

PLOCAN

Oceanic Platform of the Canary Islands

Strategic **Plan**
1721

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1. Compliance with the previous Strategic plan

1.1. Introduction

Important Spanish ICTS¹ have usually been conceived using clear and specific international references, following established and well-known frames, either in the science or technology domain, based on previous experiences and lessons learned. In the case of PLOCAN², there were no previous holistic experiences of integrating several kinds of facilities (offshore platform, underwater base for marine vehicles, marine energy test sites, oceanic observatories, etc.) usually operated by separate communities (oceanographers, energy, telecoms or robotics engineers, etc.) and rarely combined. The closest references in the marine and maritime sector concern partial approaches of isolated disciplines frequently worked out independently and without an integral vision, common objectives or connected challenges.

This innovative *eclectic approach* caused some initial uncertainty arising from this lack of explicit international models. However, the key challenges of maintaining and sustaining the essential services provided by the oceans and harnessing their wealth, required this holistic approach, whereby science, technology, sociology, economics or legislation must be combined.

Fortunately, PLOCAN's cross-thematic perspective soon connected with the European vision and conceptual approach to blue growth and new trends towards exploring multi-use offshore platforms. The hypothesis was based on multi-use as a more efficient socio-economic and environmental approach to harnessing ocean resources sustainably. Special mention and acknowledgement must be made of the support provided by the "The Ocean of Tomorrow" call to test this vision. PLOCAN was leading TROPOS³, one of three multipurpose reference projects, involving a consortium of 21 partners from 9 different countries. The project provided a community of researchers working jointly on innovative multi-disciplinary approaches which combines a broad range of expertise in hydraulics, wind engineering, aquaculture, renewable energy, marine environment, project management, socio-economics and governance. The European oceans are leading a massive development of marine infrastructures, including offshore wind farms and constructions for marine aquaculture, just as the maritime industry has done in the past. However, it is crucial to conciliate those activities by using the marine space more efficiently, providing more environmental guarantees and also de-risking investments by providing social support and commitment based on a better understanding of the ocean. This should be done quickly to keep pace with growing research and innovation competition in all the world's oceans.

PLOCAN's holistic approach has been tested thoroughly through FP7⁴, as part of 9 projects financed by this programme, while most of the facilities were still under construction and only partially operational. Those projects and the interaction with the broad community of users associated with them have provided essential dialogue and engagement to evolve services and tune facilities according to user demands. This has been of particular importance to mitigate the effect of the deep economic crisis that has severely affected public research support for science and technology in Spain over the last decade. It also alleviated the administrative delays related to the approval and authorisation processes, which, on the positive side, has provided the opportunity to help pave the way for the approval and authorisation of emerging blue growth activities in Spanish offshore waters.

1.2. Infrastructure construction, equipment acquisition and operation

The primary objective of the previous strategy plan (2013-2016) (hereinafter abbreviated to *PSP13-16*) was to complete the development of the observatory, the construction of the offshore platform and to initiate its operations. The design was based on a "caisson type" solution of precast concrete completed and moored successfully in late 2016. The workshops, laboratories and general services, space for containers and crane for handling loads were fitted in 2017. Completion of the construction work and commissioning was scheduled for 2015 in *PSP13-16*. The installation was delayed a year due to the complexity of operational, administrative and legal constraints in offshore waters. Another relevant factor affecting the delays was the uncertainty associated

¹ Large Scientific and Technological Facility (*Instalación Científica Técnica Singular*)

² Oceanic Platform of the Canary Islands (*Plataforma Oceánica de Canarias*)

³ EU FP7 Project acronym: "Modular Multi-use Deep Water Offshore Platform Harnessing and Servicing Mediterranean, Subtropical and Tropical Marine and Maritime Resources"

⁴ Seventh Framework Programme, European Union research and development funding programme (2007-2013)

with sea operations that require high safety standards. The manoeuvre to install the platform had to be redesigned by the building company to introduce an additional superstructure of floats. Monitoring the buoyancy testing in the pre-mooring phase detected significant leaks between the cells of the caisson. Thus, any meaningful water transfer between the cells became a potential risk, causing an imbalance of loads during the transport of the platform from the port where it was constructed, to the mooring site at sea, especially in the event of having to extend mooring operations for unexpected causes. To avoid this risk, a specific new structure was developed, manufactured and installed, thus causing a delay in the mooring schedule

Mention must also be made of the approval and authorisation difficulties to reserve the use of maritime space required. The integral nature of the potential uses involved and foreseen for the test site, has been a novel challenge that has required interactions with almost twenty regional and national administrative entities, with competences in several areas, such as environment, industry, merchant shipping, defence, aviation, etc. The installation of the platform in its final location was a highly complex technical and administrative milestone, which has also produced valuable, practical insights and intangible knowledge related to potential actions to overcome regulatory barriers to promote the blue economy in Spanish offshore waters.

Another essential objective was the deployment and commissioning of the IECOM⁵. The IECOM facility consists of an underwater electrical-optical cable, offshore connectors along with auxiliary equipment and devices to transmit current (2x5MW/13.2kV wires) and data (24 pairs fibre optic cables providing 10 GBs). It also included an onshore infrastructure, which provides an electrical-optical cable, electric power transformation elements, a manhole for the transition of marine and terrestrial cables, auxiliary devices and equipment.

1.3. Fitting out and planning the maritime area of the test site and the oceanic platform

This objective was to characterise the space and provide public access to the information generated by different kinds of observations, such as in situ oceanographic instrumentation. A specific project (POTEMA⁶) was carried out in order to develop a programme for observation and environmental monitoring of the concentration of power generation devices on the PLOCAN test site. This action concluded successfully in 2015, with data available and accessible from PLOCAN's web portal. This project allowed us to carry out an integral characterisation of the marine environment at the test site and around the platform, addressing the following aspects: hydrodynamics, geophysics, water quality, benthic communities, cetaceans, ichthyology or submarine noise

1.4. Developing the public access system to the ICTS services

PLOCAN's main facility (the fixed offshore platform) was under construction during PSP13-16. Therefore, no formal open calls have been launched to provide access to it. Nevertheless, other facilities, such as the marine test site and the [ESTOC⁷ station](#) have been partially open to test user applications from the marine and maritime scientific and technical community (e.g. [FIXO3⁸ transnational access](#)). For these reasons, more than 50 accesses (54.72% Open Access) to PLOCAN facilities have been registered during this evaluation period.

