

Bluetech Accelerator

Use Cases Impact Report



May 2020



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Collaboration
is the secret
to navigate across
an uncertain
world.

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1.

Introduction

“Twenty years from now
you will be more
disappointed by the things
that you didn't do than by
the ones you did do. So
throw off the bowlines.
Sail away from the safe
harbour. Catch the trade
winds in your sails.
Explore. Dream. Discover.

H. Jackson Brown

from: *P.S. I Love You: When Mom Wrote, She
Always Saved the Best for Last*

The aim of this report

This report aims to provide detailed insights on the pilot projects that were conducted between the program partners and the selected startups of the first edition of Bluetech Accelerator, and to describe, when possible, the potential impact of the startups solutions in a scenario of full deployment by the acceleration partners.

The eleven startup solutions presented in this document are the finalists of the Bluetech Accelerator program, and they were selected by the program partners and Beta-i among **87 applicants worldwide**. The technological solutions presented in this report include: *online platform for cargo logistics, vessel wing-sail system, AI powered mobile mapping, blockchain for logistics, wave energy power station, hyperlocal weather forecasting, containers (temperature) tracking and monitoring, online management of shipping and*

freight forwarding, earth friendly laser cleaning, and data buoys for water quality monitoring

Within the Bluetech Accelerator program, startups and partners engaged in **18 pilot projects** during a period of five months. The different pilot scopes address most of the challenges identified during the *Needs Assessment* and they are specifically focused on **reducing carbon footprint, decreasing port and shipping operational costs, and improving data security and sharing.**

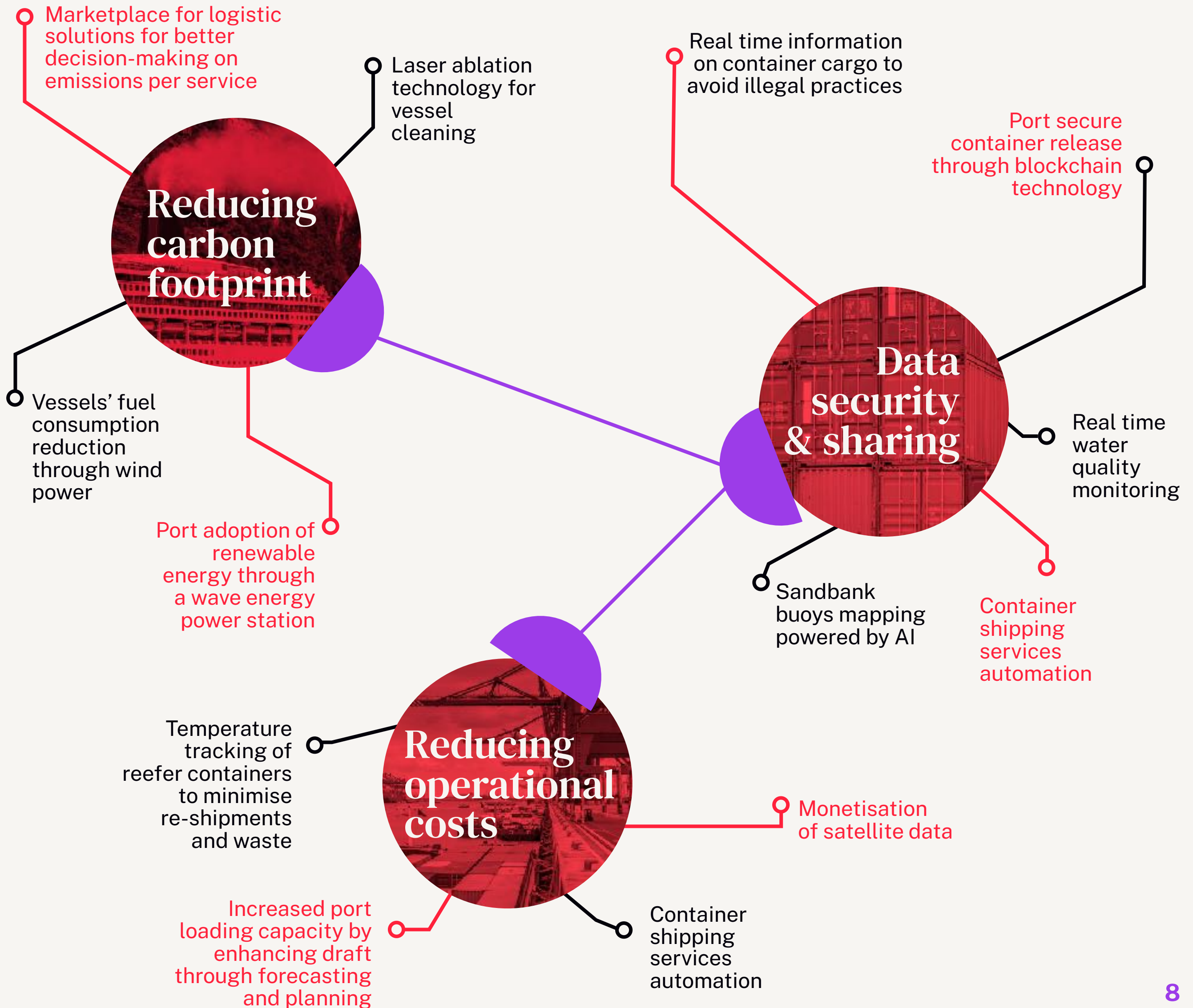
“If we all work together, we believe we can accelerate the digitalisation of the maritime industry, but it will take innovators around the globe to help us do that.

Alison Grey

Senior Director @ Digital Incubation, Inmarsat



Pilots Impact



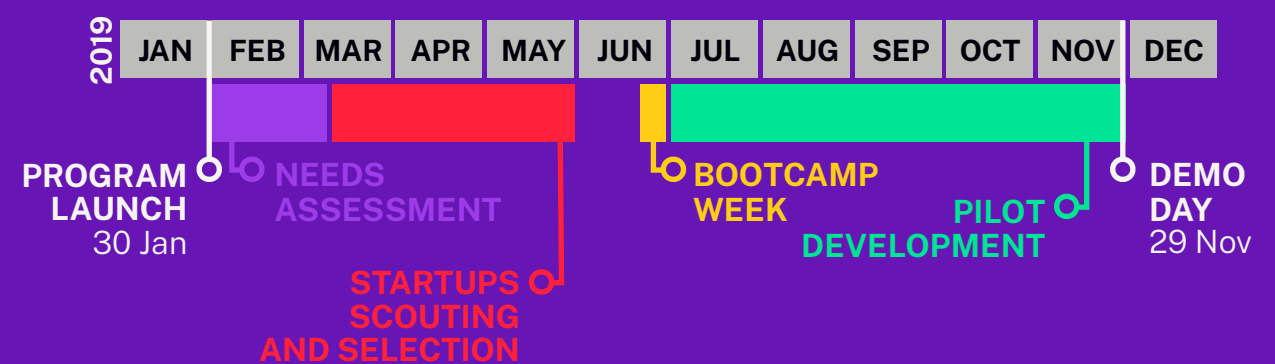
The pilot outcomes, some of which have been showcased during the Bluetech Demo Day on November 29th, in Lisbon, contribute to the mission of the following Sustainable Development Goals (SGDs): 7) *affordable and clean energy*, (8) *decent work and economic growth*, (9) *industry, innovation and infrastructure*, (13) *climate action*, and (14) *life below water*.




About Bluetech

Bluetech Accelerator - Ports and Shipping 4.0 - is a nine-month open innovation program, based in Lisbon, that enables startups worldwide and corporate organizations in the Port & Shipping industry to develop pilot projects that respond to the corporates' innovation challenges. Bluetech Accelerator it's an initiative of the Portuguese Ministry of the Sea, supported by Luso-American Development Foundation (FLAD) and powered by (DGPM) and Beta-i.

Program timeline



Bluetech Accelerator -Ports & Shipping 4.0 counted on the participation of the five acceleration partners: the **Port of Leixões** (in this report addressed as **APDL**), the **Port de Sines** (in this report addressed as **APS**), **Grupo ETE**, **Inmarsat** and **Portline Ocean**.

