



# Neptune

Blue Growth Accelerator

## At the Heart of the Blue Economy Dynamic






The oceans and seas are the largest and one of the most complex ecosystems on earth, determining the basic characteristics which support life, including the largest quantity of natural resources, fossil, mineral and renewable.

At the same time, they also hold a wide range of ecosystem services, from leisure, such as nautical tourism, to logistics and transport of goods between countries and continents, enabling global trading.

The oceans and seas play an essential role in the present and the future of humanity due to their significance of controlling natural conditions, the services they provide to citizens, and their potential to provide the resources to meet the demands of a growing population. All this positions the oceans as a major source of opportunities and technological challenges, but also as an environment likely to be altered and impaired by human activities and their substantial and irreversible consequences on a planetary scale.

The European Commission has launched several initiatives to maintain and further develop the leadership which European countries have historically had in the expertise and application of knowledge and technologies for the use and exploitation of the ocean with notably the [long-term strategy on Blue Growth](#) which intends to support sustainable growth in the marine and maritime sectors as a whole on three components:

-  Develop high potential sectors for sustainable jobs and growth (Aquaculture, coastal tourism, marine biotechnology, ocean energy & seabed mining);
-  Provide knowledge, legal certainty and security in the blue economy (marine knowledge, maritime spatial planning and integrated maritime surveillance);
-  Sea basin strategies to ensure tailor-made measures and to foster cooperation between countries.



*NEPTUNE project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 691554*

In this global context, NEPTUNE project which stands for New Cross Sectoral Value Chains Creation across Europe Facilitated By Clusters for SMEs' Innovation in Blue Growth by the INNOSUP-1 component of the HORIZON 2020 programme is being funded since 2016 and until the end of 2018.

The NEPTUNE innovation action project aimed to support the **emergence of cross-sectoral and cross-border impactful and innovative solutions to improve existing or develop new technologies, services or products, improve production processes replacing or reducing the use of critical resources and deploy large scale demonstrators**. It is driven by the integration of new technologies and know-how from domains as Water Management, Aerospace, ICT, Microelectronics, Agrifood, Logistics, Creative Industries, Energy, and Mobility to foster the development of Blue Growth industries in Europe in the five following domains.



## A Blue Growth Accelerator

The accelerator was dedicated to SMEs and would-be entrepreneurs and deployed through two main concepts:

**An innovative and collaborative platform to facilitate the emergence of partnership and projects**, offering SMEs Open-spaces for remote collaboration through collaborative virtual environment (immersive tools) to participate to transnational meetings and workshops dedicated to the key value chains targeted by the project.

Two Interclustering innovation clubs targeting different Blue Growth areas were organised in each partner region using connected meeting rooms and allowing all the participants to work simultaneously together in a same virtual room.

Two face to face brokerage and matchmaking events, once project ideas have matured, were then organised at the European level to share and bring together SMEs, to implement concrete cross-border partnerships and to develop a better understanding of supply and demand challenges and solutions within key value chains.

**A toolkit for SMEs and would-be entrepreneurs** to support them in their development through Coaching and Mentoring Services and by providing them a financial support of up to 60.000 € per selected SME.

**Coaching and Mentoring Services (CMS)** were operated by the NEPTUNE clusters partners, offering an accompaniment through 6 key stages of the SMEs



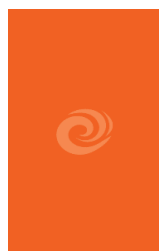
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development: Incubation, Business Model, Funding Opportunities, Technological Support, Intellectual Property Right, Internationalisation and Branding.

A **voucher scheme** was designed to support financially SMEs, alone or in consortium, 2 calls for interest were launched with a simplified application process to benefit from funding to:

- Afford paying external experts to deal with problematics such as: Incubation and Entrepreneurship, Intellectual Property Management, Overcoming Non-technical Barriers, Technology Development/Transfer and Scalability and Internationalisation;
- Cover internal expenses (of which staff cost) for prototypes and large-scale demonstrators.

## Clusters as facilitators



8 experienced clusters, with the support of key partners as local development agencies, consultancy firm and Engineering School from different but complementary domains joined their efforts in NEPTUNE to make this Blue Growth Accelerator successful.

The knowledge and know-how gained through years of practical and daily support provided to SMEs and startups allowed the clusters to be more effective in terms of:

- **Capacity of mobilization** with more than 200 applications received for the 2 calls and in terms of support provided to concretely submit a proposal;
- **Knowledge of the SMEs strategies** for a smooth integration of NEPTUNE support in their overall development;
- **Proximity with the SMEs** and a timing to answer any of the questions raised.

