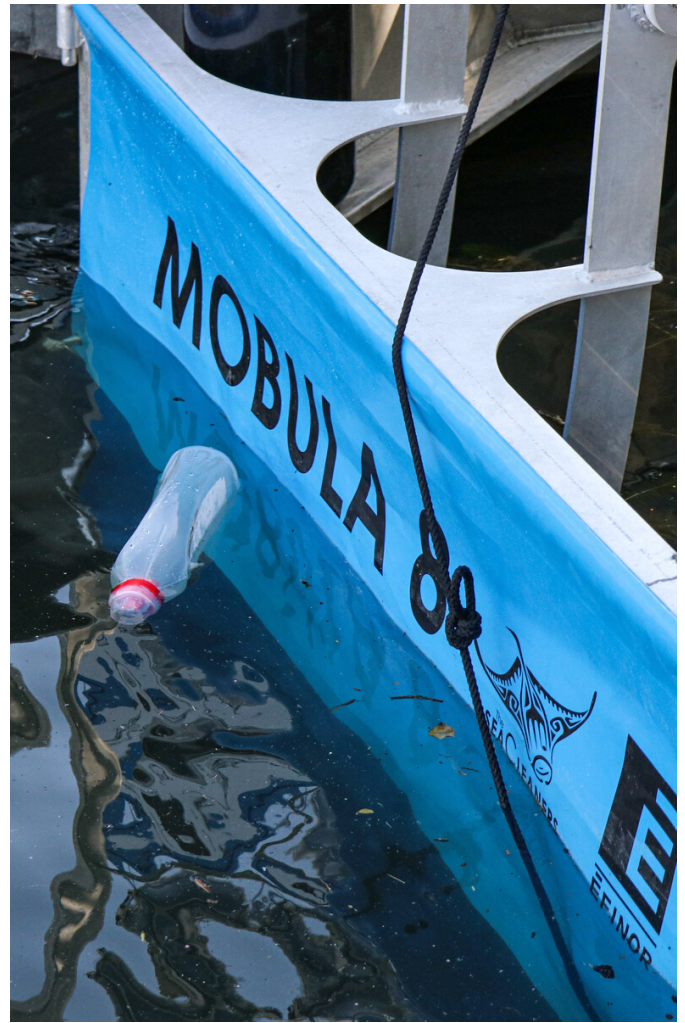


[website](#)

THE MOBULA 8 – THE FIRST PRODUCT OF A SUCCESSFUL ALLIANCE BETWEEN THE SEACLEANERS AND EFINOR SEA CLEANER

The Mobula 8 will be supplemented by its larger counterpart the Mobula 10, a 10 m multi-purpose decontamination boat that is capable of operating in rougher sea conditions, and of going from island to island to collect waste.

- **The Mobula 8** operates in calm and protected waters (6 nautical miles from the coast), such as lake areas, rivers, mangrove swamps, etc.
- **The Mobula 10** is designed to operate in rougher waters, such as coastal waters up to 20 nautical miles from the coast, in rivers with strong currents, etc.



Inspired by the eagle ray

The Mobula range takes its name from the mobula ray, also called the eagle ray. These rays closely resemble manta rays, but are distinguished by their mouth being situated below the body rather than at the front. The biggest species is the Mobula mobular, a Mediterranean ray that can reach 5 m in size, weigh a tonne and perform spectacular jumps above the water. Similarly, Mobula 8 and Mobula 10 resemble the MANTA, The SeaCleaners' flagship decontamination boat. They have a common goal and mission of collecting plastic waste, while also being smaller and more agile, capable of operating in narrow and shallow areas.



It wasn't just their similar names that inspired the partnership between these two associations, but also a desire to share their respective expertise in order to launch a programme for co-developing innovative plastic waste collection solutions. The result was the Mobula 8.

EFINOR Sea Cleaner, based in Paimpol (Côtes-d'Armor, Brittany), specialises in the design, production and marketing of multi-purpose decontamination vessels equipped with patented technology. EFINOR Sea Cleaner has 10 years of research and development under its belt, as well as over 100 references in 30 countries in the field of multi-purpose decontamination boats.

Meanwhile, The SeaCleaners (a public interest association formed under the law of 1901) was founded in 2016 to fight against plastic pollution. Through its MANTA INNOVATION* (SAS) division, The SeaCleaners develops innovative technological solutions for collecting and recycling floating plastic debris – one of these being the flagship MANTA project.

EFINOR Sea Cleaner and The Sea Cleaners use their partnership to develop collection solutions that complement the MANTA, allowing intervention in narrow and shallow areas where movement is limited.

EFINOR Sea Cleaner and MANTA INNOVATION are selling these co-developed solutions (including the Mobula 8) to public and private organisations wishing to take part in marine decontamination campaigns.

*MANTA INNOVATION, The SeaCleaners technical hub



EFINOR



THE
SEACLEANERS

OTHER CONTRIBUTORS

Two leading French organisations have also contributed to the Mobula 8's development: Technip Energies and the IRD.