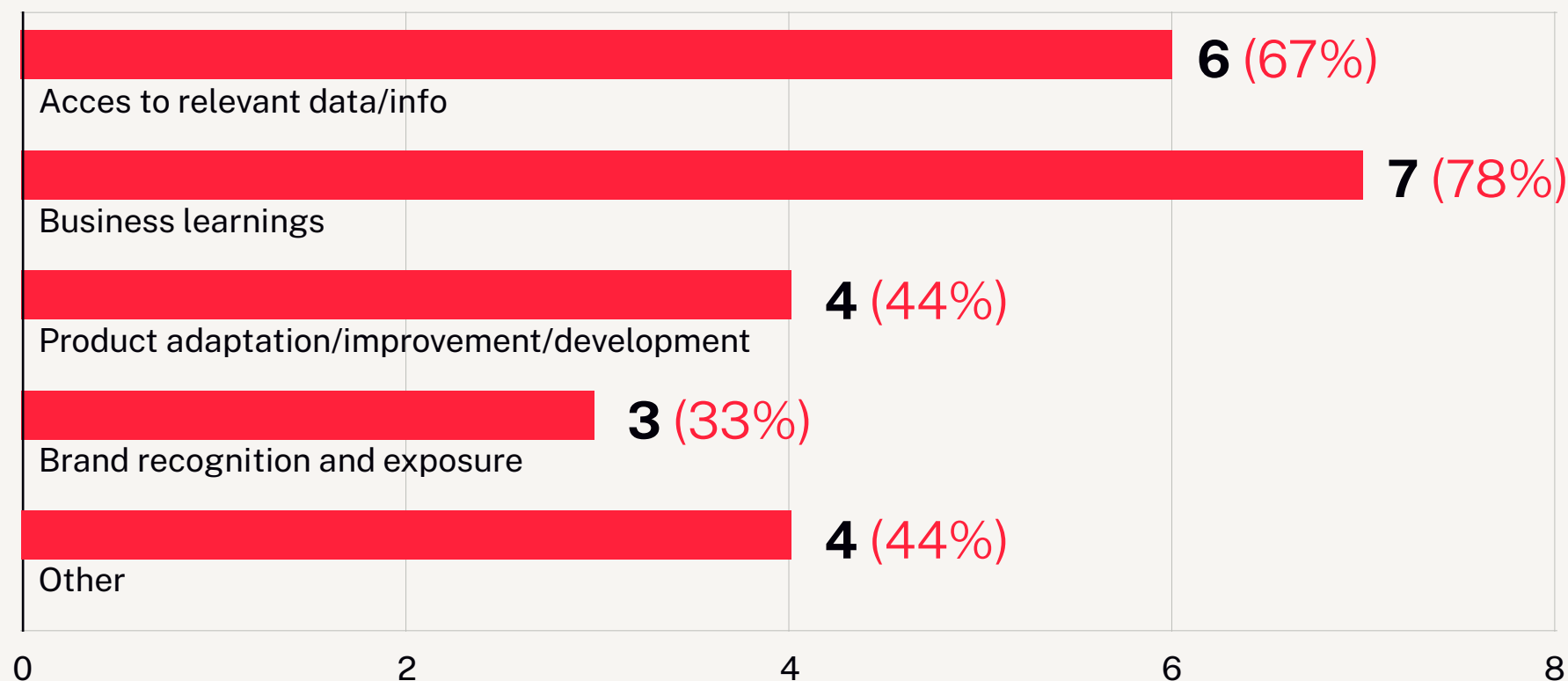


After the Demo Day, most of the Bluetech startups are still collaborating with the program partners, some have established new business agreements and partnerships, others are currently discussing the next steps.

According to a survey conducted among the piloting startups in January 2020, the main takeaways from the piloting phase for the startups were *I) the acquisition of new business learnings* and *II) the access to relevant data or information*.

What did you gain from the pilot(s) specifically ?

9 responses



“The Bluetech Accelerator enables startups to work alongside our stakeholders and find together innovative solutions to the current challenges.

Luís Marinho Dias
Innovation co-Director @APDL



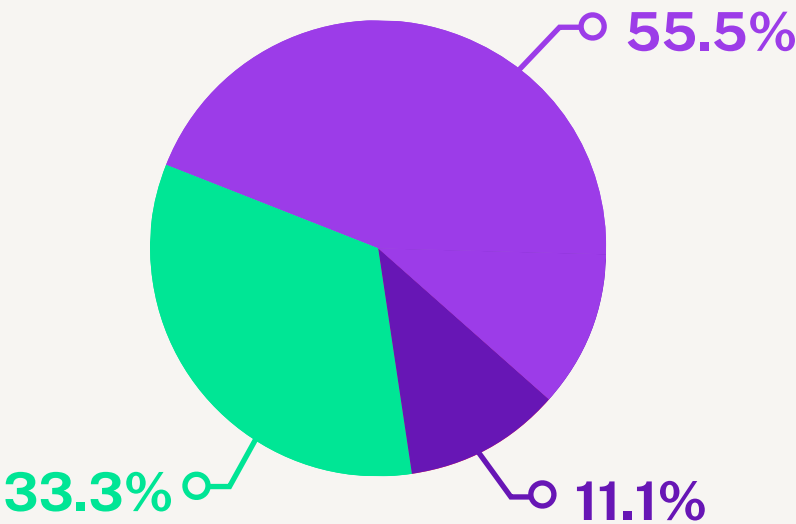
“ We had access to the port data and internal procedures which led us to understand better how to implement and optimise our solution for the ports and other clients.

Bruno Balbi
CEO @i4sea

From the survey it was also highlighted that 4 out of 9 startups **are currently thinking to relocate their business to Portugal,** and 8 out of 9 **are currently seeking funding opportunities.**

Are you thinking of relocating your business in Portugal?

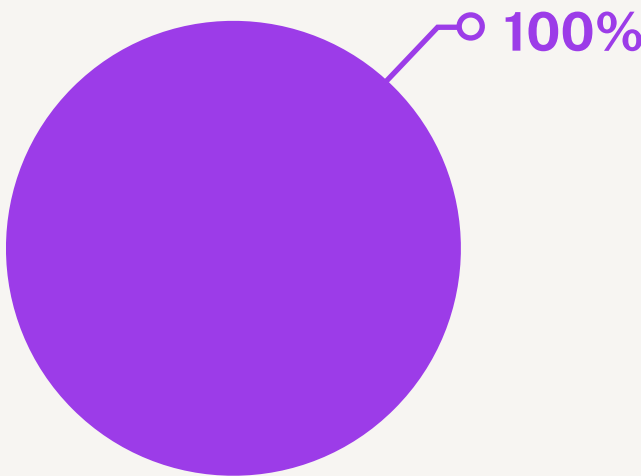
9 responses



- Yes
- No
- I don't know yet

Are you seeking funding opportunities?

9 responses



- Yes
- No
- I don't know yet

In the next pages, the pilot scopes and outcomes of the 18 projects are described, as well as the development of each collaboration between the startups and the program partners of the Bluetech Accelerator.

Disclaimer: All the information used to draw the use cases was provided by the startups and the metrics of impact are to be considered as estimations.

About the Acceleration Partners



The **Port of Leixões** (APDL) is the largest port infrastructure in Northern Portugal and one of the most important in the country, equipped with modern facilities and advanced ship management systems



The **Port de Sines** (APS) is the leading national port in volumes of cargo handled, being also the leading container port in the country



Since 1936, **Grupo ETE** is the national leader in developing competitive services for the port, maritime and inland water transportation sectors



Inmarsat is the pioneer and world leader in mobile satellite communications, powering global connectivity for over four decades.



With a deep focus on the international market, **Portline Ocean** has developed a remarkable expertise in the transport of dry bulks and containers, together with all the related shipping activities

Program Challenges

As a result of the *Needs Assessment* with the acceleration partners, there were defined these program challenges: **Process optimisation in Port Hinterland, Cargo and Fleet Performance Management, Future Shipping Connectivity, and Environmental Sustainability.**

The definition of following challenges was key to attract relevant startups with solutions tackling the innovation needs of the partners.



Process optimization in Port Hinterland

Includes:

Extended gateways, rapid container release operations and efficient land-side intermodal forwarding of loading units. Data analytics for complete vessel situational awareness and real-time information of all critical ships operations and cargo flow. Security profiling illicit activity at sea, operational risk assessment and dynamic pricing insurance.

Cargo and Fleet Performance Management

Includes:

Use of historical data, statistical algorithms and machine learning techniques to avoid port congestions, delays, and other port operational inefficiencies. Use of historical data of vessel geolocation to drive product innovation. Use of digital twins for ports and vessels allowing ports to create testing scenarios and producing valuable insights from data.





Future Shipping Connectivity

Includes:

Enabling ports and cargo to be “connected and linked”. Ship chartering marketplace allowing shipowners, charterers and operators to choose best freight rates according to a placed position and cargo space availability. Voyage optimisation, situational awareness for the fleet operator, real-time scheduling and environmental compliance.

