

ACHIEVING THE SUSTAINABILITY GOALS WITH THE SEACLEANERS

Ocean plastic pollution **undermines the achievement of several of the 17 Sustainable Development Goals (SDGs)**, commitments adopted by UN member states to promote shared prosperity and protect the planet by 2030.

Fighting against the scourge of ocean plastic pollution, at all levels, is to participate in responding to the global challenges we face.

By joining The SeaCleaners, you are joining the movement of those who are working towards a more sustainable future for all and transforming the world.



ODD #1

1 NO POVERTY



THE OBSERVATION:

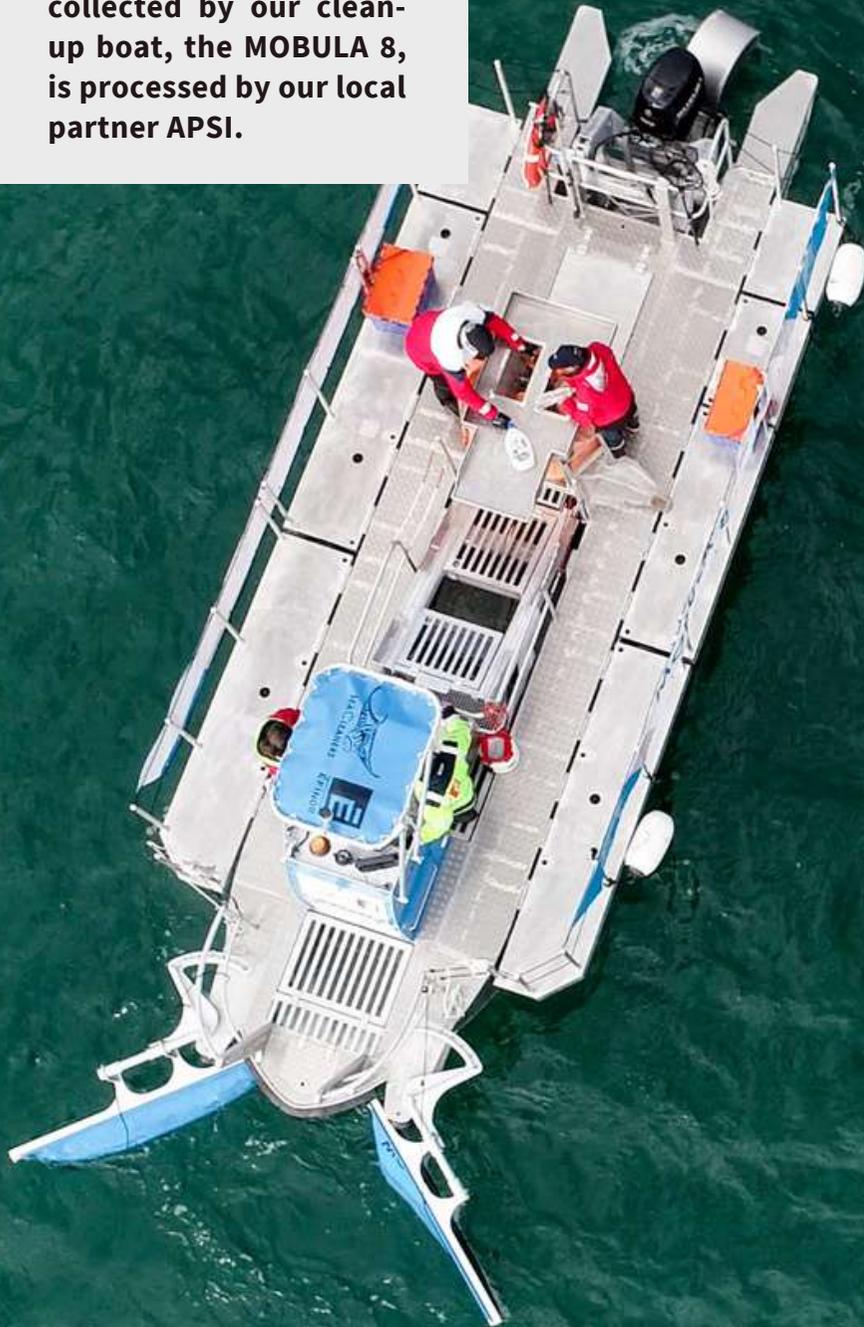
By treating plastic as a **resource** rather than as a waste product with negative externalities, it is possible to fundamentally change our relationship with plastic. Improving the recyclability of plastic material can both **give value to used plastic** and solve a large part of the problem of waste left in nature.