Technip Energies shared its expertise during the Mobula 8's design phase and while integrating new decontamination solutions.

Technip Energies is a leading engineering and technology company working towards energy transition, with leading positions in Liquefied Natural Gas (LNG), hydrogen and ethylene, as well as an increasing market presence in blue and green hydrogen, sustainable chemistry and the management of CO². The business benefits from a robust project delivery model, which is supported by an extensive range of technology, products and services.

The French National Research Institute for Sustainable Development (IRD) has allowed the project to be certified by **Pôle Mer Bretagne Atlantique**.

The IRD is a multi-discipline French public research body and a participant in international development. It uses an original model: equal partnership with developing countries. The IRD's research priorities adhere to the UN's Sustainable Development Goals (SDGs), and aim to support development policies and the innovation of solutions adapted to the environmental, economic, social and cultural challenges that humanity and the planet face.

NOTE TO EDITORS

About EFINOR Sea Cleaner

EFINOR SEA CLEANER is a subsidiary of the industrial group EFINOR, which was founded in 1988, and sells cleaning and decontamination vessels. As both the designer and manufacturer, the company has developed unique, innovative and patented technologies used by all its vessels. It can collect floating solid waste and liquid waste such as hydrocarbons.

The teams are working in parallel on R&D projects, in particular through the design of prototype systems and vessels to meet the specific needs of marine environmental protection. They propose alternative solutions in terms of more environmentally friendly propulsion [hybridisation, 100% electric] and have also recently developed prototypes to respond to the specific problems of green algae and sargassum.

<https://www.efinorseacleaner.com>



The SeaCleaners is also developing a pioneering solution for collecting and recycling floating plastic debris; the MANTA, an innovative vessel equipped with an onboard factory, which will be launched in 2025. This giant of the seas will be the first deep-sea vessel capable of collecting and treating large amounts of floating ocean waste before it breaks down and permanently enters the marine ecosystem. A true technological triumph, the Manta will be powered by several types of renewable energy technology, minimising its carbon footprint.

About The SeaCleaners

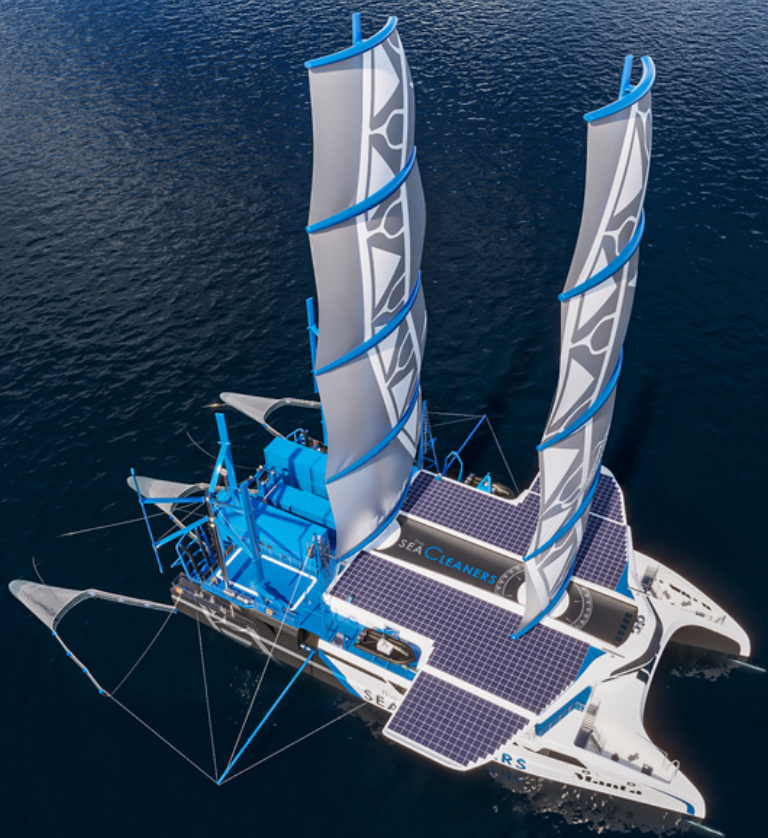
The SeaCleaners has 35 employees. Its headquarters are located in the west of France, in Brittany, at La Trinite-sur-Mer, but its sponsorship, marketing and communication team is based in Paris.

Created in 2016 by the French-Swiss navigator and explorer Yvan Bourgnon, the public interest association The SeaCleaners offers concrete solutions for plastic pollution, both on land and at sea, through corrective and preventative missions.

The SeaCleaners has Observer Status on the UN Environment Programme and the Convention on biological diversity, and is supported by the Prince Albert II of Monaco Foundation and the CCI France International network. It has four missions:

- Protecting the environment by collecting floating waste, and gathering land waste using its teams of volunteers
- Education initiatives aimed at the public and at policy makers, alongside raising awareness in affected populations
- Scientific research
- Promoting the transition towards a circular economy

www.theseacleaners.org



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