In addition, clusters working together and gathering their own community have demonstrated their capacity to create new synergies between actors from different domains and to facilitate access to new markets raising their awareness about the Blue Growth potential.

The implementation of a cascade funding mechanism in NEPTUNE, consisting in distributing European public funding, through Vouchers directly to SMEs in order to them in their innovation development.

The mechanism is considered by clusters and SMEs as **a positive initiation to European Funding for SMEs and start-ups** which are historically the typology of actors who encounter difficulties to access those types of funding.

The simplified application process as well as the accompaniment of the clusters have undeniably facilitated their participation.



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# Main achievements



NEPTUNE's calls for interest has been a great success, with **200+ applications submitted** by innovative European SMEs and would-be-entrepreneurs.

On those applications, **41 innovative projects** of which 15 Large-scale demonstrators **were granted with a total of €2.8 million**.

In total, **72 European SMEs and 3 would-be entrepreneurs** have benefited directly from NEPTUNE Vouchers. Beneficiaries are coming from **6 European countries**: France, Greece, Italy, Romania, Spain, and Sweden.

**100+ Coaching and Mentoring Services** delivered.



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# Testimonies



Peter WEISS, Director of the Space Department at COMEX

**TRITON project:** *Maritime surveillance from stratospheric balloons. This system could be used - for example - for marine pollution, particular maritime traffic situation or the surveillance of the marine life.*



"In 2016, we discussed with Pôle Mer Méditerranée Cluster (PMM) our first test named C-Launch. We wanted to go further and PMM informed us about the European accelerator NEPTUNE. This mechanism corresponded entirely to the theme and the budget necessary to continue our approach. In addition, we had the opportunity to continue our cooperation with Zero 2 Infinity, since our Spanish partner was located in a region eligible for NEPTUNE. Each of us was able to benefit from a voucher for the realisation of a common demonstrator. We did sea trials by launching 4 balloons off Marseille and everything went well. We are coming to the end of the project and we are delighted with this experience.

We would like to thank Pôle Mer Méditerranée cluster for supporting us for years on our projects. We are in permanent contact with them to set up new projects, find funding opportunities and relay our communications.

During the Triton project, we had a new idea: the crowdflying. On the same principle as crowdfunding, we created the idea of a participatory flight. Indeed, it is possible to load a balloon launched at sea several hundred kilos of payload. The idea is to allow customers to embark on the same flight different objects (Earth observation systems, communication systems, art objects ...) to conduct tests, experiments or communication operations and thus reducing costs. This reduction of costs makes this type of mission equally accessible to SMEs, research organisations and universities, etc. We have already presented this principle to the European Space Agency (ESA) as part of the "Ocean x Space" competition. This conference aimed to federate synergies between the maritime sector and space.

Invited by ESA, we presented this project to about 200 experts in space, maritime and Earth observation. We received the second prize."



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Călin Horia TOMOIAG, Director of TOMAS Prodimpex and Managing partner at STEA TECH

**DepuSAN project:** *Eco-friendly solution for the waste water reuse in small-medium size farms*

**ANASYWA project:** *Pure water obtained through nanofiltration technique*



"Last year we succeeded to win the competition run by the NEPTUNE Accelerator, through our regional partner, North-West Regional Development Agency, which was proven supportive all along the project implementation. The fact that we had the chance to present our innovative outputs at the Final Showcase Event in Brussels was a great success, which was further disseminated and now we are in search of clients interested to adopt these disruptive water-related solutions."

**DepuSAN** project: a genuine Circular Economy solution was implemented by using an innovative and eco-friendly polymer resulted from a previous research of the Italian partner ALFA-MC. Its effectiveness was tested during the project and proved to be very effective in removing pollution from cattle wastewater (urine, manure) and reuse it in a shape of sanitized water for stables cleaning in a safety way. The solution can also be applied to other fields, such port management, cruise ships, irrigation, process waters. In this way, thanks to the Neptune project, our solution switches a problem in a resource for any interested small-medium size farm. The project helped us, the two partner SME, in defining technical and economical key elements for commercializing and scaling up the innovative solution.

**ANASYWA** project: By using the nanofiltration technology, the innovative equipment softens the water from different sources (including fountains, wells, springs), eliminates magnesia and iron, reduce the nitrates and nitrites but also the bacteria, resulting high quality drinking water, of a capacity of 800 liters per hour but can range up to 2000 liters per hour. The traditional water softening salt method is therefore replaced with minimum costs and with positive impact on the environment. The prototype developed by two Romanian companies from Cluj-Napoca is a mobile and compact equipment, software included and developed by the partner Electronic April, has the dimensions of 1,50 x 1,2 x 0,80 meters and does not imply expensive consumables. Next steps are the commercialization and scaling up; the price has been set up under 2000 euro, the companies having the capacity to produce 2-3 pieces per month.