Environmental Sustainability

Includes:

Reducing port environmental footprint and monitoring air, water and noise pollution through smart technologies. Reducing ship air pollution and increasing efficiency of ship-generated waste. Environmental compliance through early detection of potential hazards; offshore infrastructure maintenance, reducing downtime, repair needs, and required inspection.






“We are irreverent in the way we relate to the maritime transport industry. Sharing this concept with startups that have the same philosophy is an opportunity that we definitely cannot miss.

Jorge Fernandes
CEO @ Portline Ocean



Collaboration outcomes

Bluetech startups and partners developed 18 pilot projects during 5 months.

PARTNER	STARTUP					
						
						
						
						
						

The collaboration outcomes are presented in the summary below, and in more in detail, in the following pages.

New business agreements

- ⊗ **Bound4blue** and **Grupo ETE** 's shipyard (Naval Rocha) have signed an MoU affirming Naval Rocha as a bound4blue reference in Portugal.
- ⊗ **i4sea** and **Inmarsat** have established a partnership that sets i4sea as Inmarsat's new certified application provider for Fleet Data.
- ⊗ **Mari One** and **Grupo ETE** have established a new business agreement and they are jointly applying for European grant funding.
- ⊗ **Sevways** and **Grupo ETE** have established a new business agreement and they are collaborating in a new R&D project.
- ⊗ **Eco Wave Power** and **APDL** have signed a concession agreement for a construction of the EWP wave energy array in a scale of up to 20MW.

In progress

- ⊗ **Surclean** and **Grupo ETE** are establishing an agreement together with *Istituto Superior Técnico* (NDA in progress) to present an application for R&D funding.
- ⊗ **Portline Ocean** and **MITMYNID (Bizcargo)** have an agreement to create a joint venture and find other partners to support the idea with the involved investment.
- ⊗ **Grupo ETE** is doing an internal assessment to identify other companies in the Group for which the solution of **MITMYNID (Bizcargo)** would be suitable.

Under consideration

- ⊗ Both the ports of Sines (APS) and Leixões (APDL) are receiving business proposals from **i4sea and T-mining** which are still under consideration.

2.

Use cases

beta*i*

● Bound4blue

Vessels' fuel
consumption
reduction through
wind power



wing-sail
system



vessel



fuel
reduction

⌚ **Piloting partner:**
GRUPO ETE

⌚ **Pilot type:**
Pre-feasibility study

1. Problem/Opportunity definition

Shipping companies are looking for innovative methods to reduce their environmental footprint.

2. Solution

Bound4blue's highly innovative eco-friendly solution brings aviation technology to the shipping industry. Bound4Blue developed a foldable wing-sail solution based on an aeronautical design which reduces fuel use and pollutant emissions of the maritime transport sector by an average of 30%. The generated savings allow payback below 5 years (never reached before), it does not require additional crew and it is completely foldable.

3. Pilot Scope

The pilot with **GRUPO ETE** consisted in a pre-study for potential installation of a wing-sail system in two vessels (Insular vessel and São Jorge vessel) in order to **save fuel and pollutant emissions**.

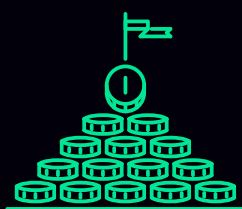
The study on the São Jorge vessel showed bad results due to the amount of time that the vessel has been used and the slow speed at which it sails.

Although the results obtained from the first vessel, Insular, are very positive (showing an economic savings of 140.000€ - 210.000€ per year), Grupo ETE has chosen not to proceed with this vessel due to a strategic decision. They agreed on finding another vessel of their fleet to install the technology and propose this solution to other vessels in their market. GRUPO ETE's shipyard (Naval Rocha) and bound4blue have signed the MoU. **This agreement includes collaboration in R&D projects, in technical or commercial development of the project, and diffusion tasks. Additionally, the agreement affirms Grupo ETE's shipyard as a bound4blue reference in Portugal. GRUPO ETE's shipyards are ready to install bound4blue technology on any ship suitable for this technology.** Also, the partner is studying the possibility to install bound4blue on the new ships in Cabo Verde in the next few years.



GRUPO ETE's shipyard (Naval Rocha) and bound4blue have signed the MoU.

4. Impact



Costs savings

economic savings of

140.000€ to 210.000€

per year



Fuel consumption reduction

The reduction of

**2,034
Ton of CO2**

emissions per year
(equivalent to 538
diesel cars).



Fuel consumption reduction

The reduction of

640 TON
of fuel per year

translating in a
decrease of

384.000€

per year

“We want to connect with players that own new ways to approach this sector, and that can bring know-how and efficiency in the industry.”

Andreia Ventura
Grupo ETE



“Before joining the program our customers were only Spanish shipowners. Being able to pilot a project with a Portuguese shipowner has given us the introduction to the Portuguese market.

Cristina Aleixendri

Co-founder and COO @bound4blue

● Geckomatics

Sandbank buoys mapping powered by AI



AI based
mobile
mapping



geospatial
information



mini
buoys



asset
inventory

⊗ **Piloting partner:**
APDL

⊗ **Pilot type:**
Implementation plan

1. Problem/Opportunity definition

APDL is interested in tracking missing objects on the river such as buoys. Tracking specific solutions are not easy to implement and could be very expensive, as in the case of the solution of adding sensors in each buoy.

2. Solution

Geckomatics develops AI based mobile mapping systems, enabling organisations to create and update their geospatial information with unprecedented ease. Our in-house designed smart mobile camera system integrates seamlessly with our cloud platform where Artificial Intelligence does the heavy duties like object recognition and accurate positioning. Because of its low barrier to use, both in terms of TOC and usability, keeping actionable geospatial data up-to-date has never been so achievable.

3. Pilot Scope

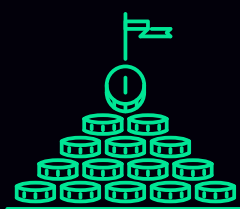
The pilot consisted in mapping the buoys that mark the sand banks in the river Douro through the installation Geckomatics' mobile camera system on a river cruise ship. Geckomatics's Artificial Intelligence identified the buoys and provided a precise position on a digital map. Whenever one buoy is missing, the Port receives a notification that enables them to take appropriate action.

When the river buoys are going to be mapped next time, the system will detect if all the buoys are still in their location. Timely maintenance of the buoys can prevent expensive damage or even accidents.



Whenever one buoy is missing, the Port receives a notification that enables them to take appropriate action.

4. Impact

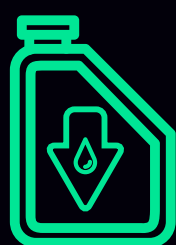


Costs Savings, improved operations and job creation

If detecting missing buoys can prevent accidents there will be a huge cost saving, in economic terms but also in

SOCIETAL AND ECOLOGICAL

terms. The system can be deployed for other uses as well like other asset management in the port.

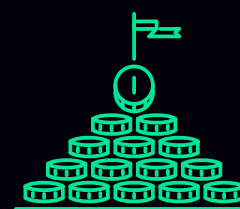


Reduction of fuel consumption and damage prevention

This kind of solution

LOWERS THE NEED FOR INSPECTION TRIPS, SAVING FUEL.

Also, if accidents are prevented that obviously would prevent debris and spillage in the river.



Costs Savings, improved operations and job creation

DIGITISING ASSET INVENTORY

and management would be a great step towards

MODERNISING INFRASTRUCTUR E AND BUSINESS PROCESSES.

Also, in the future this technology can enable the creation of **digital twins**, offering a full 3D model that will not only enable assessment of current situations but also simulation of different scenarios of port development. This will support decision making and execution. Digitising business processes is very likely to create high value adding jobs in the digital economy.



“Partners such as APDL help us improve our product because we both learn from using it. It also is a nice reference case for us. The main benefit we get out of this customer is that it gives us leverage on many levels: exposure and credibility, as well as product development and enhancement. Our technology can be used in many industries, but we are currently mainly focusing on Smart Cities and road authorities. Ports are a particular industry and we believe Portugal is a good option given its reputation and expertise in the Blue Economy.

Bert Cattoor
CEO @Geckomatics

● Eco Wave Power

Reduced
environmental
footprint through
wave energy



ports



clean
electricity



wave
energy

⊗ **Piloting partner:**
APS, APDL

⊗ **Pilot type:**
Pre-feasibility study

1. Problem/Opportunity definition

In the end of 2017, the Portugal Government adopted an ocean energy buildout plan and approved an industrial strategy to accelerate the development of its ocean renewable energy sector. Portugal's Industrial Strategy for Ocean Renewable Energies (EI-ERO) established guidelines for the use of renewable energy obtained through infrastructures installed or to be installed in coastal zones and in the ocean. The major strategic objective is the creation of a competitive and innovative industrial export cluster for ocean renewable energies, wave energy.