The technical and administrative experience accumulated during these accesses has been used to design and develop the [open access policy and protocol](#). Besides, PLOCAN has developed a plain, simple and effective [access system to its facilities and services](#). The main achievements to be highlighted from the previous period are:

- Updated Portfolio of the Facilities and Services offered by the Infrastructure
- The Access Policy
- The Access Protocol, Applicant Guidelines and the Rules and Terms of References for External users
- The Data Policy
- "First contact initiation package", which includes templates of: Access Letter of Intent (ALI), Memorandum of Understanding (MoU) and Non-Disclosure Agreement (NDA)

⁵ Marine Electrical and Communications Service Infrastructure (*Infraestructura Eléctrica y de Comunicaciones Marina*)

⁶ ERDF project acronym: "Programme for observation and environmental monitoring of the concentration of power generation devices in the PLOCAN test site"

⁷ European Station for Time Series in the Ocean (*Estación Europea de Series Temporales Oceánicas de Canarias*)

⁸ EU FP7 Project acronym: "Fixed Point Open Ocean Observatory Network"

The results of the number of accesses between 2013 and 2016 have been below PLOCAN's potential (Research Infrastructure Description Report – Model A; 13-16). The main reason, as already mentioned, was the delay in construction. Accordingly, with the provisions of the previous strategy, and in parallel to the building process, PLOCAN has been very active nationally and internationally, engaging stakeholders and developing a community of potential users. EU⁹ projects have been a successful approach to building partnerships and engagement. Thus, PLOCAN has increased the number of research projects under execution in the previous period by nearly a 26%, from 19 to 24 projects between 2013 and 2016.

1.5.Environment and sustainability

The environmental and sustainability objectives established by *PSP13-16* were achieved. The studies of the impact of the oceanic platform, the test site and its operations were carried out without significant delays or setbacks. Additionally, the studies of the environmental impact of the VIMAS¹⁰ base and the development of an environmental policy have also been attained on schedule. These cross-cutting objectives affect all the other areas and have been monitored throughout the ICTS life-cycle to ensure the sustainability of operations. The environmental impact measurements were certified using ISO¹¹ 14001:2015 in PLOCAN's facilities. The IMS¹² included procedures for waste management, consumption and emissions control, and provided indicators which also allow the environmental impact of the organisation to be monitored.

A specific objective of the previous plan that has not been fully accomplished concerns attracting the international community interested in the environmental impact of deep sea exploration and mining. PLOCAN's test site can provide an optimal place for studying devices, technologies and actions associated with the investigation of mining resources on the sea-bed. The limiting factors of these technologies are the potential damage and impact on deep sea communities, which is a critical factor for the future development of submarine mining. However, the activity is still very incipient, financed by a small number of projects restricted to a small group of researchers, but without the full involvement of private companies. PLOCAN has participated in consortia requesting projects related to exploitation, but no outstanding initiative in this field has resulted. The companies with potential interest foresee long-term future developments in the sector, but still without a clear horizon.

1.6.Scientific and technological objectives

A pertinent assessment of the impact of the R&D&I¹³ conducted and promoted by PLOCAN can be compiled from the knowledge outputs provided by the 39 important projects (27 of which have received funding from the EC¹⁴) that have involved PLOCAN coordination or participation. Support to 511 partners from 376 institutions, both public and private (48%:52%), from 38 different countries was given. During this period, PLOCAN has been involved in implementing and submitting 141 proposals with a success rate of 24% and with €5m in competitive funds of non-national origin, representing 55% of the total (€9m in total). This work has been performed with staff confined to the design, construction and equipment phase of the platform.

The integrated observatory developed three main components: one fixed open ocean station, a coastal area and oceanic transects in the Eastern Central Atlantic area. The data provided by ESTOC has been important for studying global change processes and for monitoring EOVS^{15,16}. The coastal area was tasked with a double objective: monitoring of and support for the test site and studying coastal pollution associated with multiple anthropogenic sources and, above all, to the blue growth activities that have taken place in the same area at the same time. The oceanic transect was designed to help to fill the observation gaps in the Eastern Central Atlantic area.

⁹ European Union

¹⁰ *Vehicles, devices, equipment and underwater machines*

¹¹ International Organization for Standardization

¹² Integral Management System

¹³ Research and Development and Innovation

¹⁴ European Commission

¹⁵ Santana-Casiano, JM; González-Dávila, M; Rueda, MJ; Llinás, O and González-Dávila, EF (2007). The interannual variability of oceanic CO₂ parameters in the northeast Atlantic subtropical gyre at the ESTOC site. *Global Biogeochemical Cycles* **21**: 1-16. doi:10.1029/2006GB002788.

¹⁶ Essential Ocean Variables

The mutual reference of the oceanic samples in open and deep waters, free from local pollution, provides a good reference for the coastal observatory. Besides, the observatories serve other purposes, including testing new sensors, providing data for understanding processes and models in pristine and anthropogenic areas or developing new methodologies.

1.7.Organisational and operational development

ICTS objectives related to organisational issues focused on efficiency, flexibility and resilience, providing PLOCAN with capacities to evolve and adapt. These objectives have been almost fully achieved, providing a dynamic and creative environment, but they have been affected by the constraining legislation put in place to control the public budget during the period of economic crisis in Spain. On the other hand, the organisation has provided a solid and structured management system for project accounts and audits, its financial resources and its human resources, while always respecting hiring and working conditions of the public sector in compliance with Spanish and EU legislation¹⁷. An application was created to comply with transparency principles, accountability, high standards and quality controls, sustainability and minimal environmental impact and a significant contribution to the principles of efficiency and effectiveness in public expenditure. The objectives in this section have been almost fully achieved, especially those related to promoting, strengthening and consolidating a system of gender equality in all areas of the organisation, based on non-discrimination and equal opportunities. PLOCAN's staff is comprised of 20 women and 26 men (44 % vs 56 %) of over 5 different nationalities.

Other aims achieved have been the improvement of the recruitment system, quality certification, social responsibility, accounting management systems, retention of talent (e.g. incentive system) and cooperation with other public entities pertaining to the ICTS Map.

1.8.Social and economic impact

A main objective of PLOCAN was (and is) to contribute to industrial development and innovation, working both with technological SMEs and large companies, and to contribute overall to social and economic development. During PSP13-16, PLOCAN has participated in projects with 126 enterprises.

In terms of dissemination, the PSP13-16 has served as a basis to consolidate the consortium as an organisation dedicated to communicating and improving the scientific culture of the population. In fact, the activities carried out in this scope in the year 2016 were assessed by the FECyT¹⁸. As a result, PLOCAN became a member of the FECyT Scientific Culture and Innovation Network in 2017. PLOCAN's dissemination activities were boosted during the PSP13-16 period, by preparing a strategy to activate social networks as part of its day-to-day duties. These activities are intended for a general public, with the exception of specific educational initiatives, more focused on promoting science and technology careers. In this sense, two initiatives were started during this period, EDUROVs¹⁹ and Educational Passages.



Figure 1 Location of the Oceanic Platform of the Canary Islands (PLOCAN)

¹⁷ Ley 19/2013, de 9 de diciembre, de transparencia, acceso a la información pública y buen gobierno
Orden EHA/1037/2010, de 13 de abril, por la que se aprueba el Plan General de Contabilidad Pública.
Ley 22/2015, de 20 de julio, de Auditoría de Cuentas

¹⁸ Spanish Foundation of Science and Technology (*Fundación Española para la Ciencia y la Tecnología*)

¹⁹ Educational ROVs

2. Mission and Vision

PLOCAN's mission is to provide a cost-effective combination of services, including housing, operations, data, and access to the offshore multi-use platform, observatories and test site facilities, that meets the upcoming scientific challenges of the oceans and socioeconomic needs.

