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NATIONAL OCEAN STRATEGY 2021-2030



The National Ocean Strategy 2021-2030 is based on promoting healthy oceans in order to maximize sustainable blue development and the well-being of Portuguese people, setting Portugal as a leader in science-based ocean governance.

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FOREWORD



Ricardo Serrão Santos
Minister of the Sea

Few political issues are more consensual in Portugal than the strategic importance of the ocean. Political parties acknowledge it, as do academics, business leaders, NGOs and the society at large.

Portugal has published its first National Ocean Strategy in 2009, and, since then, this has been our main strategic document for public policy in maritime affairs. Consecutive governments have strived to improve it, monitor its results, set up implementation plans and ensure widespread adoption of its guidelines by the main stakeholders.

This third National Ocean Strategy, approved by the Portuguese Government, will be in force from 2021 until 2030. It is the result of a highly participated process

of public consultations, that lasted for a few months and mobilized thousands of participants from all over the country.

Portugal is an archipelagic country facing the Atlantic, with approximately 4 million square kilometers of territory to manage. The two autonomous regions, Azores and Madeira, are responsible for much of Portugal's oceanic dimension. With this geography, we are prompted to contribute to global solutions to the ocean's problems, to build a truly sustainable blue economy and to protect the marine environment. I hope this strategy will serve as an inspiration to reaching these ends in the coming years.

FOREWORD



Helena Vieira
Director General for Maritime Policy

The Human way of living on Earth has changed. In today's world, our freedom, our economies, and our societies have been devastated by the COVID-19 pandemic; the climate crisis is undeniable, and its effects are constantly multiplying. New ideas and sustainable solutions are needed for a better and brighter future on this planet, and the ocean must play a vital role.

In a critical time of strategic importance for Portugal, with the response to the pandemic, and the negotiation of the Recovery and Resilience Plan and European funds, the National Ocean Strategy (NOS) 2021-2030 takes on a significant role, operating as a guideline for ocean policies and investments, both public and private. It is a script that reflects a new way of co-living in and from the Ocean.

The development of this Strategy was made through a collaborative and fully inclusive process, where we sought to actively listen to citizens, beyond the organizations and entities themselves. After a broad public consultation, with

multiple sessions across the country and thousands of participants, we have reached to this document, in an accessible format, that we hope can be useful for everyone.

In this new NOS 2021-2030 we fully acknowledge the role of scientific knowledge and of the undeniable need of a healthy ocean as essential pillars for a sustainable blue development. With this strategic document for Portugal, we seek to provide answers to build the future we want through our greatest national asset, the ocean. We cannot continue in a "business as usual" model, developing economies at the expense of the planet's depletion. We cannot be simply anthropocentric. We must be ecosystemic. And so, in line with the mission and spirit of this Directorate-General for Maritime Policy - "Framing a path to our Ocean" - we know this is the only path forward!



1. INTRODUCTION

Portugal is an oceanic country, with a coastline of approximately 2,500 km. Its Exclusive Economic Zone (EEZ) is one of the largest worldwide, spanning 1.7 million km² and including a myriad of ecosystems and resources. The Portuguese maritime triangle (Continental Portugal plus the Azores and Madeira archipelagos) represents 48% of all maritime waters under the jurisdiction of the Member States of the European Union (EU) in areas adjacent to the European continent. Additionally, the Portuguese continental shelf is extremely important, with its delimitation beyond 200 nautical miles currently being revised within the United Nations (UN). The purpose is to increase the area encompassed by the maritime space under Portuguese sovereignty or national jurisdiction to 4.1 million km², expanding the sovereignty rights beyond the EEZ for purposes of conservation, management, and use of the natural seabed soil and subsoil resources. This will make Portugal an even more Atlantic nation.

The return to the ocean was the great enterprise launched by Portugal in the late 20th century, and it continued into the 21st century. This was inspired not only by the nation's maritime history and culture, but mostly by the current vision that the ocean is essential to life on earth and to society as a whole. Moving into the third decade of the 21st century we renew the importance of this commitment and of the visionary progress Portugal has shown since the end of last century.

In the 20th century, Portugal launched the Programme for the Enhancement of Marine Sciences and Technologies, published the Report «The Ocean – our future», and held the World Exhibition of 1998, which brought the ocean into society. Later, in the 21st century, there was a transformative proposal from the Strategic Commission for the Oceans, followed by two National Strategies for the Ocean, and also the 2009 report “*Hypercluster of Ocean Economy*”. Regarding clusters, we cannot fail to mention Ocean XXI and the Business Forum for the Ocean Economy, that merged into the Ocean Forum. Also worth noticing is the PwC initiative to launch its “Ocean Economy Barometer” and the *Excellens Mare* awards.

As we go through this 21st century, we must acknowledge our progress, although we have fallen short of our ambitions. This is partly because the international framework, and, albeit on a minor scale, the European

one, failed to prioritize the ocean, particularly regarding investment and allocation of financial resources, its cultural dimension, and its inclusion in global action agreements acknowledging its importance.

The emotional and rational bond to the ocean, as well as the political recognition of its vital role, were not given the deserved relevance in an international context. Only a few countries, among which Portugal, gave it the necessary relevance.

Over the past five years, the “political ecosystem” regarding ocean affairs has seen an international epistemological breakthrough:

- 1) In 2015, the UN published their first report on the “Regular Process for Global Reporting and Assessment of the State of Marine Environment, including Socioeconomic Aspects”, thus launching a cycle of regular “World Ocean Assessments”. This assessment was followed by a second one in 2017, approved during the 75th session of the UN General Assembly;
- 2) For 25 years, the agendas of world development goals, beginning in the 1990s with the Organisation for Economic Co-operation and Development (OECD) 7 International Development Goals and followed by the UN 8 Millennium Development Goals in 2001, failed to include the ocean as a goal or target. However, in 2015, the UN Sustainable Development Goals (SDGs), included in the 2030 Agenda for Sustainable Development, incorporated for the first time – with a contribution from Portugal – an autonomous ocean-related goal, SDG 14 – Conserve and sustainably use the oceans, seas, and marine resources for sustainable development. Shortly thereafter, the UN announced the Decade of Ocean Science for Sustainable Development, as well as the Decade of Ecosystem Restoration, both to be implemented between 2021 and 2030;
- 3) In 2018, the heads of state and government of 14 countries, including Portugal and Norway as the sole European nations, established the High-Level Panel for a Sustainable Ocean Economy, where business opportunity and financial investment are central to the development of the blue economy;
- 4) In 2019, the Intergovernmental Panel for Climate change (IPCC) published its first report on the ocean (and cryosphere). The conference cycle “Our Ocean” started in 2014. The first UN Ocean Conference was held in 2017, and the second was

scheduled to take place in Lisbon in 2020 but was postponed due to the COVID-19 pandemic. In 2019, the OECD launched the “Sustainable Ocean for All” initiative, and published its first report in 2020;

- 5) In 2020, the UN Environment Programme published its first report on carbon-sequestering coastal marine habitats titled “Out of the Blue”;
- 6) For 2021-2027, the EU’s research and innovation programme, which is one of the five missions of the Horizon Europe Programme, focuses on the ocean (Healthy oceans, seas, and inland waters), thereby significantly contributing to the EU’s Green Deal, part of the European commitment to implement the UN 2030 Agenda. In 2020 the EU also created the BlueInvest fund and the Blue Bonds.