In this context, the government of Portugal based its EI-ERO around two main goals: 1) stimulate export and value added investment and to assist industry in reducing risks; B) contribute to the realization of Port Tech Clusters which suggests the development of ocean renewable energies could be accelerated by creating synergies with the naval sector which could open access for the industry to the demonstration sites in real operating environments near ports.

When it comes to wave energy, the government of Portugal estimated that there is a potential to install 3-4GW of wave power capacity. As a result, the implementation of the Eco Wave Power technology in commercial scale, in the relevant ports in Portugal, assists the ports in meeting the government's renewable energy strategy.

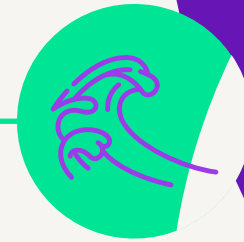
2. Solution

Eco Wave Power has developed a smart and reliable technology for turning ocean and sea waves into clean electricity. The company already has a working wave energy power station in Gibraltar, operational smoothly [since 2016](#). It is the only wave energy power station in the world, to transmit electricity to the grid, through an official PPA (Power Purchase Agreement).

3. Pilot Scope

In the pilot projects, Eco Wave Power conducted official site visits in the Port of Sines and the Port of Leixões, and found a number of potential sites which are deemed highly compatible for the implementation of the technology.

In parallel to the site visits, Eco Wave Power's engineering team performed detailed pre-feasibility studies, in which it examined the available marine structures in the proposed sites and examined and analyzed the wave height and period in the proposed locations. According to such initial visits and studies, both ports were deemed compatible for the implementation of the Eco Wave Power technology. As a result, Eco Wave Power proposed to move forward with the collaboration, by entering concession agreements with both ports. In late April, Eco Wave Power and APDL have signed a Concession Agreement regarding the usage of an area potentially suitable for the construction, operation and maintenance of a wave energy power plant of up to 20MW in four locations owned and operated by APDL.



Eco Wave Power and APDL have signed a Concession Agreement regarding the usage of an area potentially suitable for the construction, operation and maintenance of a wave energy power plant of up to 20MW in four locations owned and operated by APDL.

4. Impact



Reduction of port carbon footprint

Ports are known to be a significant source of carbon emissions, mostly due to the shipping industry. By installing Eco Wave Power’s clean energy wave technology, the port will obtain a technological solution to

**DRASTICALLY
REDUCE ITS
CARBON
FOOTPRINT.**

The port will help the environment,

**FIGHT CLIMATE
CHANGE,**

and assist in making the transition to a

**CLEAN ENERGY
FUTURE**

possible. The table below shows an estimate of the expected annual Co2 emission reduction per Port.

Power Station	Expected Annual Co2 Emissions Reduction (Metric Tons)
5MW Port of Leixões	13,000
4.5MW Port of Sines	7,900

¹ Provided a capacity factor of 28.4% for the Port of Sines and 42% for the Port of Leixões.

4. Impact



Promotion of Eco-Tourism

The implementation of EWP's solution will promote Ecotourism to the ports, as it will portray the ports as pioneers in the wave energy field. Thus, making it a true – Green Port. One of the goals of Eco-Tourism is to offer tourists insights into the

**IMPACT OF
HUMAN BEINGS
ON THE
ENVIRONMENT,**

and to foster a greater appreciation of human natural habitats.



Value and jobs creation

Ocean renewable energies have the potential to supply 25% of Portugal's annual power consumption, while the sector could generate €254 million in investment, €280 million in gross value added, €119 million in trade and

**1,500
NEW JOBS**

(as stated by the Government of Portugal).

4. Impact



Minimization of coastal and breakwater erosion

Eco Wave Power's floaters will assist in

MINIMISING A PHENOMENON KNOWN AS "COASTAL AND BREAKWATER EROSION".

When oncoming waves hit the maritime structure, (e.g. the breakwater, pier, jetty etc.) the wave's impact is concentrated on the structure, which in return is exposed to the oceans erosive power, thus shortening the life span of the structure and causing large scale expenses for its renovation.

Once Eco Wave Power's devices are installed on the ocean structures, the erosive ocean effects will be minimised, as the uniquely shaped floaters will serve as shock absorbers, and absorb some of the destructive energy, thereby extending the breakwater's lifespan.



“We are very grateful for the productive collaboration with the Bluetech Accelerator and the ports that have passionately collaborated with Eco Wave Power during the pilot phase of the program. Without their support and assistance, the progress achieved by Eco Wave Power would not have been possible. We are very excited about bringing our unique technology to Portugal, which has one of the most significant wave resources in the world! We are pioneering a new sector and are truly making a change!

Matias Sigal

Business Development @EWP

● I4sea

Increasing ports loading capacity & monetisation of satellite data



hyperlocal
weather
forecasts



software



draft



dredging

⊗ **Piloting partner:**

APS, APDL,
Inmarsat

⊗ **Pilot type:**

Implementation plan

1. Problem/Opportunity definition

The water depth limitations of the Port of Leixões limits the maximum vessel sizes entering the port, the loading capacities and the general operations. i4sea aims to enhance the maximum draft by using forecasting and planning software, therefore increasing the loading capacities and availability for vessel operations in the port.

The Port of Sines needs to anticipate waves of a certain height and direction, to better manage the risk of having an accident during the stay of the ships at the berths.

Inmarsat has available an IoT solution that collects vessel data and needs third parties to provide relevant analytics and insights for their clients.

2. Solution

i4sea developed a marine intelligence software (i4cast®) which provides 7-day under-keel clearance forecasts and optimal windows for vessel maneuvers through intuitive web and mobile interfaces.

3. Pilot Scope

The pilot with APDL consisted in customising the i4cast® software (web and mobile) to provide precise information about draft with 7 days in advance, to support decision making and enhance loading capacities and operational safety. In parallel a case study was developed to showcase the value of applying the dynamic draft approach for APDL's operations.

The pilot with APS, consisted in developing a case study to showcase the value of applying a hyperlocal waves forecast to support decision making about the safety of vessel stay in the terminal and docking/undocking manoeuvres.

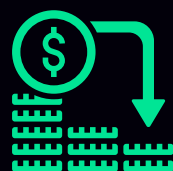
Inmarsat and i4sea signed an agreement to allow i4sea to join Inmarsat's fast-growing group of certified application providers for Fleet Data. i4sea will provide a high-precision sea and weather forecasting application with up to seven days forecasting in advance through i4cast®'s Atm Ocean® tool for Fleet Data, the maritime industry's first secure IoT platform which extracts data from sensors and uploads it to a secure central cloud-based database for easy access with no additional airtime cost.

The goal of this pilot was to use key information from Fleet Data in order to improve some functionalities of i4cast®, by: (i) optimising the calibration of i4sea vessel motion models (PRIME-UKC) within port areas; (ii) feeding the product version for ship owners (PORT-FLOW) with real-time AIS information. Inmarsat's Fleet Data was tested with two ships of unknown identity to analyse the extracted data. This phase demonstrated the potential of combining Fleet Data with the ship operating windows offered by i4cast.



Inmarsat and i4sea signed an agreement to allow i4sea to join Inmarsat's fast-growing group of certified application providers for Fleet Data.

4. Impact



Additional revenue and costs savings

Being able to use i4cast®'s dynamic draft approach APDL registered a potential increase of

0,9M IN DRAFT,
THAT WOULD
REPRESENT ADDITIONAL
720 TEUS/SHIP

(for APDL that would represent an additional revenue of € 2.000.000,00).

Also, an additional 0,9m in draft implies a 6,6x increase in berth availability for some important vessels that operate in APDL and APS. The cost of a dredging operation of 0,9m would be roughly € 100.000.000,00.



Additional revenue and costs savings

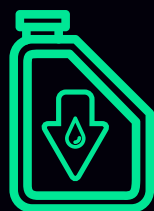
By using i4cast®, APS registered that 19 port operations that were affected by adverse wave conditions in one quarter, could have been avoided by using i4sea's forecasts.

The financial impact is estimated to be

€144.000,00
/SHIP in cost savings
(19 days).

The current losses correspond to €2.736.000,00 in one quarter (2019).