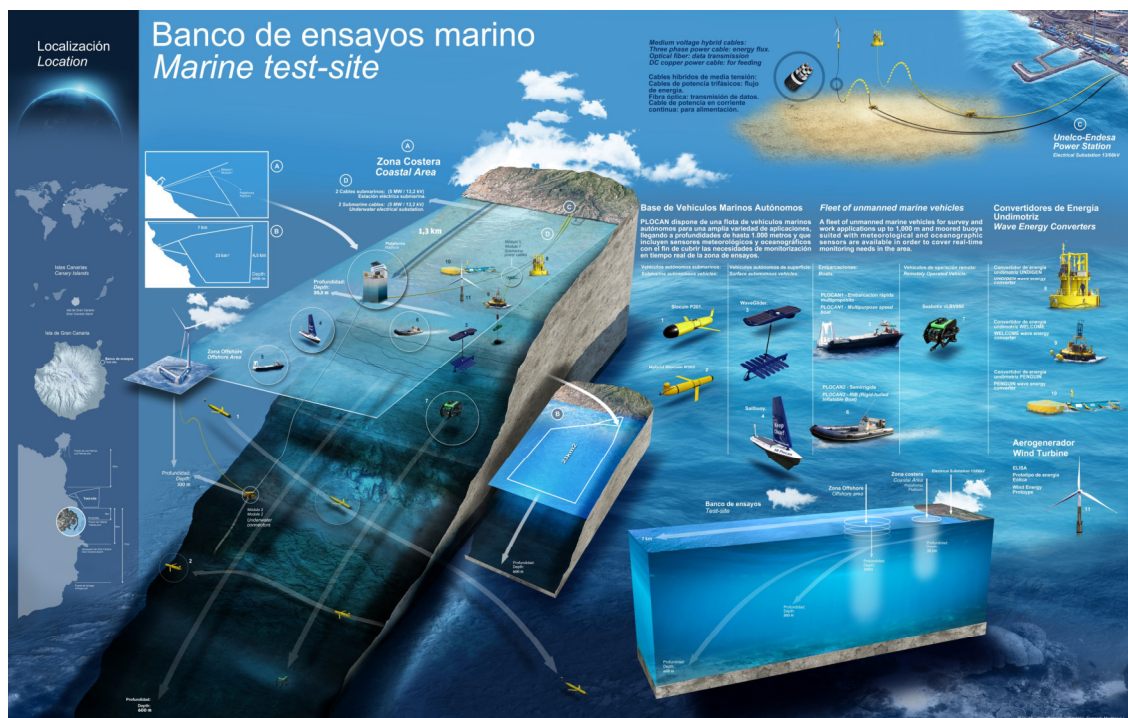


Figure 2 PLOCAN's marine test-site

The vision is to become a world-class infrastructure contributing to the improvement of marine conservation and the sustainable use of the ocean by offering great value services and attracting excellent science and technology users at national and international level, responding to the R&D&I challenges of the marine and maritime sector, and contribute significantly to underpinning Spain and the EU at the forefront of this sector.

The vision remains with a distinctive and practical approach, to promote the better use and management of the ocean, accelerating the generation of science of excellence and its conversion into social and economic value. However, PLOCAN provides a unique feature to its vision by attracting international talent, resources and flagship initiatives to an outermost archipelago in the middle of the Atlantic that wants to harness the untapped potential of the marine economy and show other remote island areas a new way forward.



Figure 3 Multi-use offshore platform

3. SWOT Analysis

This SWOT²⁰ analysis is complementary to the relational analysis. It focuses on the strengths, weaknesses, opportunities and threats that are either aspects of PLOCAN itself (especially, strengths and weaknesses) or are elements of the external environment (especially, opportunities and threats) that are directly related to, or could significantly influence, PLOCAN's core mandate and operations. Thus, whereas the relational analysis deals with more distal factors, the SWOT analysis focuses on issues which are more proximal and therefore more within the control of PLOCAN's control.

3.1. Strengths

- Unique facilities, capabilities and equipment.
- Strong international profile of PLOCAN as a novel state-of-the-science ocean observatory, specifically a multi-purpose offshore platform, marine laboratory and workshop for studying simultaneous uses and management of marine resources.
- Island effect living laboratory in the outermost regions.
- Strategic location in the Eastern North Atlantic, with oceanographic links to both the African and South American continental margins.
- Commitment, experience and expertise of PLOCAN's Executive Board and Strategy Council
- Highly recognised expertise, competence and experience in international collaboration of the PLOCAN staff and researchers.
- Location in the southern part of the Eastern North Atlantic allows for marine operations that are rarely affected by sea state hazards.
- Successful funding track record and diverse current awards (ERDF²¹, FP7, H2020²²).
- Several years head start on most other planned European ocean observatories, thus focusing attention and maximising both research and commercial opportunities.
- Availability to the global community interested, collaborative partners, and expanding user base.

3.2. Weaknesses

- Engagement of the dispersed user community and other distant research institutions.
- At a relatively early stage of facility development and testing of new systems of the PLOCAN infrastructure.
- Complex legal and administrative constraints that are a handicap to operational progress (procurement, hiring, licenses, grants...).
- Geographical distance from European research and industrial centres, as well as North and South American centres.
- Necessity to further develop of operational policies and procedures.
- Limitations of operational effectiveness, including risk management and human resource management within the public sector.
- Immature stage of branding, communication, and promotion.
- Lack of a defined career path or promotion for the staff.
- Low salaries compared to other national ICTS or research organisations.

3.3. Opportunities

- Enabling cutting-edge research for integrated ocean science and technology development.
- Informing ocean policy and ocean science and technology issues for Spanish, Canary Islands, and EU government agencies.
- Creating commercial opportunities for Spain's marine S&T industry.
- Engaging students and exciting the public about ocean research, novel technologies, environmental issues and career opportunities.

²⁰ Strengths, Weaknesses, Opportunities and Threats analysis

²¹ European Regional Development Fund

²² Horizon 2020, European Union research and development funding programme (2014-2020)

- Focusing PLOCAN's identity and agenda to create a distinctive niche within international ocean observation science programmes.
- Promoting the PLOCAN observatory as a test-bed for commercial technology development, from technological demonstrators and prototypes to commercial products, especially offshore renewable energy.
- Demonstrating relevance to Spanish, Canary Islands, and EU S&T priorities.
- Create value and progressively demonstrate social and economic impact.
- Providing excellent facilities for students, visiting scientists, and industry specialists (including shore facilities, ship, and offshore platform access, workshops, ESTOC, and ROV²³/AUV²⁴ training programmes).
- Common cause with other Spanish, Canary Islands, and EU ocean universities and research institutions to mount major collaborative and multidisciplinary research proposals and programmes.
- Existence of funds from Foundations that foster funding for oceans (Moore Foundation, Packard Foundation).
- Partnering with international ocean agencies and national ocean observatories.

3.4.Threats

- Facility reliability and system maintenance given the hostile ocean and subsea environment.
- Securing and sustaining sufficient long-term operational funding.
- Ship access for essential maintenance and new deployments.
- Securing new capital funds to enhance the capability of the facilities.
- Ability to retain, retrain, and replace highly qualified personnel.
- Maintaining international competitiveness as other ocean observatory facilities are completed.
- Subject to legal alterations, new regulations, financial constraints, and governmental shifts, amongst others.
- Too many mandates and accountability chains.
- Oceans may not maintain a relatively high priority in Spanish, Canary Islands, and EU agendas.
- Fragmentation of Spanish research and educational institutions.
- Competition from and insufficient coordination with other EMSO-ERIC²⁵ observatories.