The international ocean agenda gained new momentum and a new dimension over the past five years. Over the 2021-2030 decade, the ocean will again be the focus of environmental, social, economic, and geopolitical dimensions, as the world is acknowledging the vital relevance of the ocean for humans and the planet alike. The National Ocean Strategy 2021-2030 (NOS 2021-2030) is founded upon the several international instruments and contributes to its goals, while simultaneously reasserting the ocean as an area of sovereignty. It is crucial that we keep focused on ocean policies and bolster the geopolitical and geostrategic positioning of Portugal. The NOS 2021-2030 benefitted from the knowledge gained from the assessment of its two predecessors and it is still the main political tool that guides ocean policy in Portugal. It further serves as framework for the specific traits of the Autonomous Regions of the Azores and Madeira, whose potential vulnerabilities and opportunities are unique, both at national and European levels, namely in the monitoring of policies for the outermost regions.

In 2013, the Calouste Gulbenkian Foundation launched the Gulbenkian Oceans Initiative and for the following five years it developed activities in the areas of knowledge, environmental awareness, and management policies. More recently, in 2017, the first private foundation dedicated to the ocean was established, the Oceano Azul Foundation. This Foundation shows the renewal of Portuguese influencing capacity by taking on the leadership of clusters in international organizations. Finally, in the “Strategic Vision for the Economic

Recovery Plan of Portugal 2020-2030”, drafted by Professor António Costa Silva, the ocean is again a key element and acts like a catalyst.

Part of this renewed political momentum stems from the growing knowledge that ocean-related economic activities play a pivotal role in creating wealth and jobs. All over the world, people and their political representatives have become aware of the value and economic potential of the ocean and of how vulnerable it is to human activities. In 2012, the EU approved the “Blue Growth” strategy, one of the pillars of the Integrated Maritime Policy. Its goal was to support the sustainable growth of the ocean economy sectors by acknowledging how important seas and oceans are as drivers of European economy and also their huge potential for innovation. Portugal started monitoring the economic relevance of the ocean in the domestic economy through the Ocean Satellite Account, which resulted from a protocol between Statistics Portugal - INE and the Directorate General for Maritime Policy - DGPM signed in 2013. In 2018, the ocean economy accounted for 5,1% of our Gross Domestic Product (GDP), 5% of domestic exports, and 4% of jobs. These numbers are among the highest in the EU.

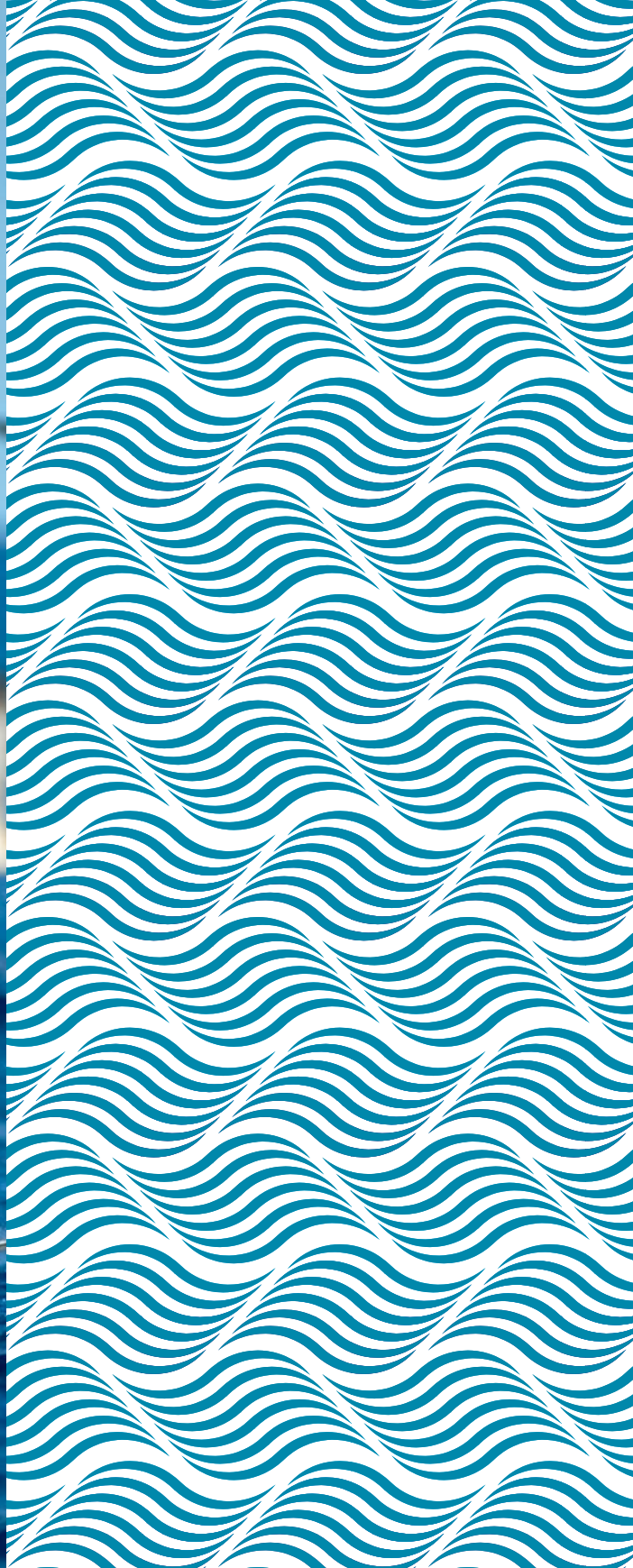
All over the world, people and their political representatives have become aware of the value and economic potential of the ocean and of how vulnerable it is to human activities.

The sustainability of the blue economy depends on the conservation of the marine environment and on the services of its ecosystems, as well as on safeguarding Portuguese maritime heritage, in line with the National Strategy for the Conservation of Nature and Biodiversity 2030. The Baseline for the Planning of the National Maritime Space and the Strategic Guidelines and Recommendations for the Implementation of a National Network of Marine Protected Areas, both approved in 2019, as well as the assessment of Good Environmental Status of Marine Waters recently reported pursuant to the EU’s Marine Strategy Framework Directive, are important benchmarks in ensuring our commitment to the defence of marine ecosystems and of the cultural nautical and underwater heritage. The Portuguese commitment to the protection of the marine environment

and to the sustainability of ocean-related economic activities acts as compass for the country’s positioning in international bodies and agreements it is a part of.

Portugal must assume the competitive advantages of its geostrategic location, technological skills, and maritime tradition, cutting down on administrative or tax constraints that can be detrimental to the former, and must invest in qualifying human resources and use the state’s authority over the ocean. Our pattern of sustainable management will be a decisive contribution to the sustainability of our planet in the bluer future we aspire for the next generations.





2. STATE OF THE ART

When defining a strategy, it is important to know where the start and finish lines are set. Just as important is the ability to learn from experience, namely by analysing the effect of previous strategies and their respective measures and implementation plans.

The implementation of the predecessors to the NOS 2021-2030 was closely monitored. Their impact, especially after 2013, was closely followed-up through a set of economic and social indicators included in the Annual Reports of the Ocean Economy, the result of a partnership between DGPM, INE, and other public institutions owning relevant information, project SEAMInd (National Ocean Strategy indicators and support monitoring), and annual integrated monitoring reports on the use of European Structural and Investment Funds for the sea (ITIMar). Data from the Ocean Satellite Account are also a key component for the follow-up and analysis of the impact of public policies, as they allow for an integrated macroeconomic vision of the ocean economy.