In many countries there are experiments in which plastic waste becomes a "currency". **Used plastic is sold at a slightly higher price than virgin plastic** to companies that then reuse it in their manufacturing processes by telling consumers where the plastic comes from - that is, plastic collected by low-skilled or unskilled workers, who have an opportunity to lift themselves out of poverty, while helping to clean up the environment and the oceans.

These so-called **Social Plastic** initiatives create new jobs in low-income communities, encourage plastic collectors to become micro-entrepreneurs, offer the opportunity to trade this recycled plastic for goods or services to improve the collectors' daily lives, demonstrate the commercial value of plastic waste by finding a profitable outlet for it, and ultimately slow down the production of virgin plastic.



In Indonesia, the waste collected by our clean-up boat, the MOBULA 8, is processed by our local partner APSI.



THE IMPACT OF THE SEACLEANERS:

In the countries where we operate, The SeaCleaners supports and encourages Social Plastic initiatives. In Indonesia, for example, the waste collected by our clean-up boat, the Mobula 8, is processed by our local partner **APSI** (Asosiasi Pengusaha Sampah Indonesia), **one of the main professional associations for waste recycling in Indonesia**. It currently comprises 268 companies, the majority of which are small and medium-sized enterprises and self-employed workers, involved in waste management and recycling in the major cities and provinces of Indonesia. The association is one of the key players in the transition to a green, green and circular economy in Indonesia, one of the five countries in the world most affected by the ravages of plastic pollution and where there are still many open and uncontrolled waste dumps.

At the same time, through the activities of our scientific department and our advocacy work, we encourage **companies in the plastics industry to intensify their efforts in the area of plastic recyclability** and promote the initiatives of our sponsors in this direction.

ODD # 2

2 ZERO HUNGER



THE OBSERVATION:

The ocean is an essential **global food source**. From 1990 to today, the amount of wild and farmed fish consumed in the world has increased by 122%.¹ Fishing is vital to the food security of more than **a billion people** around the world. For some countries, such as Ghana, Sierra Leone and Sri Lanka, fish consumption accounts for more than 50% of animal protein intake. Fishing is also a means of subsistence for 39 million workers who are directly employed in this sector.

Yet **plastic pollution is having a deadly effect on the world's fish stocks**. One in three marine mammals and virtually all fish have already ingested plastic during their life cycle, either in the form of macro-waste or, more insidiously, in the form of micro-particles, which are released by the slow and inexorable degradation of marine litter. It is estimated that there are 500 times more plastic microparticles in the oceans today than there are stars in the known universe: up to **12,000 microparticles** per liter of water,² which will be ingested by fish, shellfish and zooplankton.

A recent study has shown that microplastics are found in the flesh of almost all seafood.³ Chronic ingestion of these micro- and nano-particles, in addition to causing significant mortality in marine life, affects the growth and reproduction of fish.⁴ In some species, **the reproduction rate drops by 50% and the weight decreases by 20 to 35%**.

The threat of plastic to the global food balance is therefore real.

[1] The State of World Fisheries and Aquaculture 2020, SOFIA Report, FAO

[2] Rethink Plastic Alliance, November 2020

[3] University of Gand, 2017

[4] Journal of Hazardous Materials, INRAE/ IFREMER/universités de Bordeaux et Orebrö, August 5, 2021



Every piece of floating plastic waste removed from the water is waste that will not end up in a fish's stomach.

THE IMPACT OF THE SEACLEANERS:

Thanks to its various means of collection and its on-board factory, the Manta will be able to collect and process **3 tons of waste per hour**. 90% of floating waste is plastic, which represents about **5,000 billion pieces of plastic**. Every piece of floating plastic waste removed from the water is waste that will not end up in a fish's stomach, break down into micro-particles and contribute to the destruction of the world's fish stocks.

Furthermore, while it is impossible with current technology to hope to eliminate the liability of microplastics in the oceans, it is crucial to intensify **research efforts** to understand the processes at work in the degradation of macroplastic waste into microparticles and the consequences of this phenomenon on marine wildlife. The MANTA, a research vessel that will house state-of-the-art scientific facilities, will be **at the forefront** of conducting these much-needed studies and **adding to global knowledge** in this area.