²³ Remotely Operated Vehicle

²⁴ Autonomous Underwater Vehicle

²⁵ European Multidisciplinary Seafloor and Water Column Observatory– European Research Infrastructure Consortium

4. Objectives 2017-2021

The objectives are based on general principles that are used as guides:

- committed to scientific excellence and technological innovation, service quality, integrating reliable data to be disseminated and disclosed whenever possible;
- agile and sustainable services in continuous improvement, evolving according to user needs; technology neutral, but supporting coherence and interoperability with national and European standards;
- friendly and open environment, attracting talent, providing a multidisciplinary and cross-sectorial meeting point and networks, well connected and promoting public and private cooperation between academia and industry, working together in line with national and international policies.

The main objectives of PLOCAN are regulated by the funding agreements²⁶. These state that PLOCAN should provide a unique infrastructure to the national and international scientific community to observe, study and test the processes affecting the conservation and sustainable use of the oceans and global change. It also includes integrated services to improve offshore technologies and stewardship of the ocean, based on ecosystem-based management and sustainable use of ocean resources. The knowledge and evolution of marine ecosystems, their conservation status and associated risks are essential topics in this approach. These general objectives will also be pursued during the next five year period (2017-2021).

Moreover, PLOCAN will activate, enhance and accelerate research and participation of national groups and centres in major international challenges, projects and programmes, providing unique scientific facilities and efficient value-added services to the scientific community, promoting multidisciplinary capabilities, clustering, transferring and outreaching knowledge to public and private research entities and, in general, to society as a whole. Furthermore, PLOCAN will promote the opening and development of new research fields that may give rise to new generations of technologies in ocean observation and information management. Observation of the marine environment is proliferating from the technological and instrumental advances in mechanics, electronics, information technology (IT) and telecommunications. New fields of study will be created based on new simultaneous observations, the integration of results, remote interactivity and observations in temporal and spatial scales of higher resolution. Counting on these observations is crucial for an accurate understanding of the processes that are taking place in the marine environment, in their interfaces with the sea bed and atmosphere, their dynamics and their global balances

For the period 2017-2021, the general structure of objectives has been revised, updated and focused to a greater extent around the main facilities (now operational) and the community of users. The facilities include the observatory, the marine test site and the multi-purpose offshore platform. They provide data and operations, and host services for experiments or new devices to a wide community of users. Thus, the building and construction priority objective in the previous plan, gives way to a general goal more focused on the services hosted and provided by these facilities. Besides, another pillar in the previous plan, environmental sustainability, is now embedded as a required commodity in all the operations and maintenance, once the policies, procedures and methodologies to ensure environmental sustainability have been initially developed and inserted as business as usual in the day to day operations. The other pillars related to science/technology, the continuous improvement of the management of the organisation and socioeconomic impacts are updated but kept as essential elements.

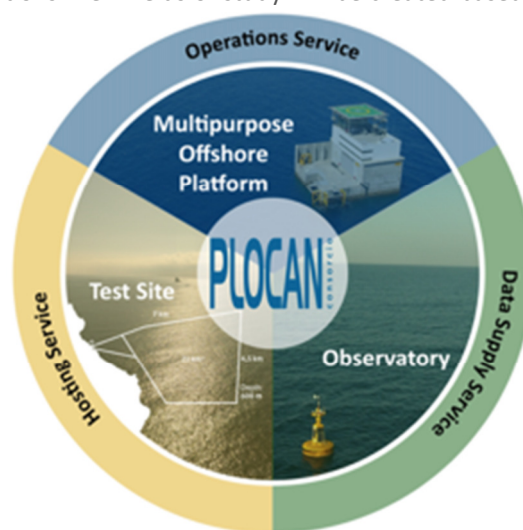


Figure 4 Services offered by PLOCAN

²⁶ The Cooperation Agreement "between the Ministry of Education and Science and the Government of the Canary Islands Autonomous Community to establish the Consortium for the Design, Construction, Equipment and Exploitation of the Oceanic Platform of the Canary Islands", signed initially on [December 10th, 2007](#) and revised in [2012](#) and [2015](#). These objectives were developed and evaluated by the Advisory Committee on Unique Infrastructures (CAIS - ACUI).

4.1. Description of the objectives

The general principles and objectives that will be followed to implement PLOCAN's 2017-2021 strategy pursue the following priorities:

- **Objective 1. To provide new services and facilities, especially offshore, including improvement in operations and capabilities demanded by the scientific community and industry.** The offshore platform and the test site facilities will provide multipurpose services for R&D&I integrating several blue growth activities (e.g. livestock and energy productions, safety, security or leisure). Furthermore, the platform will be used as a “*virtual ship*” and an “*offshore smart grid*” for some maritime and industrial initiatives such as testing shipping or innovative offshore technologies. The test site will also be used as a “*field lab*” for marine sensors (e.g. IoT²⁷) and for robotics. The offshore test site will also seek to accelerate the development of offshore technologies and overcome barriers to promote a more efficient and sustainable use of the oceans. PLOCAN will encourage the testing of innovative devices in the sea at higher TRLs²⁸ (>4) during the next period. The main objective will be the integration of activities and services, using renewable energy produced as a source of an offshore smart grid based on the platform, exploring technologies and new concepts to generate and use electricity offshore (e.g. charging marine vehicles, using new energy vectors, integrating observation for modelling, etc.), including deep waters. A key set of research topics and technologies pertinent to this objective will be:

 - a. Blue growth innovative research and enabling technologies to harness sustainably used ocean resources, including aquaculture, ocean renewable energies or leisure.
 - b. Marine and maritime robotics, including new platforms and sensor-payloads, reduced energy consumed or smart integration and inter-robotic cooperation (swarms model) to tackle complex and multidisciplinary challenges autonomously.
 - c. Environmental sustainability and ecosystem-based management of oceanic resources, including new technologies providing integrated data to improve marine spatial planning.
 - d. Clean and smart technologies in the maritime sector, including new fuels, safety or security, smart ports and logistics.
- **Objective 2. To provide standardised and accessible data and support for sustained observation in the Central Atlantic.** PLOCAN will provide new integrated data and information services for a better understanding of the Atlantic marine system, both in coastal and oceanic areas, fully aligned with the EOOS²⁹ vision to build a coordinated and connected European ocean observation community. PLOCAN will collaborate with national and international programmes and organisations to implement a more global-scale sustained observing system, driven by stakeholders' requirements, i.e. serving the needs of science, society, and innovation, providing new added value products and services. It will contribute to filling the gaps in the Central Atlantic area, prioritising the essential ocean variables (EOVs) approach, coordinating observations with the international community and using innovative technologies and promoting community-driven principles of Open Innovation, Open Science and Open to the World ([3Os Strategy](#)) and Responsible Research and Innovation ([RRI](#)). It will provide cost-efficient and innovative sensor systems and platforms, inter-operable ICT³⁰ solutions, higher resolution (spatial, temporal) through the increasing use of cost-effective platforms, and access to an integral observation system driven by inter-disciplinary requirements of connectivity, access, sharing and harmonisation. PLOCAN will provide coastal data, supported by test-site facilities in order to offer controlled environment, ocean data at the ESTOC station, and connected oceanic transects across the North-East Atlantic.
- **Objective 3. To provide an agile, flexible and fit for purpose organisation, able to respond efficiently to the unique nature of the challenges to be accomplished.** PLOCAN's internal organisation must be highly flexible and innovative; flexible to evolve to the user's needs, and oriented towards a competitive market, which is highly specialised and used to scientific and technological excellence and high-quality standards. Procedures should follow serviceable roles to attract and provide proficient