Based on this monitoring, we know that ocean economy accounted for 5.1% of the GDP and 5% of domestic exports in 2018. That same year, the Gross Value Added (GVA) of ocean economy was 7.2 billion euros and the exports of sea products amounted to 4.5 billion euros. In 2016-2017, 53 organisations were identified as active in ocean economy. In 2016-2018, the ocean economy had a better performance than the national economy, representing 3.9% of the GVA and 4% of jobs (2016-2017) at national level. The ocean economy had a growth of approximately 18.5% of GVA and 8.3% of jobs, almost twice as much as the national economy as a whole (respectively 9.6% and 3.4%) in that same period. In 2010-2013, in the aftermath of the global financial crisis, the Portuguese ocean economy performed better than the national economy. During that same period, while the national economy shrunk significantly with a GVA reduction of 5.4%, the GVA of ocean-related sectors grew by 2.1%; moreover, employment in ocean-related sectors shrunk at a smaller scale than that of the remaining economy (3.4% vs. 10%).

We can see that the increase in the relative weights of GVA and employment reflects the growth in the sea-related activities, whose GVA and employment had increases of 128.6% and 51.7%, respectively, when compared to 2010-2013 values, benefitting of the momentum

in tourism. The reports of the Ocean Satellite Account published so far show the steady and consistent path that ocean economy has followed when compared to other economic sectors. Supported by the increase in external demand, the surplus of sea products increased by 53.4% between 2016 and 2018 in a sharp contrast to that of national trade, which dropped by more than 55.7%. An analysis of the more representative sectors in ocean economy also showed favourable trends over the past decade.

The ocean economy had a growth of approximately 18.5% of GVA and 8.3% of jobs, almost twice as much as the national economy as a whole...

The fisheries sector (fishing, aquaculture, fish processing, and commerce of fish products) represented 1.8 billion euros of GVA in 2018 and 62,300 jobs in 2017. Between 2013 and 2019, the number of licensed ships and the number of registered fishermen decreased by 14% and 13%, respectively. The value of unloaded fish increased by 3% and the value of catches increased by 17%, whereas the volume of catches decreased by 5%. Between 2013 and 2018, aquaculture production and sales grew by 41% and 124%, respectively.

In 2019, there were 14,617 registered fishermen and 3,902 licensed ships in the fishing sector, which is equivalent to 50.2% of total ships, 86.1% of total gross tonnage, and 81.6% of total fleet power. The total catch of the Portuguese fleet was 188,537 tonnes (43,841 in international waters and 144,696 in national waters). Fish landings, both in national and non-national ports, reached the 171,717 tonnes (86% fresh fish and 80% in national ports). Out of the total catch, 137,669 tonnes were fresh or chilled fish sold at auction for 295.3 million euros. That same year, the exports in the fisheries sector (fishing and aquaculture products plus frozen and canned fish) accounted for approximately 1.8% of the total Portuguese exports.

In 2018, total aquaculture production was 13,992 tonnes and sales generated revenues of 96.8 million euros. Production in transition and marine waters remained predominant, representing 95% of total production (9,400 tonnes of molluscs and crustaceans plus 3,860 tonnes of fish). The industry processing fish products reached a total production of 220,000 tonnes (52.7% frozen, 25.5% dry and salted,

and 21.8% preparations and canned products) and grossed 1,067 million euros. These numbers show a decrease of 10.5% in the amount produced, but an increase in sold values of 25.7%, when compared to 2013.

Non-living marine resources represented 60 million euros of GVA (2018) and 1,720 jobs (2017). In 2019, production of sea salt in mainland Portugal was 108,000 tonnes for a total area of 1,112 hectares, representing an increase of 16.2 tonnes (+17.8%) and 157 hectares (+16.4%) in the production amount and production area of sea salt, respectively, when compared to 2013.

The activity of ports, transportation, and logistics amounted to 745 million euros of GVA (2018) and 12,173 jobs (2017). In 2019, ports in mainland Portugal moved through 86 million tonnes, 1.6 million containers, and 2.7 million TEU (Twenty-foot Equivalent Units) of cargo capacity, thus growing by 9%, 18%, and 24% in relation to the values obtained in 2013.

Recreation, sports, culture, and tourism reached 3.2 billion euros of GVA (2018) and 78,195 jobs (2017). This set of activities was the main generator of added value in the Portuguese ocean economy, mostly due to the dynamics of coastal tourism that represented 43.1% of GVA of the ocean economy in 2016-2018, in line with the 35.5% of GVA obtained by these activities in 2010-2013. In 2019, cruise tourism had 903 stopovers in Portugal, with approximately 1,436,000 passengers, a reflection of the increase in tourism demand. In 2020, in coastal parishes, there were 2,543 registered tourism entertainment companies (65, in 2013) and 906 operators (36, in 2013). In that same year, of the 488 coastal and transitional beaches in Portugal, 95.6% (460) were classified as of excellent quality (413, in 2013; 91.9%). In 2019, 1,367 recreational boats were registered, a record number for the decade and more than twice the number registered in 2013 (610); in addition, 12,123 recreational sailing licenses were issued. Still in 2019, 187,894 recreational fishing licenses (+13.5% than in 2013), with a predominance of angling licenses (71.6% and 56% of the total licenses issued in 2013 and 2019, respectively).

The construction, maintenance, and repair of ships represented 164 million euros of GVA (2018) and 4,883 jobs (2017), while the supply of maritime gear represented 217 million euros of GVA (2018) and 6,955 jobs (2017). Marine infrastructures and construction works represented 284 million euros of GVA (2018) and 6,455 jobs (2017).

Over the same period, maritime services represented 755 million euros of GVA (2018) and 16,247 jobs (2017).

The GVA of activities regarding the new uses and resources of the ocean (including emerging activities such as marine biotechnology, renewable ocean energy, and land observation services) reached 8 million euros (2018) and 351 jobs (2017). Until 2020, four licenses for the Private Use of National Marine Area were issued for the production and testing of renewable ocean energy with an installed capacity of 25.42 MW.

Science, innovation, and technology had a crucial role in building a technology-based and innovative entrepreneurial network with an emphasis on qualified employment. Between 2014 and 2019, expenditure in research and development (R&D) in the ocean economy represented 3.6% of total domestic R&D expenditure (433.6 million euros). Higher-education institutions represented 64.4% of this number, followed by the state (20.7%), private companies (14.7%), and non-profit private institutions (0.2%).

Over the past decade there was a bolstering of national and European financing instruments dedicated to scientific research and to the ocean economy. Until late 2019, the investment in ocean economy was materialized in the support given to 5,241 operations occurring in the ocean, totalizing about 2.6 billion euros, under the umbrella of the Portugal 2020 Programme. Between 2017 and 2020, the Blue Fund committed 34.3 million euros to support projects in blue economy, scientific research, marine environment protection, and maritime safety. The EEA Grants launched a new cycle (2014-2021, extended until 2024) with substantial improvement of the programme devoted to ocean research, which was allocated 44.7 million euros, thereby representing the largest programme of this European Community mechanism in Portugal (by late 2020, 10.6 million euros were already committed). Also under the EEA Grants, Portugal purchased its new oceanographic vessel “Mário Ruivo” and its refitting with modern technology. This enabled the expansion of Portugal’s scientific research on marine geotechnics, oceanography, operations with ROVs (remotely operated vehicles), geophysical surveys, and trawling.