4. Impact



Time savings and fuel consumption reduction

By having more availability to operate, the vessels will spend less time waiting, which saves fuel and therefore less CO2 being emitted to the atmosphere. By gaining more draft, the ports have a reduced need to dredge, a very impactful project for the environment. Finally, bigger vessels have the ability to transport more cargo with less voyages,

CONTRIBUTING TO THE OVERALL COSTS AND INCREASING THE SUSTAINABILITY INDEXES OF THE MARITIME SECTOR.



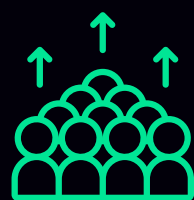
Time savings and fuel consumption reduction

By delivering more precise ETAs (Estimated Time of Arrivals) and ETDs (Estimated Time of Departures), the joint solution has the potential of

OPTIMISING THE FUEL USAGE AND REDUCING CO2 EMISSIONS,

as the vessels will be able to decide which speed to deploy considering that now they know exactly what time they can arrive/departure without waiting.

4. Impact



Market reach

Inmarsat's customers will get complete access to precise weather and ocean information and add intelligence to their vessel data collected by Inmarsat's Fleet Data. They will be able to coordinate arrivals and operations better with port authorities and terminals.



Network Effect and Increased efficiency

By having more draft,

**THE OVERALL
LOGISTIC COSTS
WOULD DECREASE
AS A WHOLE.**


With less waiting times in the ports, more vessels would be able to operate, contributing to the overall efficiency of the sector.

“We want innovators to play with our fantastic range of products, some already existing, some in the making and work together to deploy and create new connected digital solutions for the maritime industry.”

Clara Wahnich

Digital Innovation Partnership Lead
@ Digital Incubation, Inmarsat



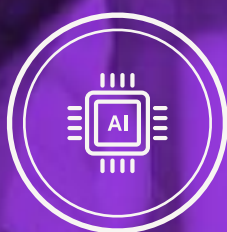
A black and white portrait of Bruno Balbi, a man with dark hair and a beard, smiling. The background is slightly blurred, showing some text like 'CREATOR' and 'CREATION'. A large green semi-circle is overlaid on the right side of the image, containing the quote. A white semi-circle is overlaid on the bottom left of the green area.

“ Having access to the right people helped us to have a shorter sales cycle, especially when working with international clients. Being able to work along APDL during the pilot gave us a complete understanding of the Portuguese maritime sector, its needs and pain points. Now we have developed a useful and valuable tool for them. Having an international project helped us to gain more credibility and brand value when prospecting new clients in Brazil and abroad. We were also invited to participate in various acceleration programs in the world because of the awareness created by the Bluetech Program.

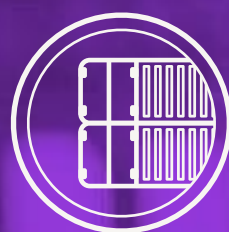
Bruno Balbi
CEO @i4SEA

● Mari One

Temperature tracking and alert system of reefer containers



AI
sensors



reefer
containers



perishable
goods



temperature
tracking

⊗ **Piloting partner:**
GRUPO ETE

⊗ **Pilot type:**
Implementation plan

1. Problem/Opportunity definition

Temperature tracking and alert system of reefer containers

The global maritime sector hosts shipping companies delivering cargo across our oceans which in turn increases carbon emission daily. The reality within those shipping vessel reefers or containers can be 100% full or partly full. Furthermore if the reefers breakdown the cargo inside is perished and needs to be re-shipped which doubles the carbon footprint than originally intended. Full reefer units being shipped is more cost effective than reefers being shipped partly full or temporarily breaking down.

Maritime transport logistic operators need to track the temperature of reefers at sea or in port on a regular basis, whose process is usually done manually and in absence of real time information or automatic alert mechanism.

2. Solution

MARI-ONE remote sensing solution is a software/hardware technology that creates a real-time alert and instant reports for perishable goods in reefer containers when in transit. A small magnetic box is attached to the reefer during loading that has its own independent power supply, so should the container fail or fall out of the cargo parameters then the crew are alerted instantly, replacing the need for time-intensive manual recording.

3. Pilot Scope

This pilot aimed to digitally transform the way Grupo ETE manages the monitoring of the reefer units on land first then at sea. The pilot consisted in tracking with AI sensors the internal temperature of Transinsular Reefers in transit from Lisbon to Açores and Madeira. This project allowed for the technology to be implemented in an active live environment, on board a vessel provided by Transinsular.

The pilot showed that by using the temperature sensors and AI software, Grupo ETE is able to monitor any faults or breakdowns in the Reefer container units they managed everyday. Currently this process is managed by visual observation by key operations staff every 12 hours. The outputs of the tracking solution is a real time data transfer alerting the operations management team to action if a reefer breaks-down. This is important as the products being shipped in the Reefer container are temperature sensitive and if spoiled cannot be invoiced.

The data collected are stored in the cloud and accessed by key stakeholders using a password. The pilot proved that the refrigeration containers used daily in shipping can be tracked using intelligent AI technologies to measure any change in temperature across the journey from port to export destinations.

Grupo ETE and Mari-One are now preparing commercial discussions to explore the application for the Portuguese market. The Mari-One team is working on an extension of the solution by adding new features and requests highlighted from Transinsular during the pilot phase.

The completion of this pilot in itself alone has attracted a significant investment interest by relevant players in the United Arab Emirates, Germany , Singapore and more recently Spain.



the refrigeration containers used daily in shipping can be tracked using intelligent AI technologies to measure any change in temperature

4. Impact



Improved Operational Efficiencies

The Partner will be able to

REDUCE ITS OPERATIONAL COSTS IN RELATION TO MAINTENANCE AND REPAIR

of reefers by responding more quickly. By doing so the risk of cargo of the reefers are less likely to be perished in transit with the avoidance of a lengthy breakdown; thus eliminating claims.



Carbon Footprint Reduction

Mari-One helps

MINIMISE THE RE-SHIPMENTS ON TEMPERATURE SENSITIVE CARGO

thus eliminating the need for extra fuel consumption and transport costs. Shipping Reefers that are not functioning at optimum translates into wasted fuel and perished goods in transit leads to more wastage into our oceans. These are two specific effects that we are trying to fight through to our tracking solution.

4. Impact

MARI-ONE provides integrated data that points out alerts to action for the port operator hosting the reefers before sailing to modify or check a key asset in transit which bring a huge benefit and also for the shipping companies who then deliver to the customer via all major ports.



Time savings

MARI-ONE reduces the time taken to record changes in temperature from every

**12 HOURS TO
EVERY
10
SECONDS.**



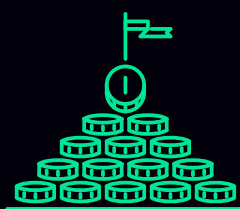
Job creation

MARI-ONE will invest in

**HIRING HIGH
SKILLED TALENTS
IN THE
PORTUGUESE
MARKET**

specifically software engineers for the specific development of add ons and language specific solutions are a fundamental requirement; also talents in the areas of business administration, marketing and client management would be required.

4. Impact



Costs savings


Having a record of key variables of the temperature of cargo is mission critical for the supplier of the goods, the shipping agents, insurers, transport/logistics and buyers receiving the goods at the end port destination. Multiple sensor based alerts can be accessed by any member of the ecosystem and saves considerable costs if reefers are maintained and shipped correctly and the temperature is controlled consistently. If something goes wrong with the temperature settings of the reefer the consequential costs are significant for any ship operator. For example we know that industry shipping rates similar to the distances between Lisbon and Madeira round trip could run into the region of 100,000 Euros. If this trip has to be repeated due to perished cargo having to be re-shipped the agents then have the cost of another round trip plus insurance claims for cargo perished in transit.

THIS SOLUTION CAN
EASILY PROVIDE
ANNUAL SAVINGS
UP TO
€500.000
OR MORE.

For larger vessels travelling to multiple ports and longer distances the savings are monumental for larger operators, running into millions of euros. Also with the addition of a

LOCATIONAL SPECIFIC SENSOR,

the shipping company can locate and identify a more comprehensive asset register of its reefers which can value anywhere up to 20,000 euros per reefer. Rental reefers can be tracked and recorded for on and off hire so no additional increased rates can be charged as each location of reefer is visible using smart devices to track.



“The pilot has opened up key investment opportunities. However the market is global and a key objective is to collaborate with the Portuguese ocean Ministries to assist us to navigate the early stage product specific extensions for Portugal. It is our belief that, spearheaded from Portugal, the implications for long term growth after successfully completing a beachhead strategy, we can accelerate the offering to other key markets from a base in Portugal. We believe the historic legacy of Portugal's distinctive capabilities as a seafarer nation places it in prime position to capitalise as a frontrunner in the blue tech economy race. We want to align to this opportunity and be at the forefront of technology development for the maritime sector with a host nation that understands the market but even more importantly the global opportunity and social responsibility to do so.