ODD #3

3 GOOD HEALTH AND WELL-BEING



THE OBSERVATION:

The presence of plastic microparticles in our bodies is proven. These fine particles of degraded plastic are found in the air, drinking water, our food and our soil. The smaller the particle, the more easily it enters the body. According to the latest studies, an adult human can inhale or ingest up to 121,000 particles per year¹ without realizing it.

As a result of the food chain, our own plates are contaminated by the ingestion of large quantities of plastic microparticles in the ocean by fish and shellfish.

Although there is a consensus on the negative consequences of this pollution, the study of the exact effects of this involuntary consumption on human health is a recent research topic, to be considered over several decades.

The risks are multiple. **The threat does not come from a single pollutant, but from multiple toxic contaminants.** Plastic material is most often made from petroleum, to which additives are added to give it certain specificities. We are exposed to both. The additives are the most polluting constituents. This is the case of heavy metals such as titanium, which gives the white colour. Some PVCs contain plasticizers to improve their flexibility, which migrate very easily into the body, and some of which have been identified as endocrine disruptors. The same applies to brominated flame retardants which are added to plastics to increase their fire resistance.

Plastics also have a high capacity to bind external pollutants and can become a growth medium for pathogens such as viruses and bacteria. As they travel, these plastic particles threaten the balance of our ecosystems and our health, with **real impacts on our immune, endocrine, respiratory and DNA systems.**

[1] <https://pubs.acs.org/doi/abs/10.1021/acs.est.9b01517>



The SeaCleaners intervenes before plastic waste degrades and becomes micro-particles likely to enter our bodies.

THE IMPACT OF THE SEACLEANERS:

Through its **clean-up** actions, both on land and at sea, The SeaCleaners intervenes before plastic waste degrades and becomes micro-particles likely to enter our bodies.

Through its awareness-raising activities, the association also strives to pass on **eco-actions** and teaches consumers to get rid of everyday plastic objects and replace them with more **sustainable alternatives** that are both more environmentally friendly and healthier.



ODD #6

6 CLEAN WATER AND SANITATION



THE OBSERVATION:

Nearly 800 million people on the planet do not have access to clean water. While shortages, lack of sustainable resource management, disparities in access to sanitation and hygiene, and emissions of chemicals and hazardous materials partly explain this situation, there is one factor that should not be overlooked: pollution from dumping waste.

The pollution of rivers by plastic waste deteriorates the quality of freshwater in the most vulnerable regions. Plastics are veritable "sponges" for viruses and bacteria, and can even serve as **growth media and means of transport for pathogens**. For example, various species of Vibrio bacteria can attach themselves to floating microplastics¹ and cause serious infections in humans and animals, the most serious of which is cholera.

In addition, there is a direct link between plastic debris and the risk of infectious diseases. Every piece of plastic that contains water is a **potential breeding ground for insects**, including mosquitoes that can transmit diseases such as malaria, Zika or dengue. This is a major problem, especially in the slums of tropical areas.

Water that is infected in this way requires more **expensive treatments to make it safe to drink again**, such as ozone and chlorine. Because of the higher costs of these treatments, communities often forego them. Water that could potentially be safe for human consumption thus remains unsafe.

Catchment areas such as upstream rivers and canals, natural lakes and man-made reservoirs therefore need to be cleared of plastic waste and then **cleaned up at affordable costs**.

[1] Dangerous hitchhikers? Evidence for potentially pathogenic Vibrio spp. on microplastic particles - ScienceDirect

THE IMPACT OF THE SEACLEANERS:

Domestic sewage, industrial effluent, agricultural runoff and **poorly managed solid waste pollute surface and groundwater in Bali, Indonesia**. The lack of an 'established sewerage system' forces many households to use private septic tanks or to discharge their waste directly into rivers. The prevalence of polluted shallow wells for drinking water leads to gastrointestinal infections.

The SeaCleaners MOBULA 8 clean-up boat, by collecting solid waste (up to 60 cm deep) and sucking up liquid waste (sewage, hydrocarbons, oils, etc.), helps to **limit the risk of spreading pathogens** in the Denpasar region on the island of Bali. It improves water quality by reducing pollution, helps protect and restore water-related ecosystems, wetlands, rivers, aquifers and lakes, and supports and strengthens the participation of local communities in improving water and sanitation management.



The MOBULA 8 improves water quality by reducing pollution, helps protect and restore water-related ecosystems, wetlands, rivers, aquifers and lakes, and supports and strengthens the participation of local communities in improving water and sanitation management.