The 78 million euros invested by the Ministry of the Sea in 2013-2020, through its State Laboratory, the Portuguese Institute for Sea and Atmosphere - IPMA, allowed promoting scientific research, technological development and innovation in the ocean, as well as managing the good conditions of maritime area under Portuguese jurisdiction.

The success of the strategies that predated NOS 2021-2030 is not exclusively measured by economic and financial indicators. The active mobilization of civil society through ocean literacy has been set as a priority, namely by expanding the outreach of the Blue School program. Within the scope of the School Sports program of the previous NOS, the Directorate General for Education established 13 Water Sports Training Centres (WSTC) that were used by 9,000 school-aged children. The 59 WSTC now in operation offer canoeing, surfing, sailing, and rowing lessons and activities to more than 80,000 children every year in sea, rivers, lakes, and lagoons all over the country. In 2020, 32,000 children, 2,930 teachers of all levels, and 235 teaching establishments were involved in the development of contents for the Blue School. The next steps involve spreading the concept of the Blue School along and across the Atlantic.

Over the past decade there was a bolstering of national and European financing instruments dedicated to scientific research and to the ocean economy

Conserving the marine biodiversity and ecosystems has also been a primary concern, and the classification of marine protected areas has been one of Portugal’s international commitments within the EU and the UN Convention on Biological Diversity. In 2020, Portugal had 93 marine protected areas, some with overlapping classifications, covering approximately 7% of the waters under Portuguese jurisdiction (304.195 km²).

This status quo greatly reflects the effects of the previous National Ocean Strategies and marks the baseline for the NOS 2021-2030. It also sets a benchmark for defining the Vision and the Strategic Goals that we will present and expand on in the chapters 3 and 4.



3. VISION

The ocean has been, and still is, one of Portugal's key characteristics. A healthy ocean is essential for the Portuguese society to strive and to benefit from a sustainable, circular, and inclusive blue economy. In a decade marked by looming global threats, such as climate change, loss of biodiversity and integrity of the ecosystem, new forms of pollution, and the acidification of the oceans, Portugal is called upon to play an active role in searching for global solutions. In order to play this role, Portugal must lead by example.

The ocean has tremendous potential to promote advancement in scientific knowledge. Scientific research allows us to identify ways to protect vulnerable species and the ecosystem, to safeguard the cultural heritage, and to optimize economic activities, working as a driver for innovation, economic development, and job creation. Ocean security is essential for responding to threats, by pre-empting and acting in situations where the marine environment, as well as the economic activities and human lives depending on the ocean are placed in jeopardy.

Therefore, this strategy's vision is based on promoting healthy oceans in order to maximize sustainable blue development and the well-being of Portuguese people, setting Portugal as a leader in science-based ocean governance.

4. STRATEGIC GOALS FOR THE DECADE

Portugal, as the rest of the world, is facing major global challenges that will persist over the next decade. Climate change, natural resources overexploitation and the decline of biodiversity, famine and thirst, threats to human and ecosystem health, and the loss of cultural heritage and its associated knowledge are consequences of human action we must reverse over the next decade. To present the best possible actions to face all these challenges, the NOS is organized around ten major Strategic Goals (SG) for 2021-2030. These goals were defined from the state of the art presented in chapter 2 and by applying a strengths, weaknesses, opportunities, and threats (SWOT – summarized in Table 1) analysis, making sure such SG are aligned with the goals of the UN 2030 Agenda and with those of the European Green Deal. The SG selected are national objectives where the blue economy may make a difference or where our relationship with the ocean needs to be further developed and stimulated.

Table 1
**Summary of SWOT analysis for the NOS
 2021–2030 Strategic Goals**

 Strengths	Threats 
<ul style="list-style-type: none"> • Size and diversity of the Portuguese ocean • Good environmental status • Specialised scientific and technological know-how • Portuguese language and diaspora • Ports and infrastructures • Diversity of natural resources and renewable power sources • Ability to attract and retain foreign talent • National Ocean Strategy • Marine natural and cultural heritage 	<ul style="list-style-type: none"> • Climate change and natural disasters • Ocean pollution and acidification • Illegal fishing, biopiracy, and other threats to biodiversity • Piracy and other maritime unlawful acts • Illegal immigration networks • Geopolitical confrontation • Economic recession • Pandemics • Destruction of cultural heritage • Threats to the security of remote management and information exchange processes
<ul style="list-style-type: none"> • Geostrategic position in the EU and Atlantic Ocean • Access to available international financing instruments • Extension of the continental shelf • Export of power from renewable sources and new marine fuels • Export of fishing and aquaculture products • Integration into international logistic chains • International cooperation and framing into policies with a global scope • Increase in number and tonnage of ships with Portuguese flag • Increase in the capacity for moving goods 	<ul style="list-style-type: none"> • Vulnerability to the effects of climate change • Weak industrial capacity • Lack of diversity in ocean economy • Lack of qualified workers in some areas • Weak entrepreneurial culture • Difficulty in accessing private financing • Insufficient means to ensure the protection of natural resources • Invisibility of archaeological and immaterial cultural heritage
 Opportunities	Weaknesses 



SG1 - Fight Climate Change and Pollution and Protect and Restore Ecosystems

Due to its extensive coastline and biogeographic position, Portugal must face the challenges of climate change, environmental protection, and conservation of biodiversity as key factors for its future as a nation.

This strategic option means choosing to cooperate in the acquisition, development, and consolidation of scientific knowledge, especially in the development and implementation of technological solutions in the several sectors of the economy that allow reducing the effects of environmental threats while improving monitoring and surveillance capabilities. Whenever appropriate, innovations developed in this context should be protected by intellectual property rights. Although the main focus should be on the prevention of the impacts on the ecosystem, it is just as essential to develop regenerative solutions that allow recovering the health of the marine ecosystem, sequester carbon, and reconvert it into the food chain. It is also important to strengthen prevention and safeguard measures for people and goods against coastal risks. We also should incentivize high-tech pollution-fighting solutions, regardless of the source of pollution (plastics, hydrocarbons or other hazardous substances, including draining urban sewage). In addition to developing technical solutions for ecosystem restoration, it is essential to reduce marine debris, either generated by marine activities or on land. With this in mind, the measures we have been implementing towards reducing package waste, by promoting reusable packages, increasing the efficiency of recycling systems, avoiding single-use products, and reducing material waste should be reinforced over the next decade.

However, we must first identify the most threatened ecosystems, habitats, and marine species and focus the scientific research on the protection and recovery of these species and ecosystems. Part of this effort will involve finding best practices in the use of the marine realm and classifying marine and coastal areas.

Regarding the air pollution caused by maritime transport, Portugal must consider including the continental and insular coastal areas within its EEZ into a newly established area of sulphur and nitrogen emission control in the Northeast Atlantic, thereby connecting the existing areas in the Baltic Sea, North Sea, and the English Channel to the Mediterranean.

These challenges become urgent considering the risk of degradation of the ecosystems and collapse of species, amplified by the increasing anthropic pressure (population growth and increase in consumption) and climate change, whose effects have only become starker in recent years.

Considering that the ocean has no borders, that part of its biological resources are not sedentary, and that the challenges they face exist on a global scale, Portugal should be one of the countries leading the fight on climate change, protecting and restoring the environment, and conservating marine biodiversity, trying to mobilize the international community in seeking global solutions.