Annette MacDougall
CEO @MARI-ONE



Marketplace for logistic solutions to enable better decision-making



market-
place



logistics
and
transport
solutions



track
and
trace

⊗ Piloting partner:

Grupo ETE, Portline
Ocean, APDL

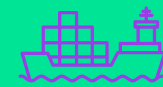
⊗ Pilot type:

Implementation
and integration plan

1. Problem/Opportunity definition

Logistics services clients (industry and trade, import/export) expect to get quotes from different providers for transport services, to ensure the best procurement process. Some carriers have started using digital tools to keep up with the market's needs. However, these are only a few. It is hard to compare different solutions and there is a lack of centralized information in one port. It is known that traffic on roads (with too many trucks) significantly reduces the quality of life for citizens and contributes to increasing the carbon footprint. This could be changed by moving cargo from road to intermodal solutions and combining roads with shortsea shipping or rail transport. Unfortunately, it's not easy for shippers (industry and trade) to find the right services and combinations (co-modal services), and because of that, they prefer to continue using only road services.

Logistics Services Providers (freight forwarders, shipping companies, transportation companies/ carriers, shipping agents, terminals, customs brokers, bank agencies, insurance agents) spend too many resources to develop their business and show low productivity by having non-optimized processes. Information is not provided to clients timely and digitization is not yet practice. The interactions with clients is based on phone calls and emails. Documentation management is based on paper or in scanned documents, not electronic documents. Too many opportunities are lost every day due to low productivity per person. Information about track and trace is hard to obtain and there is no integration between players (providers, clients, authorities, etc.) increasing the number of errors.



moving cargo from road to intermodal solutions and combining roads with shortsea shipping or rail transport

2. Solution

BIZCARGO is a Future Cargo Logistics solution, acting as a marketplace, to search and compare transport and logistics services with simple or multi-modal door-to-door solutions. With intelligent algorithms, we combine services and produce new smart solutions enhancing the lowest values of carbon footprint and contributing eco-value. Thanks to Bizcargo, exporters and importers are able to find, plan, and contract logistics services without the need for intermediaries and the documentation follows the once-only principle and the digital twin, meaning that information is filled only once and can be used to issue several documents.

3. Pilot Scope

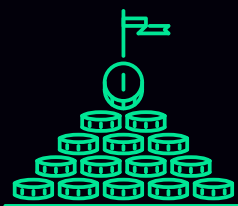
In the pilot with APDL, the IT challenge consisted of addressing extended gateways (by road) in Leixões and Public Open Data exchanging information between APDL systems, Bizcargo and mobile apps. The goal of the pilot was to promote Bizacargo Logistic Services through the Port of Leixões in the hinterland. APDL and Bizcargo would promote one dissemination action with the main stakeholders of Leixões (Carriers,

Agents and Shippers) to adopt Bizcargo and to start working online taking advantage of the available features and integrations using the interoperability software Bizhubs.

Grupo ETE tested the adoption of Bizcargo within the companies of the group and digitised the business between one of the companies in Portugal and the company in Mozambique. By using Bizcargo, Grupo ETE wishes to stimulate digital collaboration inside the group and increase the service level for clients.

The pilot with Portline Ocean consisted in defining a new concept of negotiation in the Bulk Cargo business and disruptive tools to support the business activities. More than mockups, for a new and disruptive tool to manage the Bulk Cargo business, it was possible to create an MVP to prove the concept in the bulk cargo business and to start filling the digital gap between the logistics clients and Portline Ocean. This concept would generate great savings in the process by applying a general digital transformation but also creating sustainable practices in the market.

4. Impact



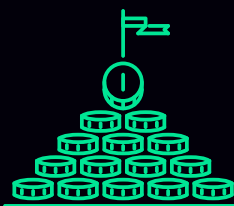
Reduction of operational costs

The solution minimizes the impact of breakdowns and reduces operational costs (considering the stakeholders engagement and networking data sharing in the real-time assignment of tasks and responsibilities).

The solution has the potential of reducing shipment costs of the goods and increasing GDP up to

70%

By using BIZCARGO companies will also increase time savings up to 60% by freeing employees for tasks dedicated to business growth and service improvement.



Costs Savings, improved operations and job creation

The solution has the potential to reduce the carbon footprint down to

40%

by supporting the client's decision with info of emissions per service and creating a positive incentive for those who choose the most efficient and eco friendly services.



Increased efficiency

The solution contributes to increasing providers' efficiency by

30%

greatly reducing errors and tasks without added value.

“The Bluetech Program helped us increase our market exposure and have the opportunity to develop pilots with three relevant companies, focusing different perspectives for a common problem. New business opportunities arrived on our horizon as a natural consequence of the work done, having the seal of success in Bluetech and being able to create connections with other startups.

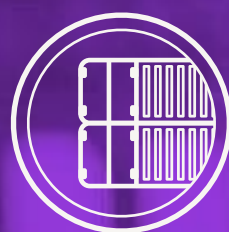
Rui Barros
CEO @Bizcargo

● Sensefinity

Reduced
environmental
footprint through
wave energy



sensors



maritime
containers



real-time
tracking



cloud
monitoring

⊗ **Piloting partner:**
GRUPO ETE

⊗ **Pilot type:**
Implementation plan

1. Problem/Opportunity definition

Grupo ETE moves maritime containers between Portugal mainland and the Portuguese Islands. Once in land it is very important to know the location of such containers and to avoid problems like unauthorized access to cargo (stealing, tampering or smuggling) and food spoiling. More information about the containers will also enable to optimize routes (less travelling, less CO2) and locate containers not being utilized, increasing efficiency.

2. Solution

Sensefinity offers global tracking and monitoring; indoor real-time location system and cloud integrated sensors. Sensefinity's sensors are able to collect information from assets such as temperature, humidity, air pressure, shock, movement, and location. This information is then processed by an Intelligent Cloud that notifies stakeholders, via an alarm, if something is not right. Sensefinity is also able to identify operational patterns that will allow businesses to improve their operations and increase profits while reducing waste and being more sustainable.

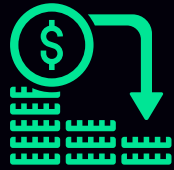
3. Pilot Scope

Sensefinity installed a GPS and GSM tracker on a "dry" maritime container and a Door Close/Open Sensor in the same maritime container. By doing that, it was possible to see the location and the state of the door in a web application. The Bluetech pilot with the Grupo ETE helped Sensefinity to identify exactly the operational issues to be tackled and what KPIs were important. By optimizing routes, refrigeration parameters and access control of maritime containers, it's possible to spend less time traveling, reducing CO2, saving food and ensuring safety by monitoring unauthorized container access (stealing, tampering or smuggling).



spend less time
traveling, reducing
CO2, saving food
and ensuring safety

4. Impact



Costs and time savings

The pilot shows that by implementing Sensefinity sensors, Grupo ETE would be able to

save **10%** in costs related to products (especially food) that do not spoil

save **20%** in time management

increasing **5%** in revenues

increasing **10%** efficiency

by operating unused containers and optimised routes



Food waste and carbon emissions reduction

The solution would contribute to reduce

food waste, transportation and carbon emissions by

30%

The next step would be to increase the shelf-life of fresh fish by 50%.

This technology also aims to reduce the trade of Illegal drugs and human trafficking.

4. Impact



Network Effect and Increased efficiency

Ports operations depend a lot on how optimised are the shipping operator activities: less time needed by the shipping operator from the port operator, less would be the costs for the port industry. The impact of such a solution could be very significant as there are 300 million maritime containers operating right now worldwide.

“The so-called Fourth Industrial Revolution (*the new technologies that appear with Industry 4.0 - Artificial Intelligence, Internet of Things, Big Data, Blockchain, etc ...*) are strongly impacting the different areas of the Shipping Value Chain and those who do not follow this evolution, compromises the sustainability of their business and in the short/medium term they can be irremediably condemned. The Bluetech Accelerator, namely the start-ups that competed, is an excellent testimony to the aforementioned.”

