



# Revolutionizing Ocean Cleanup

Autonomous Robotics for Marine  
Litter Collection



# Ocean Litter is an Issue

- **Global Scale:** 26-66 million tons of waste in oceans, mainly settled on the seafloor.
- **Sources:** Coastal tourism, shipping activities, illegal dumping, etc.
- **Impact on Wildlife:** Harms marine life and disrupts ecosystems.
- **Human Health Risks:** Affects seafood safety and coastal community well-being.
- **Remediation Challenges:** Difficulties in large-scale waste detection and removal.

## The unseen litter

Because so much litter is at the bottom of the sea and is out of sight, very little is done to address it.

**SeaClear** is a solution for seafloor litter.

## USV SEACAT THE TRANSPORTER

The SeaCat is the «mothership». It will also carry all the debris collected back to shore.

## DRONE DJI M200 THE OVERWATCH

The drone detects areas of concentration from the air and ensures the navigation safety.



## ROV TORTUGA THE CLEANER

The Tortuga collects the debris on the seafloor and bring them back to the SeaCat.

## ROV MINI TORTUGA THE MAPPER

The ROV Mini TORTUGA scans the area, identifies and maps the sectors to be cleaned.



# The SeaClear Solution

## Innovative Approach

Autonomous robots for efficient marine litter collection.

## Key Components

Unmanned surface vehicle, aerial drone, underwater robots for litter search and collection, collection basket.

## AI

AI-driven detection and collection of marine litter

## Scalable

Adaptable to various coastal and marine environments

# Coastal Cities and Municipalities



## Your issue

Marine litter affecting tourism, environment, and local economy.



## SeaClear Solution

Robotic litter collection maintaining beach and sea clean



## Your Benefits

- **Enhanced Tourism Appeal:** Supports tourism by preserving natural beauty.
- **Community Engagement:** Involves locals in sustainable ocean initiatives.
- **Long-term Environmental Benefit:** Sustains healthy coastal ecosystems.

# Ports and Harbors



## Your issue

Debris accumulation posing risks to shipping and marine life.



## SeaClear Solution

Efficient litter removal ensuring safe harbor operations.



## Your Benefits

- **Operational Efficiency:** Minimizes navigational hazards in port areas.
- **Sustainable Ports:** Contributes to cleaner, eco-friendly port environments.
- **Economic Benefits:** Supports port commerce and local economies.

# Tourism & Hospitality



## Your issue

Litter detracts from the appeal and safety of tourist destinations.



## SeaClear Solution

Preserves scenic beauty and cleanliness of beaches and sea.



## Your Benefits

- **Attraction Maintenance:** Enhances the visual and ecological appeal of tourist spots.
- **Eco-friendly Tourism Promotion:** Aligns with sustainable tourism practices.
- **Economic Growth:** Bolsters tourism industry through cleaner environments.

# Marine Conservation and Research



## Your issue

Threat to marine biodiversity and research opportunities.



## SeaClear Solution

Aids in marine conservation through litter removal.

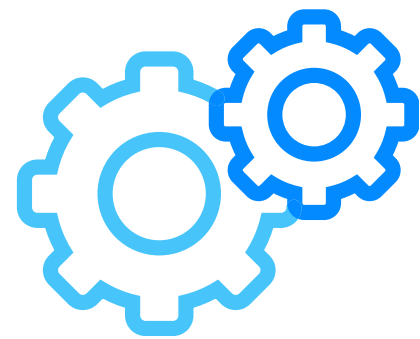


## Your Benefits

- **Research Enhancement:** Offers data and insights for marine studies.
- **Ecosystem Preservation:** Protects habitats and marine species.
- **Sustainable Research Practices:** Promotes eco-conscious research methodologies.

# Technological Readiness

- **Successful Demonstrations:** Field test in recent Hamburg Port (June23), and Lokrum Island (Oct23) operations.
- **Stakeholder Validation:** Positive feedback from EU evaluators and media.
- **Technological Maturity:** Ready for broader application and commercial exploration.
- **Future Development:** SeaClear 2.0.: Scaling up and diversifying applications.