SG2 - Foster Employment and a Circular and Sustainable Blue Economy

The blue economy is now a relevant part of global economy. It includes all sectors with a direct or indirect link to the ocean as a source, means, or target of business and its development. In the EU Blue Economy Report published in 2020 but based on data from 2018, the turnover generated by ocean-associated activities reached 2,040 billion euros. Emerging sectors such as blue biotech, ocean renewable energies, seaweed aquaculture, or digital technologies contributed approximately 1,290 billion euros. The GVA of the established sectors was 218 billion euros in 2018, with a total turnover of approximately 750 billion euros and 2.2% of all jobs in the EU, employing 5 million people.

According to the OECD projections for 2030, the blue economy will grow more than the global economy, both in terms of GVA and employment. That is why developing a blue economy is one of Portugal's major goals for this decade, especially focusing on the sectors mentioned above. However, this goal depends on SG1. The development of the blue economy must be founded on healthy ecosystems and on the protection of coastal communities by using the principles of circularity, inclusiveness, equality, and sustainability. Only in a scenario of environmental, social, cultural, and economic harmony can the economy truly prosper. Therefore, and in keeping with the Circular Economy Action Plan, it is important to develop a biology-based circular economy, where the principles of reducing, replacing, reusing, recycling, and reclaiming primary resources is the new normal, with consumers playing a key role as the drivers of fair

and responsible trade practices. The economy must also be inclusive and able to generate qualified jobs to meet the needs of the market, keep jobs in the primary sector, particularly in fishing, promote the development of maritime routes and port structures geared towards smaller environmental impact, and ensure the cultural and social sustainability of coastal communities. Efforts should be undertaken to increase the attractiveness of becoming a professional fisher for younger people. This approach must go hand in hand with the need to improve health and safety conditions on board and on landing ports. Coastal communities also have a role to play in developing a biological-based circular economy by reusing marine resources. It is also key to ensure a better balance along the value chain by promoting the endogenous resources of coastal communities, based on a sustainable integration of the industrial ecosystem. This will stimulate value creation and the development of local economies that are traditionally more dependent on the ocean, whether directly or indirectly by association with other activities, such as tourism or fish processing.

Other efforts will be developed to diversify port activities, facilitate access to the ocean, attract new companies to stimulate local economies, and promote the transfer of knowledge and technology to innovative and traditional activities. Finally, in the scope of integrated management, there must be an articulation between port dredging activities as part of maintaining port accessibility and coastal protection actions, in order to increase territorial resilience.



SG3 Decarbonise the Economy and Promote Renewable Energies and Energy Autonomy

By ratifying the Paris Agreement, Portugal committed to becoming carbon neutral by 2050. The Roadmap to Carbon Neutrality 2050 (RCN 2050) sets as decarbonisation targets the reduction of emissions by at least 85% by 2050 in relation to carbon emissions in 2005, and a carbon sequestration capacity of 13 million tonnes. It is also essential that, over the next decade, we focus more on reducing the emissions of greenhouse gases. To that end, the National Plan for Energy and Climate 2030 - PNEC 2030, which implements RCN 2050 for 2021-2030, defines targets for emission reduction, incorporation of renewable energies, and energy efficiency.

The ocean can make a decisive contribution towards decarbonisation in three areas closely related to the Sustainable Development Goals

(SDG) of the UN 2030 Agenda. These include SDG 7 – Ensure access to affordable, reliable, sustainable, and modern energy for all; SDG 9 – Build resilient infrastructures, promote sustainable industrialization, and foster innovation; and SDG 14 – Conserve and sustainably use the oceans, seas, and marine resources for sustainable development. As for SDG 14, blue carbon is especially relevant. In Portugal it can be found in ecosystems like marshlands, marine prairies, and on coastal and oceanic areas and their living and non-living resources, and whose carbon sink capacity can be improved by fostering marine reforestation, seaweed aquaculture, or integrated multi-trophic aquaculture. SDG 9 implies the reduction of carbon dioxide emissions, which should lead all sectors of the ocean economy to invest in energy efficiency and to incorporate innovative technology and new materials and processes with low carbon footprints, protecting the associated industrial propriety rights. This is especially geared towards the transportation of goods and people, which produces greenhouse gases, to ensure the energy transition to green shipping in the medium and long term by adopting alternative energy sources with low or zero carbon emissions (liquified natural gas, hydrogen, and synthetic fuels) and electrical power, namely by using solar power. The sectors of recreational boating, tourism, fishing, and aquaculture in Portugal must join in on this effort of energy transition and in developing new processes to ensure the goals of carbon neutrality are met.

Under SDG 7 – Accessible Renewable Energies, investing in Renewable Ocean Energy will enable the diversification of local and renewable power sources, reducing the dependence on fossil fuels and thus greenhouse gases emissions. Portugal has the strategic added value of increasing its energetic autonomy on both mainland and Autonomous Regions. The latter face unique challenges in energy supply. However, it is essential to ensure the assessment of the impact of using ocean energy sources and their associated infrastructures on the marine fauna and flora, as well as on the cultural heritage and ocean-related economic activities. Fulfilling the ocean's potential for decarbonisation implies properly enforcing the legal framework of the Maritime Spatial Planning (Status Plan of the Maritime Space and Allocation Plans) and that tax and investment policies include positive and negative incentives for this new model of decarbonisation in the ocean economy.



SG4 – Invest in Guaranteeing Sustainability and Food Security

Portugal has one of the highest fish consumption *per capita* but about 75% of the ocean-based products consumed in the country are imported. The ability to feed ourselves in a sustainable and sustained way, aligned with the European initiative “From Farm to Fork”, hinges on the sustainable exploitation of living marine resources, on the growth of national aquaculture, including multi-trophic and offshore production, and on alternative forms of protein production, such as biotechnology and lab-based cellular differentiation of new marine cell lines, 3D printing, and the search for new and easy to produce marine protein sources. The fish processing industry must foster the concept of zero waste production and the full use of waste, co- and sub-products, ensuring that processing does not prevent traceability and therefore food security.

It is important to promote the use of molecular tools to fight the illicit replacement of high-value marine species by with others of lower value, and to develop and apply technologies that allow for the monitoring of emerging pollutants, micro-plastics, and nano-plastics in marine products meant for human consumption. Developing land and sea monitoring is part of the assurance of sustainability and safety in the fisheries chain. Food sustainability must include not just domestic fish production, from both fishing and aquaculture, but also the consumption of imported fish, identifying its origin, considering the environmental impact of its production and transportation, and conducting a risk assessment for new climate change-related risks (like new toxic organisms and new toxins). These may determine the need to change current laws to detect them and impose new demands in the framework of food security.

By 2030, Portuguese fishing should be one of the most sustainable and low-impact sectors on a global scale, stimulating the use of public funds to promote this transformation. Part of the challenge is to maintain sustainability based on scientific knowledge, technological innovation, diversification of exploited resources, and to focus on quality market niches, applying a corporate rationale to fisheries-related research.

The importance of fish products (including both fishing and aquaculture products) in the national diet is well known in terms of protein quantity, diversity, and quality as well as considering Portuguese gastronomy, culture, and history. However, the high cost of importing

fish, which causes an imbalance in our trade of fishing products, is the main reason for considering the autonomy and security of the food chain supply (identifying the origin, quality, and sustainability of imported products) as strategic vectors of the ocean economy. The guidelines of the National Programme for the Promotion of Healthy Food aim towards increasing the consumption of locally-sourced species and promoting literacy in this area, namely for schoolchildren. The Innovation Agenda for Agriculture 2030 has the target “Improved Health – increase the adoption of the Mediterranean Diet by 20%”, where the consumption of fish takes centre stage.