²⁷ Internet of Things

²⁸ Technology readiness level

²⁹ European Ocean Observing System

³⁰ Information and Communication Technologies

management of services and resources using European standards. The personnel have to be highly motivated and rewarded, as they are the key pillar to support the infrastructure. They should have a good knowledge of trends and prospects in the marine and maritime sectors, be highly connected and active in the interaction with current and potential users as well as to be able to participate and lead global initiatives while mobilising surrounding companies and ultimately fostering the creation of economic value and employment. The organisation must be excellent and well-structured in the management of its projects, its economic and financial resources, as well as in its human resources, in a way consistent with the requirements of the public sector. Transparency principles in its actions, accountability, high standards and quality controls, sustainability and minimal environmental impact for all its interventions, and a significant contribution to the principles of efficiency and effectiveness in public expenditure, are a must.

- **Objective 4. Increase socio-economic impact, stakeholder engagement, user communities, and diffusion of the knowledge and technology produced to society.** PLOCAN will contribute to industrial development, to accelerate the growth of the blue economy at European level but also to explore and demonstrate new niche markets in EU-peripheral regions, supporting pilot projects and initiatives. PLOCAN is fully committed to the valorisation of knowledge and technology, and to promoting innovation in order to create new jobs and provide value for overall social and economic development. PLOCAN will actively contribute to promoting national and international frames to support the testing of innovative prototypes, from new sensors and underwater vehicles, to energy converters to harness offshore renewable energies. Besides, it will help to analysis business models, new approval procedures, authorisation protocols or environmental studies. It will actively participate in national and international clusters, promoting entrepreneurship in the maritime sector and harnessing financial funding opportunities for potential users. It will also be developing ways to measure social and economic impact. And last but not least, outreach, diffusion and dissemination are essential to achieve public knowledge and awareness of R&D&I activity, increasing general public literacy on scientific and technological issues.

4.2.Strategies to achieve the objectives

The principal strategic approaches to achieve the objectives are listed below:

1. **Holistic approach:** To conduct an integral and holistic approach, converting the multidisciplinary nature of its facilities, services and users into a strategic advantage, a cross- sectorial ecosystem;
2. **User oriented:** To consolidate, promote and innovate facilities and services, working together with users or potential user communities, monitoring quality, examining performance levels and benchmarking services provided by the infrastructure. The culture of the organisation should reward and recognise the efforts to innovate and improve services, evolving according to the needs of users. The needs and requirements to provide these services with higher standards should be a priority to engage with the consortium bodies supporting PLOCAN;
3. **Collaborative:** To build-up partnerships with the leading national and international institutions (public and private) and initiatives pursuing a global approach to ocean research and developing marine technologies, such as networks, distributed infrastructures, clusters or similar actions. Special attention should be focussed on collaboration with national infrastructures (ICTS) European Research Infrastructures (ERICs), and with transatlantic initiatives or international initiatives related to islands or remote areas. PLOCAN has a global vision that can only be achieved working together in collaboration with institutions and countries based on heterogeneous and multidisciplinary research networks;
4. **Transnational:** To make the infrastructure more widely available to transnational and cross-border access, even outside of the EU, by working together with other countries to synchronise national research infrastructure roadmaps, funding systems and evaluation frames;
5. **Inclusive:** To operate in an open mode, promoting community-driven principles to release data produced with tax-payers' money, promoting an Open Innovation, Open Science and Open to the world (3Os Strategy) organisation;
6. **Stakeholder-driven:** To follow the principles of Responsible Research and Innovation (RRI) to work together with stakeholders, engaging them to identify synergies, find new opportunities, best practices and learn from experiences in other fields. At the same time, promoting services for different sectors, scanning gaps or new potential services, especially working with traditional and emerging users of the sea, finding compatibilities and synergies;

7. **Sustainable:** To find new ways to increase and make more efficient use of European funds (structural investment funds, the European fund for strategic investments, InnovFin – EU Finance for Innovators programme) or innovative instruments (public or private) to leverage funds in order to support testing; pilot projects in collaboration with industry or promote demonstration flagship initiatives, especially for SME technological developers, and other users;
8. **Cost-efficient.** To strengthen external support by working together with other public and private institutions that can provide on-time resources and services when speeding up the efficiency of PLOCAN's activity is required, while keeping the core added value and core knowledge in-house;
9. **Adaptive culture:** To keep the organisation in a continuously improving and learning mode, working together with stakeholders and communities of users, always looking for the innovative approach, rewarding new ideas, flexibility and adaptability to unique circumstances and opportunities;
10. **Literacy engaged:** To enlarge the diffusion, dissemination and general knowledge of results, approach and socio-economic impact, propitiating a more national and international outreach of services and added value among the scientific community, marine and maritime stakeholders, policy-makers and the general public and citizens. Scientific infrastructures have an inherent value for training, clustering, supporting entrepreneurship or using them as flagships for European science policy that it is not yet fully developed.

4.3.Strategy implementation (Planned actions)

ID	Action title	KPI ³¹
4.3.1	To continuously improve the organisational system, safety, security and operational costs. PLOCAN's administrative procedures are regulated and controlled by accounting, safety, security and quality management, among others. They will be continuously analysed to improve cost-efficiency, sustainability, safety and security conditions both in onshore and offshore operations to prevent potential risks for the organisation, the personnel, the users or the natural ecosystems. Equipment, hardware and software to fulfil those requirements will be procured. Detailed cost models and safety and security assessment will be performed to improve operating cost, assuring elements such as safety and security, the added value generated from facilities, services and the social and economic impact produced. This information is critical to establish the real cost of offering new facilities, renting, leasing or comparing services. Priority actions will be focus on safety and security investment, especially on the offshore.	<i>Number of managing procedures, cost model and safety and security procedures. Positive evaluation on security and safety evaluations. Acquisition of the require safe and security equipment.</i>
4.3.2	To attract talent and improve strategies to hire skilled and experienced personnel. PLOCAN will ameliorate the methodology and applications used for recruitment. The procedures should follow OTM-R ³² roles and the constraints of the legislation of the public sector in Spain. New actions will be addressed to attract and retain highly qualified national and foreign personnel by applying standards of the European Research Area of excellence. Moreover, PLOCAN will work on specific actions to improve the working and employment conditions of R&D&I in line with "Human resources strategy for researchers". PLOCAN joined the "The European Charter for Researchers" aimed at improving the recruitment of technical staff, and it was also designated as a point of contact for Euraxess-Researchers in Motion.	<i>Number of actions implemented and new hiring procedures implemented or ameliorated.</i>

