

Remotely operated Hull-cleaning technologies:



**Università
di Genova**

Reducing GHG emissions and damages to marine biodiversity, an assessment of impacts.

About the project and identifying the problem

This paper will guide the reader on a journey in search of sustainability in the Shipping sector with the description of the new disruptive technologies in Hull Cleaning. **Biofouling is an "invisible" enemy that damages everyone:**

- **Shipowners** that expend a large amount of money for Antifouling paints,
- **Ship operators** that pay an increased bill for the bunker and increased GHG emissions,
- **Local Communities** that have to deal with the negative externalities (e.g. maritime pollution)

Both academic literature and industry reports confirm that an increased level of Hull Roughness leads to an of more than **10% increase in bunker consumption and GHG emissions.**

With these assumptions, we think that the **implementation of a Biofouling Management Plan** is of paramount priority both for the shipping companies to control costs and to be compliant with coming regulations and for the Public Authorities to preserve their local communities.



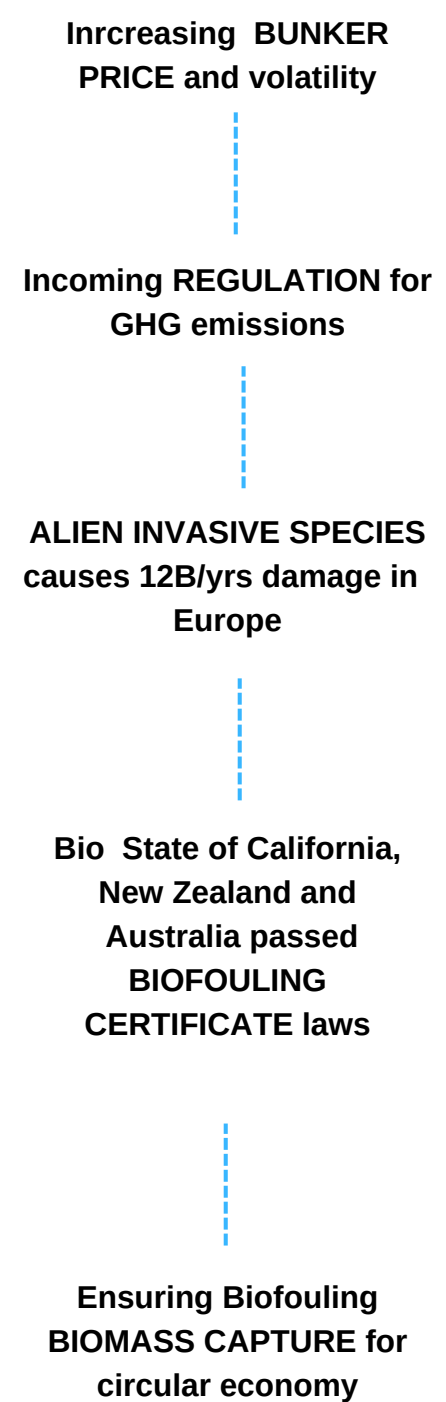
Solution - Remotely operated Hull-Cleaning services

We consider **Remotely Operated In-Water Cleaning** as the best available solution to implement and **exploit the benefits** of future Biofouling Management Plans. The cleaning is delivered via a **Remotely Operated Vehicle (ROV)** that is launched by a land-crew. With the help of vacuum pumps and magnetics, the ROV is attached to the vessel hull, and it is then piloted to remove biofouling and clean the ship. The **main features** of the service are:

- Highly specialized (Value Added Service)
- Mobile and flexible, easily transferable
- Fast, service delivered during vessel's port stay
- Safe and remotely operated
- Ensures biofouling capture
- Via soft jets, not disruptive



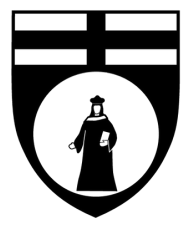
Did you know...



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An implementation strategy

Nowadays these innovative solutions are available only in some area. To exploit the benefits of an extended use of hull cleaning services across the world fleet, the service network HAS to be expanded and SCALED-UP. Thanks to an implementation strategy we developed, we hope we can help the spread of new service centers, and show that the expansion of the service network is not only possible but also very profitable. The PRIMARY TARGET of this service are vessels with high schedule reliability (mainly cruise ships, ferries and RO-RO), in order to ensure high utilization rate of the ROV, then it's important to start operations in a strategic area with high volumes of vessels calls (especially targeted sector) to take advantage of economies of scale. Another crucial topic to assess concerns the legal aspects. Strong knowledge and understanding of local and international regulations is essential for a correct business set-up. Indeed, most ports already have specific procedure for garbage or ballast water treatment as well as areas where emissions are closely monitored (SECA and NECA). Specific norms regarding hull cleaning are common and further developments are "underway".