SG5 – Facilitate Water Access & Supply

The growing use of water for public supply, agricultural and animal production, recreational uses, and industry, among others, has exerted an enormous pressure on global water resources. In certain world regions, such as that where Portugal is included, this pressure will be further increased under any of the predicted scenarios of climate change. Increased number of prolonged droughts and increasing risks of saltwater intrusion in the freshwater reservoirs of coastal areas are expected, as these phenomena and their environmental and economic impacts have drastically increased in frequency and intensity in recent years.

It is therefore crucial to have access to alternative water sources and to increase the efficiency of their usage. One of these sources are the desalination systems, which tend to be carbon neutral when associated with the production of renewable ocean energy; however, its environmental impacts must be assessed and minimized. Hence, it is fundamental to include desalination in the management framework of water resources comprised in the NOS 2021-2030, complementing the National Programme for the Efficient Use of Water and the legal status of water production for reuse by treating wastewater. As stated in the National Plan for Water, the management of water resources is multisectoral in nature and may require the mobilization of the economic sector and ocean-related sector, without forgetting non-conventional systems for the collection and transport of water.

This inclusion of desalination in the scope of NOS 2021-2030 is particularly meaningful given the relevant knowledge on sanitation engineering in the country and its investment in differentiating industries such as electromechanics, electronics, and textile. Centres

of excellence support industrial innovation and the capabilities for a multisectoral approach to desalination, allowing us to contribute towards the goals of the UN2030 Agenda, namely regarding the access to water, clean and accessible energy, and industry development and innovation in the framework of sustainable development.



SG6 - Promote Health and Wellbeing

The health of the ocean is, in various ways, directly linked to the health and wellbeing of humans. The marine ecosystem services that provide oxygen and sequester carbon dioxide may be one of the most relevant but overlooked connections between the ocean and human existence. As for food, the regular consumption of fish and other seafood is part of a healthy diet and it has known positive effects on human health, as marked in the Integrated Strategy for the Promotion of Healthy Food.

The ocean is also a source of bioactive substances that can be produced by blue biotech from a plethora of marine organisms (bacteria, algae, sponges, corals, molluscs, and other invertebrates). However, developing such substances depends on knowledge and it is therefore essential to invest in technology and research applied to this area. This is an especially promising sector and we expect new pharmaceutical and nutraceutical products important for human health and quality of life to be developed (for fighting oncological disease, infections by antibiotic-resistant strains, pain, asthma, and inflammation, for example), along with others to be applied in aesthetics (cosmeceuticals) and general well-being (thalassotherapy and algotherapy, among others).

Finally, marine and coastal ecosystems offer opportunities for various recreational activities. All these experiences offer several benefits, including aesthetical satisfaction, the improvement of physical and mental health, and an added feeling of well-being. These natural and cultural services are seen as tools to improve environmental quality and life quality, while contributing towards the sustainability and resilience of communities and territories.



SG7 - Stimulate Scientific Knowledge, Technological Development and Blue Innovation

Scientific knowledge must be at the service of people, foremost as a support tool for political decisions. Universities, research centres, and State Laboratories are, by their nature, privileged sites to promote scientific knowledge and research, and its connection to society must be further stimulated. The production of knowledge as support for public policies must be a priority and it is in constant need of multi-disciplinary and collaborative approaches. The same applies to the development and transfer of scientific knowledge to companies, where collaborative labs (CoLabs) play a crucial role on the implementation of R&D agendas geared towards providing economic value and qualified jobs.

Attracting citizens' participation in the development of ocean sciences is important. Special attention should be paid to the knowledge of local ecology and culture, as this can be a source of information and commitment to the continuous observation of natural systems, cultural heritage, and interaction between man and nature. Another source of information to consider is the use of ships allocated to maritime transport and touristic operations, as well as fishing vessels, as an opportunity to increase the amount of data collected and the area they span. It is, therefore, necessary to study mechanisms that stimulate the capture and disclosure of data by such ships.

Continuous observation based on collecting ocean data, both *in situ* and *ex situ*, and from the traditional physical-chemical data to biogeochemical data, is crucial for understanding the dynamic processes of the marine environment. It is essential to provide sustained support for ocean observation systems and to promote their digitalization, interoperability, recording, and accessibility, with secure and user-friendly digital applications, as well as artificial intelligence-related technologies.

Ocean sciences are also raw material for innovation and, as such, it is important to retain and attract talent and investment to Portugal in all areas of the blue economy. This is achieved by establishing multi-disciplinary clusters, developing a culture of intellectual property and granting access to world-class infrastructures. We can promote competence building in scientists, technicians, engineers, and managers by setting up lively environments with a strong potential for interaction and innovation. To this end, we must ensure the complementarity of profiles and the participation of the economic

sector, academia, and public actors in a symbiotic way, materializing initiatives that promote virtuous arenas for development, experimentation and operation. Similarly, we must maximize the quality of Portuguese science internationally by actively cooperating with international institutions.

Portugal is an attractive country for conducting tests and trials of ocean-related technologies. Making the best use of the specific conditions of the Azores and Madeira archipelagos, it is possible to develop infrastructure abilities of Atlantic dimension, in articulation with the national network of scientific infrastructure and with the priorities set for the economic sector. This potential should be used to its fullest. It is also important to mention that the Foundation for Science and Technology keeps a National Roadmap of Investigation Infrastructures with Strategic Interest that comprises multiple ocean-related infrastructures and is updated regularly.

The development of innovative approaches to ocean monitoring, including that of extreme environments, critical ecosystems, nautical and underwater cultural heritage, and of physical, chemical, geological, and biological processes, must be founded on the development of new sensors, platforms, and observation networks (autonomous and non-autonomous), benefitting from synergies with offshore systems of energy production, robotics, and aquaculture. Under the scope of the Atlantic Strategy, the space under Portuguese jurisdiction demands immediate attention regarding the soil and subsoil of the continental shelf, its epi- and mesopelagic zones in the water column, and the interactions between all these sections. Knowledge on the geologic, biologic, genetic, and heritage resources of our continental shelf ecosystem is still too residual, and we should therefore bolster research efforts.

It is also urgent to integrate scientific knowledge from third parties in the national maritime space by including Portuguese scientists in foreign research vessels, or other means that ensure access to scientific results.

Finally, priority should be set for strategies of ocean use that promote the protection and recovery of marine ecosystems with high ecological and cultural value, the sustainability of the system as a whole, and the increase of its resilience to man-made changes.



SG8 - Improve Education, Qualification, Culture and Ocean Literacy

Over the next decade, Portugal should increase the amount and quality of educational and training offer in all ocean-related areas. We must stimulate mobility between maritime professions, innovation and entrepreneurship. New professional skills within the scope of the EC's European Skills Agenda, with the purpose of attracting more young people and women to ocean-related professions, should be developed. To this end we must increase the investment in education and training of senior specialists in ocean-related subjects and in specialized training for internationally competitive specialists in ocean economy.

R&D is key for developing and patenting new technology but also to enable the development of multiple activities and the country itself, by promoting the sustainable use of the ocean and its vast resources. When conceiving and designing new skills, we must consider the corresponding benchmarks, training, and skill-assessment tools in the Recognition, Validation, and Accreditation of Professional Skills by interlinking the schools, professional training centres, qualification centres, universities, and institutes that provide the labour skills and the companies that benefits from them for improving the economy and the society. Updating and improving the supply of skills related to ocean activities, both for young people and adults, must start with the updating of the National Skills Catalogue. To this end, we established the Sectoral Council for the Qualification of Ocean Economy, where the main participants are represented.