ODD #7

7 AFFORDABLE AND CLEAN ENERGY



THE OBSERVATION:

The majority of world trade is organized around maritime transport. **80% to 90% of the world's goods are transported by ship.** According to the United Nations Conference on Trade and Development, more than 50,000 ships travel the world's seas each year.

The environmental impact of this industry is significant, particularly in terms of atmospheric emissions. Although ships emit less greenhouse gases (GHGs) than other modes of transport per ton-kilometers of goods transported, they still contribute **2 to 3% of global CO2 emissions**¹ each year.

In the coming years, as **trade intensifies**, global maritime traffic is expected to grow. If no additional measures are taken to limit GHG emissions from ships, these could increase by **20 to 120% by 2050**, depending on the economic situation.

[1] International Maritime Organization, 2019 study

THE IMPACT OF THE SEACLEANERS:

Both in its design and in its operation, the MANTA was designed from the outset to accomplish its multiple missions while being **as environmentally virtuous as possible**.

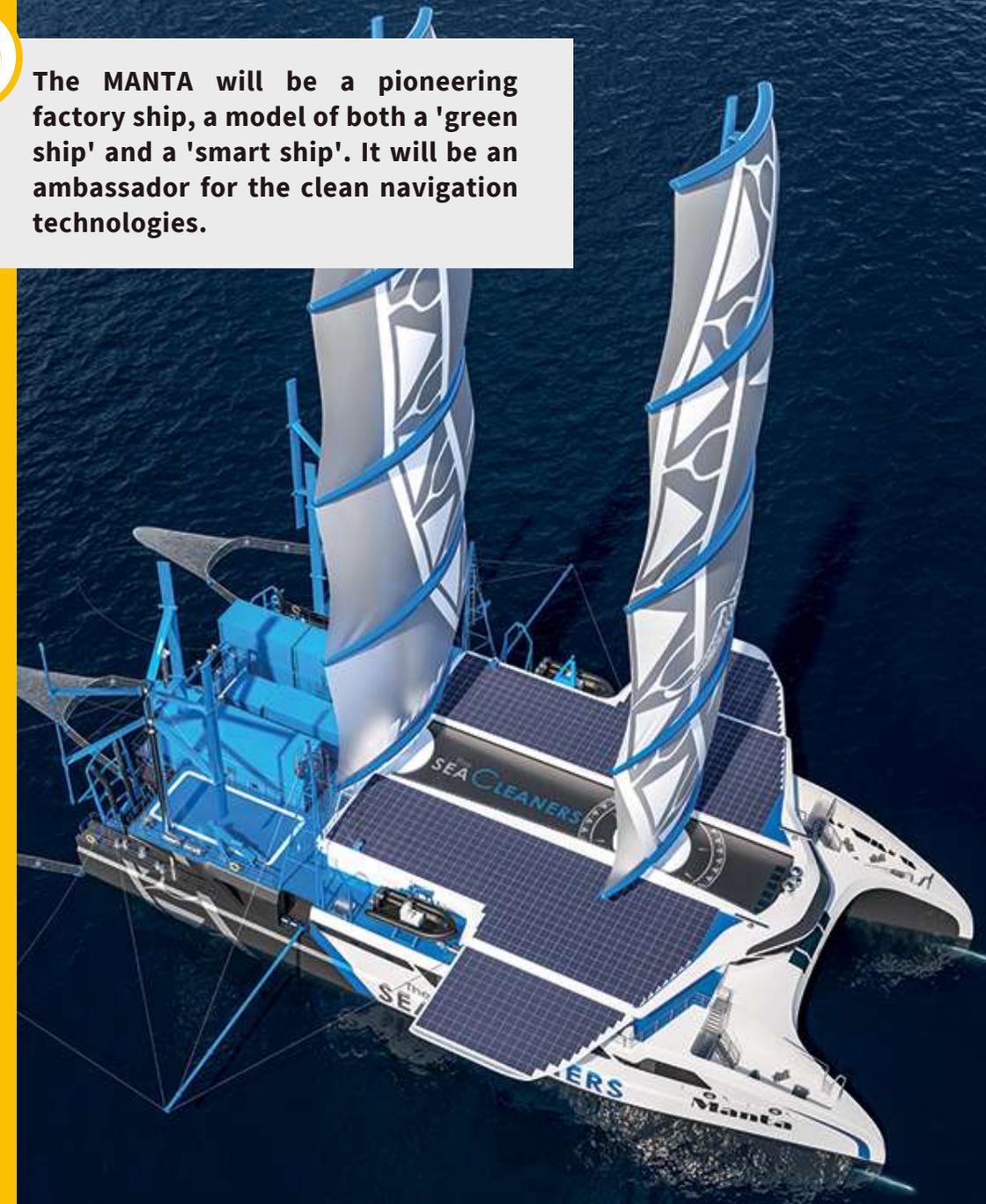
45 000 hours of research and development, involving nearly sixty engineers, have enabled it to be equipped with several technologies designed to **minimize its carbon footprint**. In particular, the MANTA will be equipped with a **tailor-made hybrid propulsion system**, allowing for an optimal combination of propeller-driven propulsion units driven by electric motors, and automated rigging designed to reduce the yachts' energy bill. In parallel, **an integrated energy management system** will continuously calculate the best routes to optimize the energy mix between engines and sails.