³¹ Key Performance Indicator

³² Open, transparent and merit based-recruitment

ID	Action title	KPI ³¹
4.3.3	To adopt smart, connected and more sustainable ICT procedures. PLOCAN is an organisation based on knowledge, technology, connectivity, data and information. It will continue developing and implementing an intensive digitalisation process (including cybersecurity, business intelligence, cloud computing or use of customer relationship and knowledge management, among others) according to national and European regulations and standards. The actions will cover the entire production cycle, from the internal work and knowledge flow to monitoring processes and services to the relations with users by cloud-computing interactions or new web interactive service applications, to provide a permanent and more fruitful engagement with users and other stakeholders. It requires investment in equipment, primarily to deal with big data and connectivity or compatibility with requirements from other research centres and potential users, among others.	<i>Number of procedures, tools and new applications implemented.</i>
4.3.4	To connect PLOCAN service nodes to national and international distributed research infrastructures and networks. PLOCAN is part of several national and international networks and distributed infrastructures (e.g. the Spanish MARHIS ³³ -ICTS or RIM research infrastructures and EMSO-ERIC, MARINERG-i ³⁴ , MARINET2 ³⁵ at EU level). Membership requirements include special working procedures and shared methods, protocols, exchange or mobility of the personnel, strategic alignment and several joint actions, projects and initiatives. The measures to improve synergies and efficiency to operate within these networks is a primary priority. However, it will require time and resources to converge, taking into account issues like complying with different legislations, objectives, protocols or organisational cultures. A priority action is to comply with standard procedures, including MARHIS-ICTS, a research infrastructure that offers a combination of laboratory, numerical and field facilities, and is supported by several leading Spanish institutions in this field.	<i>User maps, users engaged in the dialogs</i>
4.3.5	To deliver an onshore innovation hub by refurbishing land facilities in order to offer users a service-oriented space with new capacities and interactions (e.g. labs and workshops, but also ICT connectivity, services to entrepreneurs or venues for events, etc.). The land base is a meeting and convening point for vibrant communities of users and stakeholders, open and flexible to user community needs. This space will be open to supporting services related to innovation, entrepreneurship around the knowledge or technology developed or attracted by the research infrastructure. It will support and help activities carried out in offshore facilities, including the offshore platform, test site and observatories.	<i>Number of users, and accomplishment of the work</i>
4.3.6	To offer new testing positions and services to host a broader range of marine technologies and prototypes, including the capacity of testing grid-connected devices to harness offshore renewable energy up to 15 MW. These new capabilities will allow collaboration with the European networks of marine energy test sites and the emerging integrated European research infrastructure for offshore renewable energies labelled on the 2016 ESFRI ³⁶ roadmap (MARINERG-i). The new hosting positions, including Underwater Electrical Transformation Devices, will allow pulling innovative ocean renewable energy devices and prototypes, related services or associated technologies during the whole cycle of the product. It will help to strengthen the Spanish and European, scientific and engineering excellence and expertise, by accelerating the testing of innovating public and private products and services across a large variety of MRE ³⁷ technologies and systems and through all key stages of technology development (TRLs).	<i>Release of MARINET2 and MARINERG-i deliverables.</i>

³³ Maritime Aggregated Research Hydraulic Infrastructures

³⁴ EU-H2020 Project acronym: "Marine renewable energy research infrastructure"

³⁵ EU-H2020 Project acronym: "Marine Renewable Infrastructure Network for Enhancing Technologies 2"

³⁶ European Strategic Forum for Research Infrastructure

³⁷ Marine Renewable Energy

ID	Action title	KPI ³¹
4.3.7	To provide new services, capabilities and sensors at the ESTOC oceanic station. The installation of a new surface and submarine modules at the ESTOC mooring that can provide detection of new variables and communication between the surface and underwater sensors, transmitting data in real-time and providing new capabilities. Furthermore, the installation of new sensors to detect EOVS, atmospheric variables, noise or geo-seismic variables will extend the services, and the scientific activities supported by the ESTOC station. The Eastern Central Atlantic regions are key for marine mammals, but poorly covered by acoustic sensors. The new capabilities will fill this gap, and provide insight into potential anthropogenic activity in the area. The geophysical modules will give data on geophysical hazards (tsunamis).	<i>Number of new capabilities installed and operational real-time data flow from water column</i>
4.3.8	To consolidate coastal observatory services. The installation of the 2 nd and 3 rd section of the cable observatory in the coastal test site and the installation of new devices such as LIDAR or HF radar systems and new sensors (e.g. acoustic sensors able to measure underwater ambient noise, track soniferous species like marine mammals, and measure underwater sound from ships) will support MSFD ³⁸ studies and capacities to develop IoT, improving access and connectivity (interoperability). The observatory will also be integrated into the regional node of EMSO-ERIC. PLOCAN will work with other Spanish institutions (IEO ³⁹ , CSIC ⁴⁰) to coordinate a Spanish joint action to integrate collaborative research initiatives within an EMSO-Spain specific programme. These activities will include the ESTOC station, the PLOCAN coastal test site and other Spanish sites and coastal observatories, such as OBSEA ⁴¹ .	<i>Number of new sensors and communication capabilities installed</i>
4.3.9	To offer new services associated with the oceanic platform. The tank will be equipped with automation and gate to ensure the security of the operations in the platform. It will provide new laboratory and observational services, and it will deliver capacities for new applications in the field of marine robotics, training, and opportunities for national and international collaboration in new actions, projects and initiatives. The tank and the platform will be the base for the glider school and the home base station for further testing services related with underwater vehicles with applications in safety, security, marine pollution and underwater surveillance, including the use of artificial intelligence or a swarm of sea drones.	<i>Number of users, projects and collaborations using the test tank, and accomplishment of the work.</i>
4.3.10	To offer new capacities, technologies and instruments. New robotics systems, including aerial, surface or underwater robotic systems, will be offered as observational or operational platforms for new sensors or technologies. Particular attention will be providing to low-cost swarms of smart drones operating innovative missions in the marine environments (e.g. emerging or traditional activities in the blue economy). They will also allow training and educational services, to maintain the educational leadership and the international reference position (e.g. the glider school).	<i>Number of users, and projects operating the facility and accomplishment of the work</i>
4.3.11	To enable the logistic and the service support to the sea operations. Sea capabilities and logistics are essential for the operational phase of PLOCAN. The activity on the platform and the test site is increasing and demanding daily sea support. Moreover, due to safety and security regulations, new mooring capabilities are necessary to provide the required support to sea operations. Additionally, transport and safety boat services are required to access the offshore platform, test site and to deploy/decommission instrumentation in the ocean. It will be essential to have capabilities to move standard 20 foot containers, where the staff will move from the port and the offshore platform.	<i>Number of users, and projects operating the facility and accomplishment of the work</i>

³⁸ Marine Strategy Framework Directive

³⁹ Spanish Institute of Oceanography (*Instituto Español de Oceanografía*)

⁴⁰ Spanish National Research Council (*Consejo Superior de Investigaciones Científicas*)