In the SDGs of the UN 2030 Agenda, culture is synonymous with tolerance, accountability, and diversity, which are key concepts for Sustainable Development. It is, therefore, essential to implement policies that foster our culture, affirming our identity. It is impossible to quantify how much the production, development, and promotion of knowledge and culture can add to the wellbeing of communities beyond international projection, economic return, and job creation. We must develop strategies to value the cultural heritage that will contribute towards future education, science, land management, environmental, and tourism policies. There is also the need to bolster training, innovation, and international cooperation in culture, as well as to acknowledge maritime cultural heritage as a vector for the international promotion of our country.

During this decade we will invest in ocean literacy, involving the people instead of delivering it to the people, changing the way we think and act on matters concerning the ocean. More than communicating to society only the relevant aspects about the ocean, we need to include society itself in this transformation, especially children and young people, the future active citizens in Portugal and in the Portuguese-speaking community, namely by outreaching to Portuguese schools abroad.

We must establish a network of sites for displaying how important the ocean is for our identity, incentivize all citizens and sectors of society to adopt informed and conscientious attitudes towards the ocean, and teach how to communicate, act, and decide on ocean issues, in an inclusive manner, without disregarding the diversity of people's opinions. Many initiatives in ocean literacy are currently set in motion, promoted by a broad range of institutions and directed at different target audiences. We must develop more mechanisms for sharing information, experiences, and best practices to further promote these initiatives and establish as many synergies as possible.

To bring culture closer to the ocean, we must fuse scientific knowledge with the values and traditions that are part of the individual and collective lives of Portuguese people, so they can acknowledge the importance of the ocean in their lives and their own influence over the ocean. We must also increase people's participation and involvement in defining public policies. To reach this goal, we must include educators, researchers, communicators, professionals of ocean sectors, entrepreneurs, legal experts, politicians, artists, and young people, while also involving municipalities, associations, and companies linked to the ocean. Only then can the society claim ownership of a renewed maritime culture.



SG9 - Incentivize Reindustrialization and Productive Capacity and Ocean Digitalization

With the relocation of part of our production to other places, Portugal, and Europe in general, have been losing industrial-based productive capacity. Reindustrialization is essential, and ocean economy will play a key role in this process by adopting new principles and business models, calling on both traditional and emerging sectors, capturing more investment, and gaining traction as a strategic asset for internationalization.

National and regional smart specialization strategies highlight ocean economy as a very demanding and relevant field. We must continue to promote the establishment of clusters in both ocean economy and land management, namely in the areas close to commercial and fishing ports, in order to maximize R&D, the patenting of new investments, and easier access to the ocean. Portugal is recognized as having strong engineering capacity that can be applied to the industrial sectors linked to ocean economy. Portugal has an acknowledged background in naval engineering and in fish processing but also on emerging sectors of the blue economy such as blue biotech, oceanic engineering (with great progress in underwater robotics, sensors, communications, and information technologies with artificial intelligence), and space technologies (like the use of Earth's observation data, satellite navigation and communication). New forms of aquaculture, the value chain of renewable energies, and sectors linked to non-living marine resources may also represent huge opportunities for a new industrial and productive era in Portugal. The valorisation of these skills and proposals must be geared towards external markets in line with the goals of the Internationalize 2030 Programme.

Portugal is one of the EU Member States for which the ocean economy is most important within the domestic economy. Results show that ocean economy has been resilient, even through harsher periods, growing at a faster rate than the national economy. The value generated by companies linked to the ocean has increased consistently, as has the value of exports of the products of ocean economy. The reindustrialization of the country, based on ocean economy, will renew the maritime-ness of Portugal within a modern rationale, being inclusive, integrating R&D, following environmental criteria, based on excellent human capital, advocating circular economy and the efficient use of resources.

Also, reindustrialization must serve strategic concerns whose importance was demonstrated with the global disruptions in some critical sectors of the ocean economy caused by the COVID-19 pandemic, namely international maritime traffic.

Retaining or gaining new skills and knowledge, as well as gaining productive capacity of key resources, such as the production of containers or resources to support the handling of maritime freight, as well as technological innovation programmes directed to his area and aligned with environmental sustainability concerns, are a relevant priority in completing the vertical integration of oceanic industry in Portugal.

In this digital era, the dematerialization of procedures regarding ocean activities contributes to their advancement, as it simplifies and accelerates the associated administrative procedures. Examples thereof are the Logistics Single Window and Ocean Electronic Desk, whose coverage we must increase. The digitalization of ocean-related activities will help keep and attract people and the industry to marine traditional and emerging activities, maintaining good practices and national guidance in the field of cybersecurity. Digitizing and making freely available the data collected from the ocean floor and water column in the national open database of the public administration will allow society to inspect economic productivity and innovation as well as ocean literacy in the interest of health and wellbeing. Additionally, the use of competitive intelligence tools will act as new analysis tools for markets, new products, and services in ocean economy.



SG10 – Ensure Safety, Sovereignty, Cooperation and Governance

The unique relationship between Portugal and the Atlantic is a key factor for enhancing the country value, consolidate and strengthen cooperation relationships with other states, ensure sovereignty over its maritime region, and participate in joint processes aiming to ensure security over all areas of national and international interest. Considering its Atlantic and European dimensions, Portugal should promote the implementation of an Integrated Marine Policy in all its aspects. In the same context, Portugal must reinforce its claim as a globally-acknowledged maritime nation, reaping the rewards of its credibility and ability to bring people and countries together on a pluricontinental scale.

The NOS 2021-2030 is a tool for the country's sovereignty. It will require investment in innovation and science, geared towards increasing the remote mobile monitoring capacity of the ocean and coastal areas, and the development of smart tech tools and monitoring platforms. This will help build up the idea that knowledge is the steppingstone to exercise ocean sovereignty.

Multisectoral and transnational security partnerships, based on technical and operational cooperation to solve maritime and port issues, strengthen security and protection. Such partnerships are also fundamental tools favouring synergies and joint responses in the framework of prevention and suppression of illicit acts in the

management of humanitarian crises, search and rescue operations, and exchange of information, simplifying procedures and ocean monitoring and surveillance. To that end we must promote information sharing on marine awareness, with a growing involvement of the various interested agents, such as national, regional, and local administrations, companies and other players (fishing, science, environment, ports, transport, recreational boating, tourism, energy, among others), and competent authorities.

The external borders of the EU are 44,752 km long, of which 32,719 km are maritime borders. Portugal, with 21 maritime border posts is one of the countries with highest expression and relevance in the intersection of intercontinental routes, contributing to the appreciation of the ocean in its geopolitical and geostrategic relevance in the Atlantic and connected maritime areas.

NOS 2021-2030 must be a guiding tool for ocean diplomacy by fostering a strengthening of relationships with other maritime nations. Considering that the countries in the Community of Portuguese Speaking Countries (CPLP) also share a special bond with the ocean, this strategy must contribute towards a deeper cooperation in ocean affairs by materializing the CPLP Ocean Strategy. It must also contribute to the continued international cooperation in the Atlantic Basin, under the umbrella of the Atlantic International Research Centre (AIR Centre) and the Belém Declaration, which promotes que cooperation in research and innovation in the Atlantic Ocean, as signed in Lisbon in 2017 by the EU, Brazil and South Africa, with Portugal playing a very active role.