Rui Reis

Board of Director Advisor @GRUPO ETE





“Grupo ETE gave us not only relevant info on the typical maritime container logistic operations such as the type of cargo and the routes used, but also insights on what the best business model and pricing would be preferred by the industry. We also got previous advice on the best way to design enclosures and processes to attach our sensors to the containers

Tiago Andrade
CMO and Co-Founder @Sensefinity

● Sevways x3 shipping Container shipping services automation



freight forwarding



mobile



cloud software

⊗ **Piloting partner:**
GRUPO ETE

⊗ **Pilot type:**
Implementation plan

1. Problem/Opportunity definition

Traditionally, a shipping agency (as a representative of the owner, the charterer -or both- of a visiting ship), guarantees that the requirements for a port call are planned and secured. Therefore, they have a critical role, before and during the ship visit, taking the necessary tasks to avoid or minimize problems. During the execution of these tasks, which are run presently, it is common, like in the case of NAVEX, to use different systems with lack of integration, an operational, financial, port, and CRM system.

2. Solution

Sevways X3 Shipping is a Shipping and Freight Forwarder vertical software designed and developed on top of a fully functional ERP system using mobile and cloud software, focused on the automation of labor and customer visibility of the transportation phases. Other than the traditional modules, Sevways X3 Shipping offers a workflow platform for real-time alerts and B2B integration, business intelligence analytical reports and machine learning task automation predictive algorithms for task automation and optimization.

3. Pilot Scope

The pilot consisted in implementing three of the Sevways X3 Shipping main modules for the Grupo ETE's shipping agency, NAVEX. The pilot focused on simplifying the human task of coordinating and monitoring the activities, by centralising every task around a unique system that communicates in a fully integrated way with all the satellite systems. Sevways X3 Shipping software was developed in the same platform that Grupo ETE has been using since 10 years for shared services, which also represented a unique opportunity.

After the pilot, Sevways issued two different software implementations for Grupo ETE, for NAVEX and for other 6 group similar companies in a formalized new business agreement. It is currently under negotiation a proposal for one of the Freight Forwarders of Grupo ETE.

After the pilot, Sevways issued two different software implementations for Grupo ETE, for NAVEX and for other 6 group similar companies in a formalised new business agreement.

4. Impact

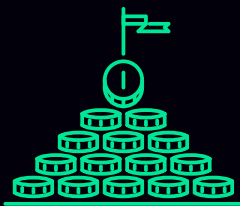


CRM Management

Thanks to Sevways the shipping agency is able to

MANAGE AT 360 DEGREES NEW CUSTOMERS, LEADS AND PROSPECTS

with innovative calendar widgets, mobile application and workflow integration



Costs savings and Time savings

the solution proves to reduce

manual work by **30%**

and reduce

finance entry by **100%**



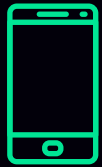
Credit Control

Sevways eliminates three current different systems,

BY INTEGRATING THE PROCESS OF ADVANCE PAYMENT REQUEST AND REAL-TIME VISIBILITY OF THE RECONCILIATION,

with email workflow automation, credit control request and integrated communication with approvers.

4. Impact



Engagement

Sevways X3 Shipping provides AP Visibility Online and

increases mobile usability by **25%**



Carbon Emission Reduction

By constituting a consolidated Cloud, Sevways X3 Shipping contributes to reducing

CARBON EMISSIONS
(7,6 gigaton)

and **PAPER WASTE**
(quantified as 12,1 Gigaton)



Port Call Workflow Management

Sevways allows for integration with authorities and other suppliers tariffs,

**ENABLING
AUTOMATIC
PROFORMA
DISBURSEMENT
ACCOUNT
AUTOMATION
FOR NEW AND
RECURRING
CUSTOMERS.**

This includes workflow automation for all port call activities, monitoring and billing, eliminating other 3 different systems and integrations.



“ Participating in BLUETECH ACCELERATOR added the last mile for Sevways X3 SHIPPING time to market. We are now working with one of the most prestigious Maritime Shipping Group in Portugal, with an unprecedented credibility that we could not achieve by any other means. Also we are now under the radar of several startup accelerators in the blue-growth ecosystem, and we have been qualified for the Chrysalis LEAP Mistral initiative in Cyprus, which we could not attend due to the NAVEX project START.

Rui Almeida

CEO @Sevways X3 Shipping

● Surclean

Laser ablation technology for vessel cleaning



laser
ablation
technology



vessel
cleaning



sand/grit
blasting

⊗ **Piloting partner:**
GRUPO ETE

⊗ **Pilot type:**
Feasibility Study

1. Problem/Opportunity definition

Traditional methods of chemical, sand/grit blasting, water blast, and manual methods are time consuming, generate tons of hazardous waste, impact the health and safety of workers and require numerous pieces of equipment to complete a job. Laser Ablation Technology is in an infancy stage and requires a great deal of education to make changes to the “way it’s always been done”. No one wants to be first to adopt and implement. However, SurClean’s vision of modernising the shipyards with robotics and replacing grit or sand with clean, earth friendly laser applications is very much in line with that of Grupo ETE shipyard managers.

2. Solution

SurClean manufactures laser coating removal and surface preparation equipment that is safe, precise, clean and cost effective.

3. Pilot Scope

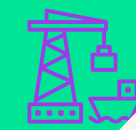
Grupo ETE shipyard management had a very high interest in SurClean’s handheld laser coating removal machine tool as a solution due to space requirements and employee

utilization. However SurClean built this machine tool for small area use and knew it required more time to complete the coating removal process. This additional time negatively impacts the ROI as well as throughput. But an automated robotic solution was not an option due to the space constraints. The engineering team desired to meet in the middle with a flexible rail system. The rail system provides a more accurate removal rate and an ergonomic advantage for the operators.

Grupo ETE representatives traveled to SurClean’s facility in Brighton Michigan. They met SurClean’s staff, suppliers and were introduced to the various stages of the SurClean handheld and robotic processing heads. The engineering team constructed a replica of a proposed solution for Grupo’s current Dry-dock. The replica lacked stability to operate with the HyperDisc Processing Head and for safety the engineers opted to utilize the robot to simulate the application. The coupon mounted on the building I-beams and the robot mount had a greater distance than what would take place in the shipyard.

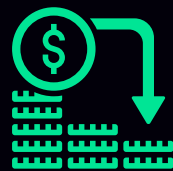
The coupon was 5' x 4' and with both items not to scale, required a lower laser power and slower speed with more passes. However, the test example was successful in providing Grupo's team knowledge of the solution and how it would transition to the actual shipyard.

Currently, **both entities are arranging a JV or other type of partnership establishing SurClean as a Portuguese entity.** The new entity will apply for grants and other funding avenues to finalise a handheld unit that will be rugged for the shipyard environment.



the test example was successful in providing Grupo's team knowledge of the solution and how it would transition to the actual shipyard

4. Impact



Costs Reduction

Surclean proved to reduce Operation Costs from

29 MILLIONS
(using sand blast methods) to
8 MILLIONS
(using laser blast operations)

and consequently generating a great positive environmental impact.




Avoiding waste and pollution

Laser ablation eliminates hazardous waste by products due to the vaporization of the materials and vacuum system that captures the organic and inorganic matter. Sand, grit and high pressure water blast methods produce tons of waste and air particulate that contaminates the air, land and water.

Laser is an energy efficient system and requires a fraction of the energy required to run the motors and other equipment for blast methods. Eliminating airborne particulate and hazardous waste is a responsible solution to improve the living conditions for mankind and the environment.

The more units put into the ecosystem will dramatically impact the environment and the throughput — all of which impacts the corporate profits.



“Working with shipyard staff, I learned the constraints of physical space, how the inspection determines which areas the coatings need to be removed as well as which layers are impacted and why the management is looking for an alternative. This information is the baseline for developing a semi-automated solution instead of a traditional robotic solution or total handheld device. [...] Having a location in Europe will extend our market and sales opportunities that have a direct impact on profit. Teaming with the University and utilizing the grant system in Portugal expands our product offerings without equity dilution.

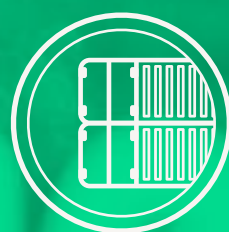
Susan Sprentall
CEO @Surclean

● T-mining

Blockchain based
solution for ports
secure container
release



blockchain



port
container
release



data
sharing

⊗ Piloting partner:
APDL, APS

⊗ Pilot type:
Pre-study

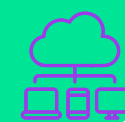
1. Problem/Opportunity definition

In a recent report by Europol (EU Drug Markets Report 2019), the ports of Antwerp and Rotterdam were identified as the main entry points for cocaine into Europe. Almost 100 ton were seized by police in both ports together in 2019. As the cocaine traffic is shifting towards the smaller ports in Europe, weak IT security was identified in the report as one of the main problems.