⁴¹ Expandable Seafloor Observatory

ID	Action title	KPI ³¹
4.3.12	To prepare new actions, initiatives and projects to explore and demonstrate the combined use of the ocean space or multiuse offshore infrastructures. The space at sea should be used efficiently and sustainably, avoiding conflict among users. PLOCAN will promote the harnessing of marine resources, using multipurpose solutions, including the combination of emerging blue growth activities with more traditional applications (e.g. fishing, shipping or leisure).	<i>Number of actions, initiatives and projects prepared and successfully accomplished</i>
4.3.13	To provide services to large and complex sea experiments. Several users and projects (e.g. KOSMOS ⁴² , OCEAN ARTUP ⁴³ , etc.) are demanding oceanic space to study and test large complex devices or multipurpose experiments, where technology, mechanisms and processes in the open marine environment are integrated, such as the impact of ocean acidification or artificial upwelling. PLOCAN will provide new capabilities and services around those topics, including the facilities to carry out the experiments, and tailoring the facilities to provide the best solutions or additional equipment required (e.g. pumping system to upwell deep water) and delimit their potential environmental impact.	<i>Number of users, and projects operating the facility and accomplishment of the work</i>
4.3.14	To provide offshore smart grid services and capabilities. The offshore platform will be equipped with new capabilities to operate as a smart grid, acquiring the necessary equipment and cables to transport, transform or store energy from renewable sources in the sea and to deliver it to the grid or to use offshore in a smart way. The platform itself will be used for testing, demonstration or implementation of innovative projects to improve functionalities of smart offshore grids, the supply of electricity offshore or to transform it into other energy vectors, including chemical storage as water, hydrogen, ammonia or other viable industrial products.	<i>Number of users, and projects operating the smart grid and accomplishment of the work</i>
4.3.15	To promote testing of innovative technologies to harness marine energy resources in pilot projects on islands. PLOCAN will promote testing of emerging technologies and business cases, including pilot and demonstration projects on islands and in isolated coastal zones. It will improve offshore-land electrical connection, expanding and improving onshore support and services. PLOCAN will support projects to accelerate the roll-out of the technologies tested on the test site and will collaborate with local, national and international institutions to demonstrate pilot initiatives to de-risk investments and validate economic, technical, environmental and social feasibility of marine energy.	<i>Number of users, and projects operating the facility and accomplishment of the work</i>
4.3.16	To collaborate on demonstration and pilot projects related to offshore wind energy technologies, including environmental aspects. PLOCAN will collaborate in testing and demonstration of elements associated with the value chain of the offshore wind industry, including future floating devices or substructures in cooperation with institutions all over the world. The social, environmental and regulatory issues are also a priority associated with the technology. PLOCAN will provide the industry and research groups with opportunities to test technologies during the life cycle and non-technological aspects (e.g. environmental requirements) associated with the value chain, helping on new projects, pilots or demonstrations. PLOCAN will also collaborate with public-private initiatives, industrial projects to exchange knowledge and best practices, primarily related to deep water innovative foundations, floating substructures, authorisation, approval, environmental impacts or business models.	<i>Number of users, and projects operating the facility and accomplishment of the work</i>

⁴² The Kiel Off-Shore Mesocosm for future Ocean Simulations

⁴³ EU-H2020 Project acronym: "Ocean Artificial Upwelling"

ID	Action title	KPI ³¹
4.3.17	To extend the services and capacities of the observatory in the Atlantic area. PLOCAN will collaborate in national and international initiatives to develop new platforms and observational capabilities in the Atlantic area, especially in collaboration with Atlantic basin countries in Africa and America, but also in cooperation with EU initiatives developed under the Galway and the Belen statement. Moreover, it will continue increasing regional collaboration in the Macaronesia area, associated African countries and the Atlantos community (and the blueprint delivered), providing cooperation to SDGs ⁴⁴ in the central Atlantic area. PLOCAN will also promote specific actions to promote international cooperation in this area, including training and capacity building.	<i>Number of users, and projects operating the facility and accomplishment of the work</i>
4.3.18	To launch new national and international access calls to the facilities in cooperation with national and international institutions. Some calls will be launched in cooperation with international projects (e.g. EMSOLINK ⁴⁵ , EU-CELAC ⁴⁶ initiatives, etc.) while annual calls to the facilities will be supported by PLOCAN's permanent open access call .	<i>Number of calls and number of users.</i>
4.3.19	To update the service marketing action. PLOCAN will organise a set of actions such as events, workshops, focus groups and international presentations in key meetings at national and international events. The promotion of the service will be performed based on the experience gathered from users. The actions will be carried out in collaboration with other infrastructures (e.g. EMSO, MARISH) and networks (MARINET) using a combined strategy to promote the role of the infrastructures in the European Research Area.	<i>Number of actions and number of attendees</i>
4.3.20	To update the map of users , including new potential users, to develop a permanent and structured dialogue to capture experience of users, to detect needs and opportunities, and to improve services and detect gaps and areas to improve quality. To enlarge potential users, it is important to map and identify the broad and diverse communities of potential users, in fields such as ocean observation, offshore renewable energies, robotics, offshore engineering, etc.	<i>Number of user maps, number of users engaged in structured dialogs and number of new users</i>
4.3.21	To enhance multi-sectorial stakeholder engagement. PLOCAN will approach selected agents in the value chain of maritime related sectors (such as ocean observation, offshore renewable energy, marine livestock, underwater robotics, marine pollution, marine spatial planning, safety and security and offshore engineering, among others) to detect collaboration opportunities and provide innovative value-added services. As an example, the entire value chain should be considered for ocean observation, including the role of new platforms, sensors and data assimilation procedures, big data tools to provide new applied services to test sensors, platforms, models, IoT in the marine environment, to measure new variables or applied data to emerging fields.	<i>Number of joint stakeholders engaged, knowledge outputs captured, new services and new projects or derived action implemented.</i>
4.3.22	To implement business innovation actions in the field of marine maritime technologies, increasing compatibility between traditional and new uses. PLOCAN will promote a new collaborative culture to use the marine environment, through pilot and demonstration projects that will show compatibility and advantages of simultaneous use of marine space between traditional and emerging sectors. Technology and knowledge, including sensors, instruments and applications will provide experimental evidences of sustainable environmental monitoring.	<i>Number of users, and projects operating the facility and accomplishment of the work</i>

⁴⁴ Sustainable Development Goals

⁴⁵ EU-H2020 Project acronym: "Implementation of the Strategy to Ensure the EMSO ERIC's Long-term Sustainability"