S

EASILY ACCESSIBLE AND GREAT VALUE FOR MONEY
LOWER BUNKER CONSUMPTION AND GHG EMISSIONS
HIGHER COMMERCIAL SPEED

W

YOUNG MARKET
COMPLEX AND EVOLVING REGULATIONS
SPECIALIZED LABOUR REQUIRED
LOCAL REGULATIONS

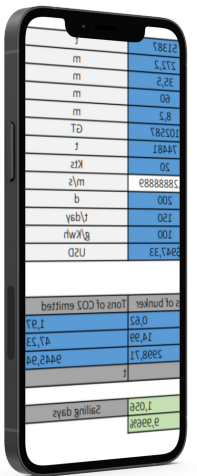
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ADDED VALUE FOR PORTS
ECONOMIES OF SCALES
EXPLORING NEW MARKETS (NAVY)
FIRST MOVER ADVANTAGE
CIRCULAR ECONOMY OF BIO-WASTE
PARTNERSHIP AND JOINT VENTURES WITH PORT FACILITIES

T

HEAVY MACHINE RELIANCE
TECHNOLOGY LEAKS
TECHNICAL OBSOLESCENCE
WASTE MANAGEMENT
CULTURAL CHANGE REQUIRED

A software calculating payback



We consider paramount to show customers full collaboration and visibility, in order to transition from a transactional market to relationship one. To do so, we developed a software that with the help of shipowner inserting their vessel data (LOA, Displacement and usual trading) is able to compute the potential savings they could obtain with the implementation of biofouling management plan and the implied payback period.

The results were incredible, for a medium-sized cruise ship we observed:

- 10% reduction in bunker consumption
- > 10% reduction in GHG emissions
- PBP in less than 1 sailing week

"If you can't measure it, you can't manage it"

Case study - Port of Genoa

High volumes .

Port of Genoa has the largest volume of traffic among Italian ports. Liner and Passenger vessels (primary target customers) make up to 70% of the traffic.

. Strategic position

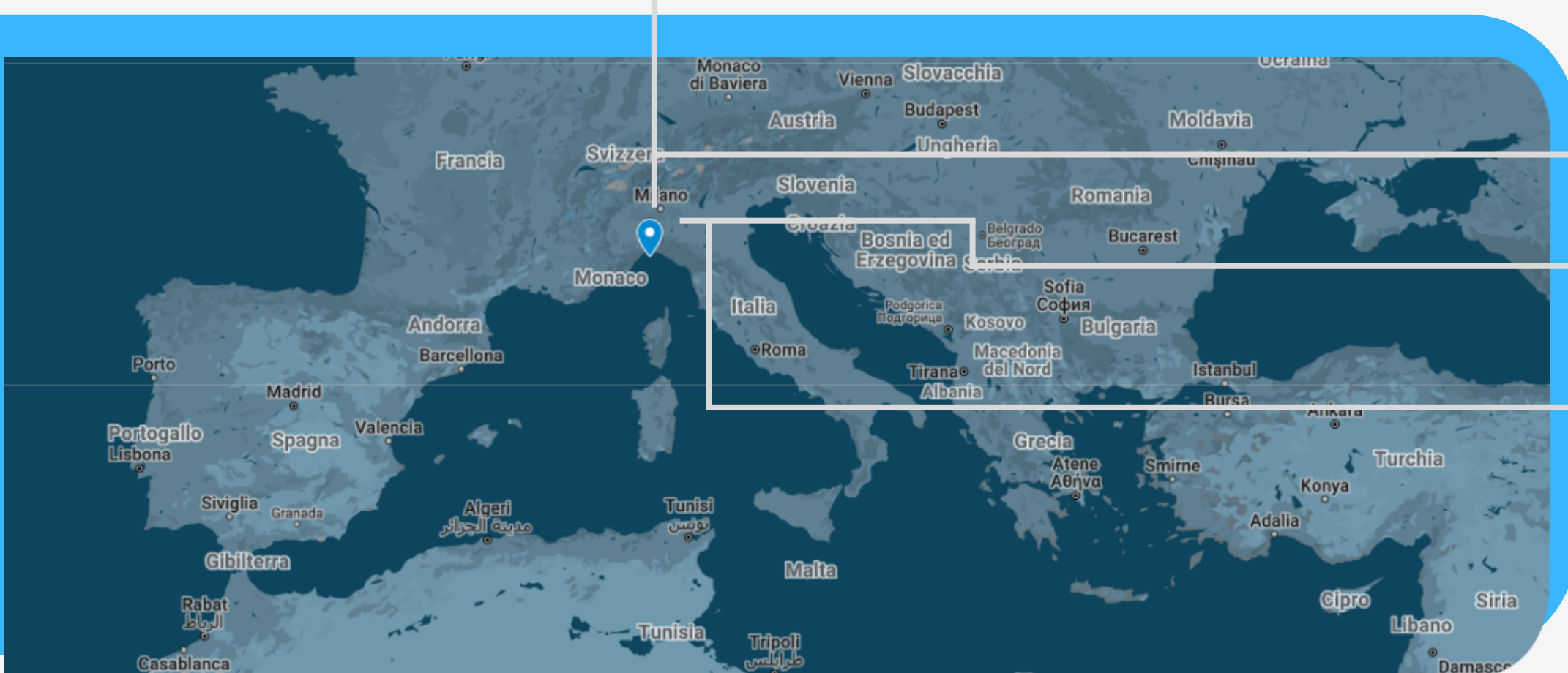
Genoa is a strategic position both to offer and to request the service. It is a crucial point for TEN-T and MOS networks.

. Interconnected

Land transport infrastructures makes ROV easily transportable via road and rail, ensuring the potential to scale the business into land-connected ports.

. Positive externalities

This service could improve the competitiveness of the port of Genoa and its terminals in the Mediterranean Sea and in the world, leading to a win-win situation for all actors in the maritime industry and for the community



GloFouling
PARTNERSHIPS

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