The MANTA will also be equipped with several on-board **renewable energy production systems**: wind turbines, hydro-generators, solar panels, a waste-to-energy unit, etc., which aim to reduce the ship's fossil fuel consumption to a strict minimum, while increasing its energy self-sufficiency. The aim is to achieve **50-75% autonomy**.

Thanks to these developments, the MANTA will be a pioneering factory ship, a model of both a 'green ship' and a 'smart ship'. It will be an ambassador for the clean navigation technologies that the maritime industry is now seeking to democratize to limit its environmental footprint.



The MANTA will be a pioneering factory ship, a model of both a 'green ship' and a 'smart ship'. It will be an ambassador for the clean navigation technologies.



ODD #8

8 DECENT WORK AND ECONOMIC GROWTH



THE OBSERVATION:

By substituting the consumption of natural resources with labor and slowing down the "throwaway" economy, **the circular economy** not only preserves raw materials but also **creates jobs**. In a circular economy, used products and materials are reintroduced into the cycle of production, distribution and use, whenever possible. **Waste becomes resource**. In each of the loops of the circular economy, whether it is recycling, remanufacturing, repairing or reusing goods, jobs are generated mainly at local level.

For example, **waste recycling creates 25 times more jobs than landfilling**,^[1] through labor-intensive collection, dismantling, sorting and material recovery.

The repair and reuse of used products creates local or regional jobs that **cannot be relocated**. The shorter the circular economy loop, the greater the substitution of natural resources by labor resources and the greater the creation of local jobs.

[1] Green jobs : towards decent work in a sustainable, low-carbon world, United nations environment programme, September 2018.



Each local project developed by The SeaCleaners would create between 51 and 101 jobs in local communities

THE IMPACT OF THE SEACLEANERS:

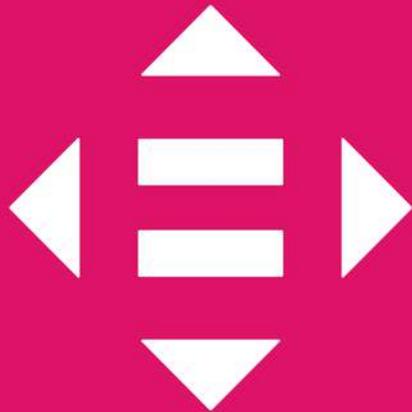
In its field action, **The SeaCleaners is committed to working towards the development of circular economy schemes**, from the collection of marine, river and land-based plastic waste, to its energy or material recovery.

An economic and environmental study carried out by our partner Cap Gemini Engineering (formerly Altran) has shown that each local project developed by The SeaCleaners would create between 51 and 101 jobs in local communities, divided between collection operations on our MOBULA clean-up boats and in trucks, maintenance, manual or mechanized sorting operations, recycling and recovery actions.

For each project, The SeaCleaners establishes trustworthy partnerships with **local actors**, both to better integrate the projects into the local fabric and its specificities, and to promote the **transfer of skills** in waste management and the emergence of **sustainable jobs** within the communities.