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Linda KOKKOLA, COO at Watersprint AB

**Neptune project:** *The future water recycling product for households combining two patented technologies - a start at the high-end market in California USA.*



Watersprint was created in 2013 focusing on product development that resulted in a world leading technology based on blue LED technology to disinfect bacteria, viruses and protozoa in water. Sofi Filtration started in 2012 and has developed a self-cleaning filter for industrial purposes and water recycling. The customers are mainly within mining and district heating so areas where the flow rates are very high. Both companies have patents for their respective technology.

Watersprint and Sofi Filtration met at a WIN (Water Innovation Network) in February 2017 and started to discuss. When the opportunity for a joint project for new potential product where we already had contact with a potential customer the decision was easy. Experiencing domestic water problems in California an idea to downscale Sofi's filter solution appropriate for household level was developed. Watersprint had at the same time developed the second generation of UV-LED based water disinfection units with a very good disinfection capacity at higher flow rates which match the needs for a household. The potential outcome was a complete package with filters, sensors, automation, disinfection and power supply in a compact solution that later on can act as a mini circular recycling unit.

The Neptune project included development and testing of the prototype that shall initially be marketed to households, private- and public- institutions for potable water. This was a stepping stone for the next phase where we will further develop the joint innovation to include recycling of grey-water in micro and macro environments.

Currently both the initial potential customer in US and two more companies are interested in the small combination product. We will make more industrialised prototypes in Q1-19 and then with the feedback from the interested companies continue for a mass producible product during 2019. The mini recycling unit is still a dream future product, but we are one step further towards the goal.



Our Sofi and Watersprint engineers with the prototype at the friendly user's place in Anaheim outside of Los Angeles



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Joanna BAKSALARY, Head of the Space Area at ITTI Sp. z o.o.

**ABECE (Anticipation of Blue Economy Cascading Effects) project:** *a simulation tool for cross-sectoral cascading effects identification and prediction in regards to environment and coastal hazards.*



“The simulation tool for cascading effects identification and prediction was created in 2016. The tool was ready to use, equipped with all the features needed. However, we did not have any proper, complete, elaborated and educative scenario implemented. During one of the meetings organized for Polish space sector we talked about the possibilities to get founding for such activity. SPACE-PL told us about the European accelerator NEPTUNE and decided to go for it. Fortunately, our proposal has been accepted and we could start improving our tool to make it really useful for crisis management practitioners. After scenario creation and implementation, the PREDICT tool and the ABECE scenario were presented in to a group of practitioners and decision-makers. The demonstration took place in the Main School of Fire Services in Warsaw. SPACE-PL representative also actively participated the meeting. This event was very important for us since it gave us opportunity to collect opinions from potential users.

The cooperation with SPACE-PL during the project was very good. Any problem appeared, they were always eager to help and seek the best solutions. We would like to thank Space-PL cluster for supporting us on our projects. We are in permanent contact to set up new projects and find new funding opportunities”.



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Lander Unanue, CEO of STOCKARE

**RFIDrone project:** *by the combination of RFID and Drone technologies applied together, it could be beneficial for port logistics processes, to monitor the cargos and containers in large areas and warehouses.*



“STOCKARE is a new-born technological startup with knowledge in Internet of Things technologies to apply to the logistics sector. As an active member of the Cluster de Movilidad y Logística de Euskadi (MLC ITS Euskadi) the European accelerator NEPTUNE opportunity came in. We, at STOCKARE, started shaping a project that could solve the port logistics problems by applying two main technologies: RFID and Drones. In order to build a strong consortium, we contacted Drone by Drone company to check if they would be interested in applying together to this program and after an affirmative answer, we decided to go for it.

The application to the NEPTUNE program had 3 main objectives:

- To develop a product / service that could solve the port logistics problems, such as monitoring the cargos and containers in large areas to easily locate and identify these logistics units by reducing labor, time and costs.
- To establish STOCKARE as a new startup.
- Just before the program, STOCKARE was an idea in which we have been working for several years, but we needed the help to jump from “would be entrepreneur” to a real company by hire employees.
- To be known and enter the network of the big corporations, not only of the Cluster but also of the region ecosystem.

Thanks to the NEPTUNE program and the support of the Cluster de Movilidad y Logística de Euskadi, we have successfully achieved these objectives and STOCKARE is now a reality.

Related to the RFIDrone project, and even if the legal conditions of flying drones in many ports and logistics zones are still to be defined by the Spanish government and restricted by now, many industrial companies have shown interests in knowing more about the developed product in order to apply it to their large area facilities to do instant inventorying of their assets. This proves that the detected problem is not only applied to the port zones but it is spread throughout the large industrial and manufacturing areas, which multiplies the possibility of use of the Drone and therefore for the success of both companies involved in this project.”