**Successful  
demo**



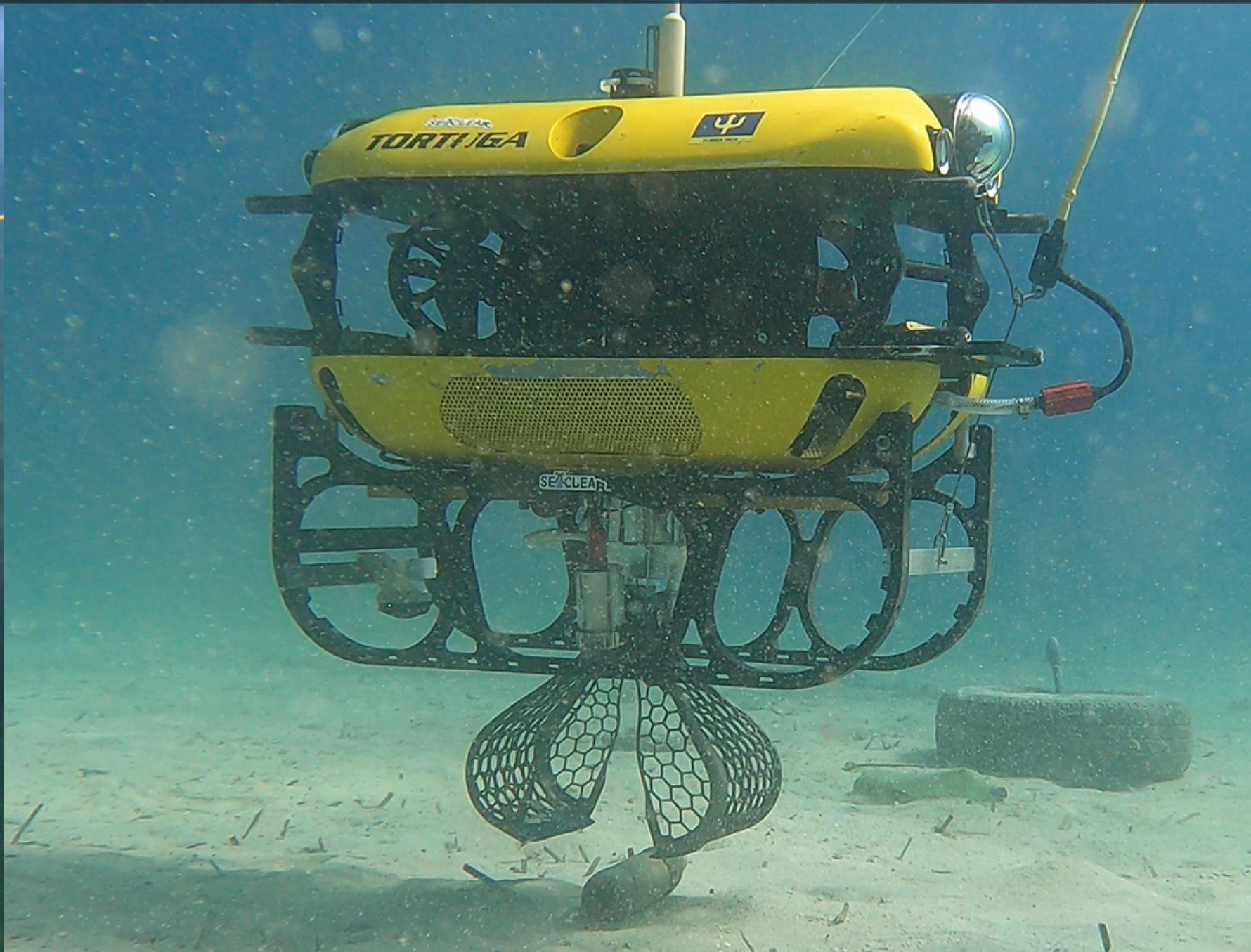
**Stakeholder  
validation**



**Ready for  
development**



# Demo photos





# Technical Specifications

01

**Robotics and AI:** Advanced autonomous robots guided by AI for efficient operation.

02

**Sensing Technologies:** Front-scanning sonar processed by AI for precise litter identification.

03

**Operational Flexibility:** Capable of functioning in diverse water conditions and depths.

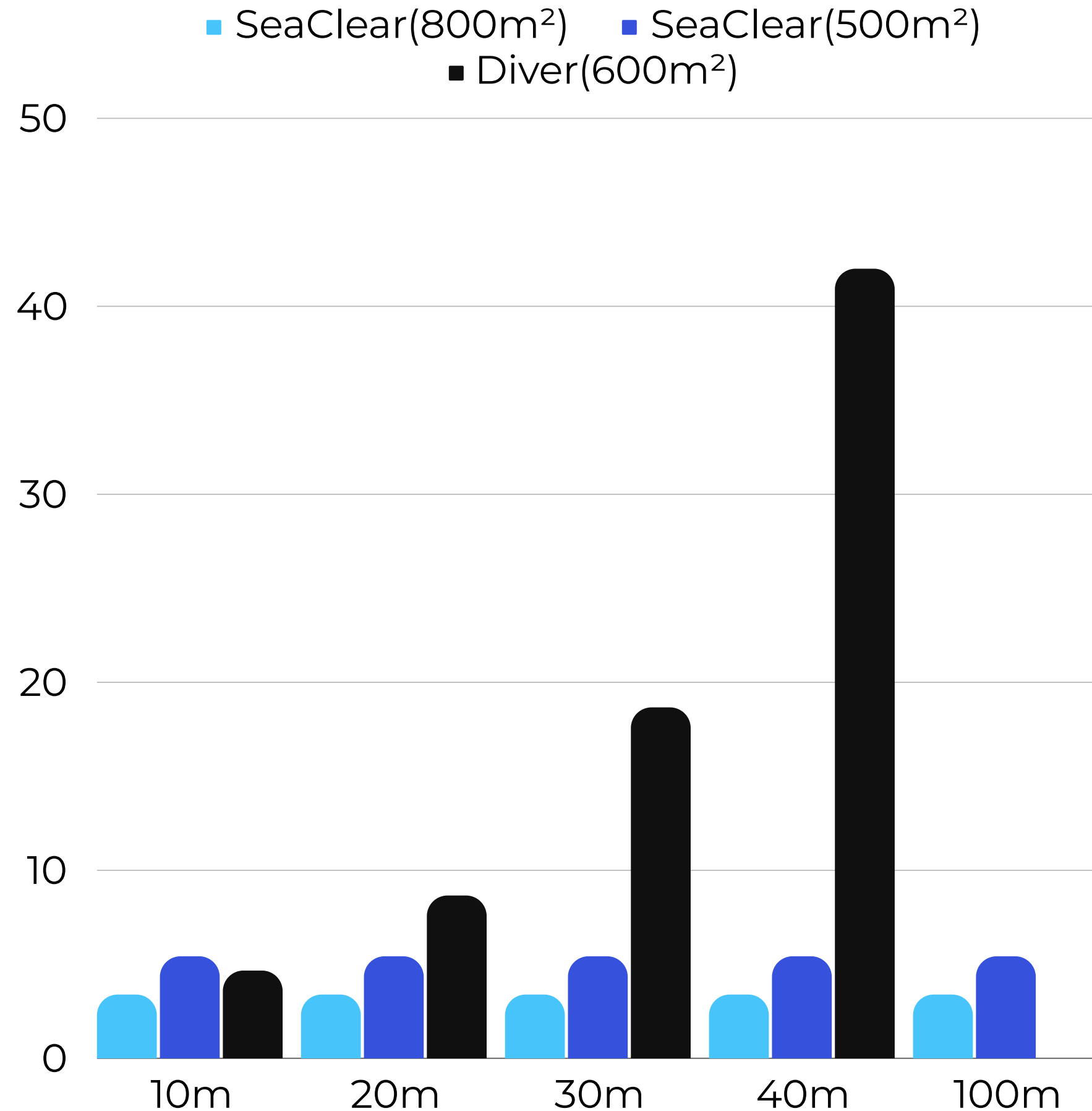
04

**AI for Control:** Advanced algorithms for efficient robot motion planning

# Cost analysis

- SeaClear system costs consistent at all depths
- Diver costs (600m<sup>2</sup> per hour) sharply increase with depth
- SeaClear has economic advantage, especially in deeper waters where diver operations become more expensive

Cost bars are tens of thousands of euro.



# The SeaClear Team



Delft University of Technology



DUNE A



Fraunhofer - CML



Hamburg Port Authority AÖR



Subsea Tech



Technical University of Cluj-Napoca



Technical University of Munich



University of Dubrovnik

# Book a meeting



 [www.seaclear-project.com/meet](http://www.seaclear-project.com/meet)