⁴⁶ European Union - Comunidad de Estados Latinoamericanos y Caribeños

ID	Action title	KPI ³¹
4.3.23	To update the communication plan and develop new actions through the PLOCAN Scientific Culture and Innovation Network. The communication plan should be updated to broaden coverage, increase the contents provided by the experience gathered from the operational phase or the results produced by users, among others. Additionally, new dissemination channels should be updated responding to the impact measured from previous activities and information acquired from the interaction with users and other stakeholders. A regular source of structured information should be organized from the knowledge output generated by projects in which PLOCAN is involved and interactions with its associated partners.	<i>Number of scientific dissemination events and news on the PLOCAN website</i>
4.3.24	To promote and collaborate to promote blue economy. PLOCAN will develop actions to accelerate blue economy, working together with partners in the Macaronesian Region, in the Atlantic Basin and international organisations such as OECD ⁴⁷ . PLOCAN will work with stakeholders on efforts to improve the transfer of knowledge and technology to the private sector, including environmental studies, application of enabling technologies and overcoming non-technological barriers. These actions will gather the experience and best practices in the global marine and maritime sector, together with results produced by PLOCAN's users to boost local and European socio-economic impact. PLOCAN will work jointly with public and private agencies to promote new 'blue' jobs and sustainable industrial growth in the marine and maritime sectors.	<i>OECD Report. Number of actions performed to boost Blue Economy</i>
4.3.25	To update the training programmes. PLOCAN will enhance the training programs, offering focused training to personnel, users and general public. It will collaborate with Universities and research centres to host internships, PhD thesis or final project-like experimental work. It will also promote training positions and thematic courses (e.g. Glider School). A specific training program will be addressed to young students to motivate technological carries, providing training and competition activities.	<i>Number of users, and projects operating the facility and accomplishment of the work</i>

4.4. Main risks of the actions

ID	Action title	Mitigation actions
1	Competition with other infrastructures including similar marine research services	Improve service quality Increase commercial visits
2	Structural damage produce by storms, harsh weather, or ships operations and elements	Include protection elements Increase preventive maintenance
3	Platform impact and/or losses in structural elements	Increase maintenance Improve monitoring system
4	Change of priorities in investment policies of founding institutions	Raising external resources Attracting users Modelling a singular organization
5	Lack of specialized providers and delays in supply chain	Edition of public tenders Equipment compatibility Specific tender procedure
6	Heavy bureaucratic management (administrative barriers) due to hindering agreements, contracts and business opportunities	Legal adaptation and procedures improvement Staff expansion
7	Lack of incentives for hiring and maintaining specialised staff in the organisation	Improving the employment system Technical capacities analysis
8	Cybersecurity incidents in internal IT systems due to lack of corporate culture using ICT Tools	Improve the technology management internal procedures Integration with the National Cybersecurity System Improve the cybersecurity service

⁴⁷ Organisation for Economic Co-operation and Development

ID	Action title	Mitigation actions
9	Restrictions due to safety and security risks in offshore operations	Staff training Increasing the maintenance
10	Uncertainties related with national and international collaborations due to high degree of dependence on partners	Update of the stakeholder engagement procedure Maintain the presence in international R&D&I actions

4.5. Resources

Once again, PLOCAN enumerates in first place the human resources available within the organization, to carry out the tasks, which will help to reach the goals that have been described above. The human factor is considered to be the most valuable factor of the organization's resources, and its greatest strength, counting with highly recognize expertise, competence and experience in international collaboration with researchers and diverse entities. There is however, due to harsh regulations and budget constraints, a lack of a defined career progression or promotion for the staff. At the end of 2016, the staff at PLOCAN was composed of 30 permanent employees hired by the consortium. The gender percentage was 44% female/56% male.

PLOCAN has kept on working in the promotion, strengthening and consolidation of a system of gender equality in all areas of the organization, based on non-discrimination and equal opportunities. It was forecasted in our Scientific-technical project that by 2011, PLOCAN would include a workforce of 56 employees. However, a decrease in funds and legal restraints still situates the planned prevision well under expectations. For the new period, and after the entrance in operation of the main facility, the offshore multipurpose platform, PLOCAN needs to enlarge the permanent staff reaching at least 40 permanent employees in order to accomplish the objectives described.

As the Oceanic Platform of the Canary Islands is an ICTS co-financed by the Spanish National Government and the Regional Government of the Canary Islands, the main funding for PLOCAN comes primarily from contributions made by the central and the autonomous governments. The income forecast for the coming years has been set out in the agreement of 2015 with the Autonomous Government of the Canary Islands (CAC) for the modification of the Collaboration Agreement to create the Consortium for the Design, Construction, Equipment and Exploitation of the Oceanic Platform of the Canary Islands. It includes the provision of the fixed contributions that MINECO and CAC will make to the Consortium, which will be distributed according to the following table:

Table 1 Income forecast fixed by MINECO and CAC for the next few years

	2017	2018	2019	2020	2021	Total
MINECO	€843,762	€818,920	€793,582	€767,736	€741,374	€3,965,374
CAC	€1,242,091	€1,266,933	€1,292,271	€1,318,117	€1,344,479	€6,463,891
Total	€2,085,853	€2,085,853	€2,085,853	€2,085,853	€2,085,853	€10,429,265

These incomes must support the costs of operation, maintenance and general expenses, which are estimated in 8.5M€ for personnel, and 5.6M€ for general expenses for the period 2017-2021.

In addition to the mentioned income, as mentioned in the collaboration agreement, PLOCAN was to obtain from the MINECO, 3.150.000€ for financing specific investment innovation activities, as well as 575.250€ from the Canarian Government for the refurbishment of the land headquarter.

PLOCAN also has a land based headquarter, which was ceded by the Canarian government. It consists of office buildings, laboratories, workshops, conference halls, multipurpose rooms, containers area, machinery park, etc. Also, it has a port area with berths for the operational vessels and storage warehouses.

5. Schedule and monitoring

5.1. Schedule

Action ID	Action title	2017				2018				2019				2020				2021			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
4.3.1	To continuously improve the organisational system, safety, security and operational costs																				
4.3.2	To attract talent and improve strategies to hire skilled and experienced personnel																				
4.3.3	To adopt smart, connected and more sustainable ICT procedures																				
4.3.4	To connect PLOCAN service nodes to national and international distributed research infrastructures and networks																				
4.3.5	To deliver an <i>onshore innovation hub</i>																				
4.3.6	To offer new testing positions and services to host a broader range of marine technologies and prototypes																				
4.3.7	To provide new services, capabilities and sensors at the ESTOC oceanic station																				
4.3.8	To consolidate the coastal observatory services																				
4.3.9	To offer new services associated with the oceanic platform																				
4.3.10	To offer new capacities, technologies and instruments																				
4.3.11	To enable the logistic and the service support to the sea operations																				
4.3.12	To prepare new actions, initiatives and projects to explore and demonstrate the combined use of the ocean space or multiuse offshore																				
4.3.13	To provide services to large and complex sea experiments																				
4.3.14	To provide offshore smart grid services and capabilities																				
4.3.15	To promote testing of innovative technologies to harness marine energy resources in pilot projects on islands																				
4.3.16	To collaborate on demonstration and pilot projects related to offshore wind energy technologies, including environmental aspects																				
4.3.17	To extend the services and capacities of the observatory in the Atlantic area																				
4.3.18	To launch new national and international access calls to the facilities																				
4.3.19	To update the service marketing action																				
4.3.20	To update the map of users																				
4.3.21	To enhance multi-sectorial stakeholder engagement																				
4.3.22	To implement business innovation actions in the field of marine maritime technologies, increaing compatibility between traditional and new uses																				
4.3.23	To update the communication plan and develop new actions through the PLOCAN Scientific Culture and Innovation Network																				
4.3.24	To promote and collaborate to promote blue economy																				
4.3.25	To update the training programmes																				

Figure 5 Schedule of the planned actions

5.2. Monitoring indicators

Actions will be monitored using the KPIs described in section 4.3

Signed by:

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Director of the Oceanic Platform of the Canary Islands