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Virginie LAFON, Executive Manager at I-SEA



**World-BIOCOAST project:** *The World-BioCoast project aims to develop a new generation mapping protocol combining field and satellite data (Sentinel-2, Pleiades, etc.) to derive coastal habitat maps according to the existing regulatory typologies (EUNIS, Corine Biotope, Natura 2000).*

**CBAS project:** *Based on Sentinel-2 and Sentinel-3 observations, CBAS (Cyanobacteria Bloom Alert Service) ambitions to create a comprehensive and scalable solution for the in-land water monitoring and alerting.*

"In the framework of NEPTUNE, Aerospace Valley supported two of our projects focusing on the development of space applications for the surveillance of the environment.

First project selected was World-BioCoast. In 2016, we launched the BIOCOAST project in France. BIOCOAST aimed at delivering biodiversity maps of natural coastal areas. It was designed as surveillance and decision-support tools for management purposes. Five pilot areas were integrated in BIOCOAST. The growing interest of the managers of natural environments for this emerging service encouraged us to propose a larger scale demonstration of the derived products. Demonstration involved the test of the concept in Greece, with the precious contribution of our Greek partner in World-BioCoast, TERRA SPATIUM. Then, with the support of World-BioCoast, six demonstration meetings took place in France and Greece. The participation of numerous site managers, regional and national deciders produced fruitful and constructive debates that made from both projects the starting point of the commercial development of the service. Current perspectives for 2019 are already over the projections made in 2017.



The story of CBAS started in 2017, with a phone call we received from Aerospace Valley. The cluster made an early link between I-SEA and N7 Mobile in Poland. N7, a company developing mobile applications, had the desire to propose to Polish users and alert service detailing water quality status of lakes with regards to proliferation of cyanobacteria: CBAS. I-SEA accepted the tricky challenge to feed CBAS with a microalgal bloom detection tool based on Sentinel-2 and Sentinel-3 observations. With this aim, the companies designed image processing and products delivery tools, together with a dedicated Mobile App. The service was run during summer 2018 to start the evaluation of the efficiency and usefulness of the system with regards to users and managers. The partnership between I-SEA and N7 went far beyond this first initiative developed in the framework of Neptune. Led by I-SEA, the consortium, including now Planetek Italia and Hydro-Cote, was selected to develop the demonstrator over the Baltic Sea in the context of the development and promotion of demonstrations of CMES downstream services. Thanks to Neptune and Aerospace Valley, and also using E.U. Copernicus Marine Service



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Information, CBAS is now offering the possibility to 4 European SMEs to launch a water quality surveillance service at a worldwide scale”.



**Gabriel MAVRELLIS, CEO of Geospatial Enabling Technologies (GET)**

**AMOS project:** *Shallow Water Aquatic Monitoring using Acoustic Sensors and Satellite Images.*



GET is an innovative Greek SME working in the GeoICT sector. It utilizes open data, open standards and data analytic tools to develop advanced applications for geospatial data management. The company offers also Earth Observation solutions based on the Copernicus Sentinel data and other Open Spatial Data Repositories.

As a member of SI-Cluster we were informed from Corallia Clusters Initiative about an R&D opportunity in the framework of the H2020 European accelerator NEPTUNE project. The project supported innovative ideas in the area of blue growth aiming to develop new cross-sectoral industrial value chains across the EU, by building upon the innovation potential of SMEs.

For GET that was a great opportunity for enhancement of our EO solution but also for international collaboration and expansion of our services to international market. Through the NEPTUNE B2B collaboration events we had the opportunity to meet Semantic TS, a French company specialized in marine acoustic monitoring. Together we submitted a proposal which combined the expertise of the two companies. Our project, AMOS, developed a platform that provides information about seabed (seafloor classification and bathymetry) as well as information about fishery resources using the SEMANTIC TS eBEEM single beam acoustic system and the spatial data infrastructure provided by GET. The system targets sea shallow water (ranging from a few decimeters depth to 40m but it could also be used in inland waters like rivers, lakes, and ponds. The system was tested successfully in two pilots, in France and Greece, with the participation of relevant local stakeholders like the Laboratory of Marine Remote Sensing from the Department of Marine Sciences of the University of Aegean.

At the end of the project we had the opportunity to present the projects' outcome to a broad audience at the NEPTUNE Event which was held at Brussels. Both companies were able to benefit from the provided voucher and we are very delighted with the overall experience.

We would like to thank Corallia for the provided support throughout the duration of our project. We are looking forward to work with them again and explore new R&D opportunities in the future.



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## Consortium



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