ODD #10

10 REDUCED INEQUALITIES



THE OBSERVATION:

"Wherever there are social inequalities, there are also environmental and health inequalities and vice versa".¹ Plastic pollution is no exception to this rule. The countries most affected by this phenomenon are also the poorest. **80% of marine pollution comes from the coastal cities of the poorest countries.** In these regions, collection and recycling systems are often non-existent due to lack of resources. In addition, these countries receive some of the waste from the countries of the North. At the same time, a veritable "waste colonialism" is developing, generating fraud, greenwashing and social injustice. **Plastic therefore ends up in the ocean for lack of alternatives.**

In addition, plastic pollution disproportionately affects **marginalized communities** and those living near plastic waste production and processing sites.²

Finally, ocean plastic waste threatens the **livelihoods** of people who depend on marine resources for their work. It can also lead to a range of **health problems** in communities dependent on the consumption of seafood, now infested with toxic microplastics and nano-plastics, for survival – an estimated one billion people worldwide.

[1] David N. Pellow et Robert J. Brulle, 2018

[2] Neglected : Environmental Justice Impacts of Plastic Pollution, United Nations Environment Program (UNEP) and ONG Azul, March 30, 2021



The SeaCleaners places social justice at the heart of its commitment.



THE IMPACT OF THE SEACLEANERS:

The right to a clean, healthy and sustainable environment was elevated in 2021 to a fundamental human right by the United Nations Human Rights Council.

Through its targeted work to clean up plastic pollution and restore ecosystems, both on land and in areas where plastic waste accumulates, such as coastal areas, river mouths and estuaries, The SeaCleaners places social justice at the heart of its commitment.

ODD #12

12 RESPONSIBLE CONSUMPTION AND PRODUCTION



THE OBSERVATION:

Current global consumption and production is based on excessive and planet-destroying use of natural resources. If the world's population reaches the projected 9.6 billion by 2050, the equivalent of almost three planets will be needed to provide the resources required to sustain current lifestyles.

Plastic is a major part of this dire equation. Between 1950 and 2017, 9.2 billion tons of plastic were produced, or more than one ton for every person currently living on the planet.

The consumption and production of plastics has accelerated at an unprecedented rate recently: more than half of all plastics have been produced since 2005, reaching a global production of more than **400 million tons of plastic in 2020**¹ - the total cumulative weight of humanity!

A large proportion of plastic production is **single-use products and disposable packaging**, which have made 'convenience' possible and have proliferated to become the norm worldwide since the late 1970s. As a result, packaging accounts for more than a third of global plastic production. Of all plastic products, they have the shortest life span: around **40% of plastic products are thrown away after less than a month**, which poses serious environmental problems.

This ephemeral use is countered by an extremely long degradation time. Plastic waste released into the environment takes between **100 and 600 years** to degrade.²

By 2025, over 600 million tons of plastic are expected to be produced. Current recycling systems cannot handle this volume of waste. Just look back: **only 10% of the 9.2 billion tons of plastics that have been put into circulation since the 1950s have been recycled.**

The best solution is to reduce the amount of plastic we produce and consume.

[1] Plastic Atlas, 2020

[2] NOAA



The SeaCleaners strives to promote responsible consumption and to pass on the eco-actions that allow us to reduce plastic waste in our daily lives.

THE IMPACT OF THE SEACLEANERS:

Through its **awareness-raising activities** in schools and extracurricular activities, as part of the events and festivals in which we participate, and through its communication activities aimed at the general public, The SeaCleaners strives to promote **responsible consumption** and to pass on the **eco-actions** that allow us to reduce plastic waste in our daily lives.

ODD #13

13 CLIMATE ACTION



THE OBSERVATION:

Together with the forests, the ocean is one of the two "lungs of the planet". **More than 50% of the oxygen we breathe is provided by phytoplankton**, which are plant micro-organisms.

The ocean is also considered the planet's "**thermostat**". It constantly exchanges energy, moisture, gases and heat with the atmosphere.

These constant exchanges redistribute excess heat across the globe, reducing temperature differences between the poles and the equator.

These multiple interactions make the ocean the largest '**carbon sink**' on the planet, having already absorbed more than 90% of the excess heat of the climate system and a quarter of anthropogenic greenhouse gas emissions.