Companies have invested heavily in their internal IT-systems over the past few years, but they still use paper when sending information to the next party in the supply chain (Bill of Lading, Transport orders, Certificates, PIN-codes for container pickup, ...) resulting in sub-optimal overall performance of the supply chain and issues due to data security problems. Recent initiatives to set up centralised cloud-based platforms have failed as there is a lack of trust between the players in this highly competitive market to share a lot of data with a third party. More specifically, the use of PIN-codes for container pickups have resulted in organized crime units approaching Personnel working for

Carriers, Freight Forwarders, Transport companies and Terminals and offering them money in return for PIN-codes. Europol reports and customer interviews have confirmed that up to EURO 100.000 is offered for one single PIN-code. Clearly, this implies serious risks and directly affects the safety of Staff. In addition, storing PIN-codes in a central database has been proved to be insecure, from a data protection perspective. Over time, several hacking incidents have been reported and cyber crime is now a key concern of many parties involved in Maritime supply chains.

The use of PIN codes also involves significant manual intervention -mostly retyping information into different systems evidence is available on the frequency and costs incurred from manual errors, however, based on customer interviews, resulting disputes & claims have a negative impact on Customer Experience. Lastly, the use of PIN codes has been proven to be ineffective in case of last minute updates like a container



Recent initiatives to set up centralised cloud-based platforms have failed as there is a lack of trust between the players in this highly competitive market to share a lot of data with a third party.

being blocked or revoked. When this information does not reach the Transport Operator in a timely way, the Trucker will arrive at the terminal, not being able to pick up the container, resulting in higher costs and low efficiency.

2. Solution

T-mining offers a Smart Contract framework to build blockchain networks and apps tailored for Maritime, Logistics & Transport.

3. Pilot Scope

The pilots consisted in a pre-study of ports' container release process and challenges, followed by a feasibility study and implementation plan of the blockchain based solution for contained release. T-mining conducted an AS-IS analysis at APDL and APS, and a proposed architecture for a new solution. T-mining also aligned requirements at APS and APDL into a single solution design.

The pilots projects for Port of Leixões and Sinês involved the following steps: process analysis, stakeholder workshop, technical demo and roll-out plan for using a blockchain based Secure Container

Release to secure the container import process at the port. The findings of the pre-study for both ports include the following observations: 1) currently the process is done manually; 2) the communication between truckers and ports already happens through an app; 3) the gate-out is managed by the port authority and 4) both ports are working for an integration with the JUL platform. APS registers a limited number of daily trucks, and the port is now planning to expand and build new infrastructures for trucks. Differently, APDL has a large volume of daily truck traffic.

T-mining has prepared an implementation plan for blockchain based secure container release for APDL, and organised workshops with other stakeholders in the port to get their feedback and measure their interest in participating in a field trial early next year. The T-mining team is now in commercial negotiations with the partners.

4. Impact

The expected impact of the implementation of Secure Container Release at APDL and APS is:



Improved safety of Staff

replacing PIN codes by digital tokens creates a

SAFER WORKING ENVIRONMENT & PROTECTS STAFF

from malicious attempts from organised crime units.

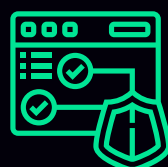


Improved physical security

as pickup rights will be more difficult to steal,

THEFT OF CONTAINERS CAN BE AVOIDED,

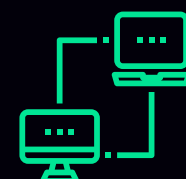
reducing drugs-related crime in the port and city.



Improved data security

A DECENTRALISED NETWORK IS MORE RESILIENT AGAINST DATA MANIPULATION.

Not using PIN codes will avoid hacking as digital tokens can not be stolen without leaving a digital trace.



Improved data sharing

in case of last minute updates and changes,

ALL RELEVANT PARTIES CAN BE NOTIFIED INSTANTLY.

For example, in case of a blocked container release, no new PIN code needs to be created and distributed to all parties - just a simple unblock notification allows the release process to continue, resulting in a more efficient container release.

4. Impact

The implementation of Secure Container Release will also create a foundation for future optimization possibilities such as:



Retrieve Best Unit

IMPROVE TERMINAL EFFICIENCY

by better stacking containers belonging to the same BL and allowing the terminal to set the preferred order of pickup based on the current yard planning; which at the same time reducing the wait-times for the truckers at the gate



Next Mode of Transport

IMPROVE TERMINAL EFFICIENCY

by better predicting the next mode of transport that will be used to pick up the container from the port (rail, truck, barge)

“The transport maritime industry represents globalisation's main driver and generates many valuable opportunities for startups that want to disrupt sector.

José Luis Cacho
President@APS





“We believe decentralised technologies such as blockchain that do not rely on a central data-server, can help to overcome this problem and allow for trusted peer-to-peer data-sharing between the players in a maritime supply chain. Also other features of blockchain, such as the immutable ledger of transactions and the “double spend” solution, can be used to solve particular security and efficiency issues in maritime supply chains.

Frederik Van Outryve

CCO @T-mining

● Techworks Marine

Real time water quality monitoring



real time
monitoring



ports



water
quality



buoys

⊗ **Piloting partner:**
APDL, APS

⊗ **Pilot type:**
Short term
deployment

1. Problem/Opportunity definition

Ports need to constantly monitor and measure in real time the environmental parameters in port areas. Specifically, APDL and APS are interested in monitoring incoming freshwater into port areas from local rivers which may include high levels of nutrients. In case ships are leaking fuel or illegally discharging bilge water in the port area, they need to provide immediate warnings.

2. Solution

TechWorks Marine is a provider of oceanographic equipment and world-class solutions to monitor the marine environment, working in the private and public sectors both in Ireland and overseas. TechWorks Marine assists in the provision of monitoring equipment and metocean survey services for the development and management of ports and harbours. They offer established ports ongoing monitoring systems that can be used as highly beneficial tools in decision making and managing port operations.

3. Pilot Scope

The pilot would consist in deploying Minibuoy for 2-4 weeks in port harbour for ongoing

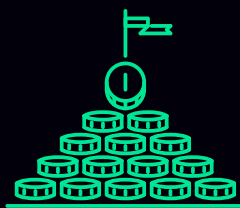
monitoring of specific environmental parameters, providing real time data via CoastEye data platform. CoastEye Minibuoy is a portable buoy designed for estuarine and coastal environments which would be deployed in the Port of Leixões and Sinês with a suite of sensors to measure environmental water quality including a range of parameters such as turbidity, dissolved oxygen, and the presence of hydrocarbons.

TechWorks Marine planned to supply both ports with a Minibuoy and two high quality sensors (one of which is the UviLux PAH) for a 2 week deployment in the port area. **This would provide the port administrations with an example of high quality, real time water quality monitoring, available through TechWorks Marine's proprietary CoastEye data analytics platform. Due to some electronic issues, Techworks Marine had to delay the deployment of the Minibuoy to a future date, still undefined.**

TechWorks Marine planned to supply both ports with a Minibuoy and two high quality sensors for a 2 week deployment in the port area.



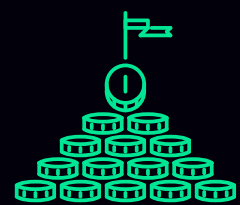
4. Impact



Costs savings

water quality monitoring can amount to as much as

5% of the smaller contracts.



Costs savings

Larger buoys cost on average about €250,000 while the

Mini buoy estimated cost is closer to

€10,000

The mini buoys can be easily deployed, as there is no need for manual sampling.



Reduced risk of pollution and water contamination

As an indirect impact, Techworks Marine

REDUCES THE RISK OF POLLUTION FROM FUEL SPOILING AND WATER CONTAMINATION

by providing an early warning system to the ports.



“ This project allowed us to engage for the first time with Portuguese partners. We are always seeking customers outside our current client portfolio and are also happy to collaborate with research institutions and commercial entities to develop new products through R&D collaborations (e.g. H2020, Horizon Europe, Blue Invest etc).

Sinead McGlynn
EO Manager @Techworks Marine

Blueteach

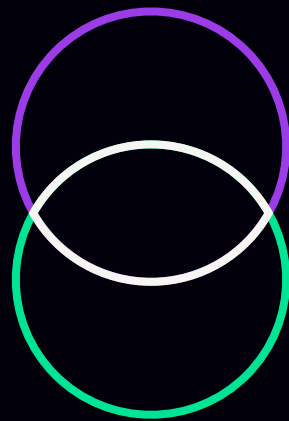
ACCELERATOR

“Our goal is to create a new generation of ocean startups for the World

Ruben Eiras

Ex-General Director Maritime Policy @DGPM





Thank you