This mechanism is **threatened by plastic pollution**. Early scientific insights suggest that plastic pollution would reduce the ability of phytoplankton to produce oxygen and capture CO₂ at the surface, and to fix and sequester it at depth. It would also weaken the ability of zooplankton to transport carbon by preventing them from feeding, sustaining and reproducing. Scientific knowledge on the consequences of the exponential presence of micro- and nano-plastics in the ocean on the phenomenon of global warming needs to be further developed.¹

Furthermore, plastic waste, especially polyethylene, will emit GHGs as it degrades in the oceans. This production of GHGs increases further when these plastics are exposed to the sun. And the more the plastic breaks down into smaller pieces, the more gas it will produce.²

At the same time, 4-8% of the world's oil is now used to produce plastics. The industrial processes of extracting the raw materials and then processing them, coupled with transporting them, usually over thousands of kilometers, are high emitters of greenhouse gases (GHGs) such as carbon dioxide and methane. **Global plastics production currently emits as much GHG as 189 coal-fired power plants.**

The industry plans to increase plastics production by 40% by 2030, which will lead to one fifth of global oil consumption being dedicated to plastics production. Plastic production alone could generate 56 billion tons of CO₂ emissions by the middle of the century,³ the equivalent of 615 coal-fired power stations... and consume **10-13% of the global carbon budget** that must not be exceeded to keep temperature rises to 1.5°C.⁴

[1] Plastic Atlas, 2020

[2] Sarah Jeanne Royer et al., Production of methane and ethylene from plastic in the environment, 2018

[3] Center for International Environmental Law (CIEL) Report 2019

[4] Id.



Our association intervenes before the plastic detritus disintegrates and emits GHG in large quantities.

THE IMPACT OF THE SEACLEANERS:

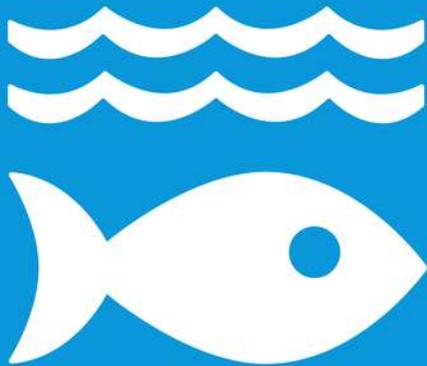
Is plastic pollution derailing our main tool in the fight against global warming?

The SeaCleaners refuses to play the sorcerer's apprentice and is committed on three levels:

- Through its **curative actions of collecting floating macro-waste at sea** in targeted areas of high concentration, our association intervenes before the plastic detritus disintegrates and emits GHG in large quantities.
- Through its **preventive actions**, our association encourages the reduction of the consumption of petrochemical products and encourages the **plastic industries** to be part of the pollution by improving their production processes and by generalizing the use of more environmentally friendly materials.
- Through its **research activities**, the MANTA will contribute to increasing knowledge about **the interactions between marine plastic pollution and global warming**, in order to better control them.

ODD #14

14 LIFE BELOW WATER



THE OBSERVATION:

While plastics have invaded all ecosystems, the ocean is particularly affected. Between **9 and 14 million tons** of plastic waste are dumped into the ocean every year. On average, this is the equivalent of 17 tons per minute, e.g. a lorryload of rubbish.¹

The first victim? Marine biodiversity. In November 2021, more than **3800 marine species, plants, animals and microbes**, are directly impacted by plastic waste.² More than **1.5 million marine animals** die each year because of plastic pollution, including **100,000 marine mammals**.³ These include protected species such as dolphins, sea turtles, hammerhead sharks, blue whales, plus **a million seabirds** and countless fish. They become entangled or strangled in the remains of abandoned tarpaulins or fishing nets (ghost fishing), or die from suffocation or malnutrition as a result of ingesting plastic debris mistaken for their food.

The entire food chain is affected, from plankton to large predators. Mortality rates caused by plastic debris analyzed on stranded animals can be as high as **22% for cetaceans**⁴ and almost **50% for sea turtles**.⁵

[1] 2016 Data, UNEP Report, 2021

[2] <https://litterbase.awi.de>

[3] IRD Study, published 2013

[4] Baulch & Perry, 2014

[5] Rosolem Lima et al., 2018



We act to protect the oceans, but also to repair and restore areas devastated by floating plastics.



THE IMPACT OF THE SEACLEANERS:

According to the United Nations Environment Programme (UNEP), plastic pollution is one of the **three major global environmental challenges** facing humanity, along with global warming and biodiversity conservation. These three issues are interconnected.

Through all our missions, preventive and curative, on land and at sea, we aim to change the rules of the game. We act to protect the oceans, but also to repair and restore areas devastated by floating plastics. Every kilo of plastic that doesn't make it to the ocean or is removed from the ocean is **a plastic that won't kill** a marine animal, or help damage fragile ecosystems. We do not put a price on the **healthy life of marine life**. True to our values of pragmatism and active partnership, we do our part to conserve the oceans, seas and marine resources for sustainable development.