Furthermore, within the framework of Portugal's international obligations, NOS 2021-2030 reflects the UN Convention on the Law of the Sea (UNCLOS) that introduced the current regime of ocean governance. UNCLOS is an essential instrument of international legal order, and Portugal has been accompanying its evolution since the very beginning. Portugal is present in several processes within the UN, such as the Agreement on the Implementation of the UN Convention on the Law of the Sea, related to the Conservation and Sustainable Use of Marine Biodiversity in Areas beyond National Jurisdiction, where Portugal has played a pivotal role in international forums.

Until 2030, Portugal may conclude the extension of its continental shelf presented to the UN, which is crucial in ensuring SG10. This added responsibility in the Atlantic warrants closer monitoring by several

international forums, such as the International Seabed Authority, that decides on the signing of agreements but also regulates activities.

The NOS 2021-2030 further strengthens the role of Portugal as a flagship state, port state, and coastal state under the International Maritime Organization (IMO), and as an actor in the fight against ocean pollution, in the framework of the Lisbon Agreement and other similar regional agreements in connection with the European Agency for Maritime Safety, based in Lisbon, and in the protection of Underwater Cultural Heritage under the 2001 UNESCO Convention.

NOS 2021-2030 also reinforces the country's efforts in EU initiatives in fighting criminal activities like piracy, illegal immigration, or asymmetric threats. In joining the European Centre of Excellence for Countering Hybrid Threats (Hybrid CoE), we expect Portugal to increase its contribution to the promotion of resilience in facing hybrid threats, namely those related to maritime security. Criminal networks exploiting migratory movements in the ocean must be the focus of redoubled attention, ensuring proper linkage of competent services in the areas of national defence, internal affairs, and migrations. Considering the need to look at migrations from a humanitarian standpoint, we must follow the National Implementation Plan for the Global Pact on Migrations as a national response to migrations concerted with key international partners.

There is also the need to guarantee that Portugal is capable of ensuring its sovereignty over existing resources of national interest, as a complement to European and international cooperation. Interdepartmental cooperation is essential in the ocean affairs for the efficiency and efficacy of international maritime policy and its coordination with international cooperation.



5. PRIORITY INTERVENTION AREAS

Having defined the ten Strategic Goals for the decade, we must now identify priority intervention areas to materialize them. The priority intervention areas (PIAs) represent sectors or sets of sectors and ocean-related areas for which we need to develop procedures, stimulus, and support to bolster them and help them contribute towards reaching the Strategic Goals.

PIA1 - Science and Innovation

Science and innovation have primordial relevance. Strategic governance decisions are worthless if left unsupported by science of excellence. Therefore, the development of blue economy and the safeguard and restoration of marine and coastal ecosystems, as well as underwater cultural heritage, hinge on building a solid knowledge base for the ocean, including the ocean bed, and ensuing technological innovation. The same goes for the forecasting, prevention, and mitigation of the impact of natural or anthropogenic hazards. These tasks make it essential for the national scientific institutions to show commitment and cooperation, as well as participate in European and international research infrastructures, thus promoting the leadership of Portuguese scientific research in key areas of oceanic research. This is also a necessary step for the development of clusters for ocean knowledge, based on the cooperation of scientific institutions, companies, and other public and private entities, not constrained by national borders. As an example, we would like to highlight the roles that the AIR Centre, CoLabs, and the upcoming Atlantic Observatory can have in developing such scientific cooperation.

Promoting an open data policy is another key aspect in this AI to ensure transparency and facilitate access to data collected by all ocean users, of which the national civil service portal of open data and EMODNET (European Marine Observation and Data Network) are examples. This approach is an important tool to reach goals as varied as the growing involvement of citizens in science or the implementation of international agreements like the Nagoya Protocol.

Just as necessary is the development and maintenance of plentiful and high-quality laboratory or field infrastructures on a European scale, to support leadership in key scientific areas. We need national infrastructures set up in the ocean (inshore and offshore) for trials and scale-up in a natural environment, benefitting from synergies with pre-existing infrastructures, particularly those related to the production of renewable energies, underwater connections, and offshore aquaculture. Portugal must also take part in international initiatives in the field of oceanography and climate like the Argo Programme, and in collating and processing ocean information and data, investing in the equipment and infrastructure necessary to observe and monitor Portuguese waters.

It is also urgent to integrate scientific knowledge gleaned by third parties in the national maritime space, by including Portuguese scientists on board foreign scientific cruise ships, allowing them access to the data and results of that research, thus generating benefits on behalf of Portuguese scientific knowledge.

It is imperative to transform knowledge into wealth and employment. We must increase the transfer of science and technology to corporate innovation in strategic sectors, based on the real needs of the economy. To that end, we must foster co-promotion projects, mobilizing projects, and investment projects aiming a quicker development and patenting of new goods and services. Alongside this, we must implement national roadmaps and programmes for the several areas of the ocean, such as the National Bioblue Economy Roadmap, where the main challenges, as well as solutions, in science, technology, and innovation devoted to the ocean are identified.

Finally, we must stimulate international cooperation in ocean sciences, pursuant to the UN Convention on the Law of the Sea and goals set for the UN Decade of Ocean Sciences for Sustainable Development 2021-2030, where Portugal must take on a key driving role. In the Atlantic zone, cooperation on Research & Innovation (R&I) must be further promoted by Portugal, namely in the scope of the Belém Declaration and the AIR Centre.

PIA2 - Education, Qualification, Culture and Ocean Literacy

In order to develop maritime culture and blue, circular and sustainable economy, education and training are fundamental. This approach

must be inclusive and transversal to all areas, and its implementation must be mindful of the social and territorial realities. It must begin in the first year of school, starting with the knowledge laid down in Essential Learning regarding this topic and developed over the period of mandatory education.

Education for Citizenship and Development is also a privileged teaching space for the development of transversal and interdisciplinary learning. Especially relevant is the ongoing interaction of School Sports with curriculum development, namely through the Sports Training Centres of Nautical Activities in School Sports, located both in coastal and inland waters. This is a large investment towards promoting the contact of children with water sports (Canoeing, Surf, Sailing, and Rowing) and a structured effort to bring children and young people closer to the sea, allowing them to gain skills linked with ocean literacy, under the umbrella of Curricular Autonomy and Environmental Development and Sustainability.

The Blue School Programme of the Ministry of the Sea has been building up a teaching community more aware of the ocean-linked challenges. The next step, once this community is established, is to consolidate the Blue School Programme and strengthen cooperation between the various sectors linked to the ocean, education, culture, and municipalities. This programme has achieved international recognition and its expansion toward the entire country, as well as setting up an international network of Blue Schools, is a natural evolutionary step. As this is not only a Portuguese issue but a global issue, we must support ocean literacy on an international level, especially in Portuguese-speaking countries and Portuguese schools abroad. Developing skills in civil servants is also an important subject, especially leveraged through the promotion and cooperation with the international institutions that Portugal is a part of.

The active population must be allowed to contribute and to be trained in a variety of ocean professions, whether through higher education or offers of double certification education and training (for young adults), leading to a body of informed players in both public and private sectors and promoting local jobs and their flexibility and mobility. To this end, we must identify, analyse, and assess the current and future needs of the labour market. Courses of all levels must be attractive and include in-person and distance learning, and both practical and theoretical aspects, with international certification and employability. The goal of this strategy is to fight unemployment and promote the balanced economic development of all of Portugal's

regions. The courses should favour the bond between schools and companies, providing a solid response to the training needs of human resources, and be more flexible to respond to the specific regional needs and sectoral certification in thematic areas that are a priority for the economy.

Considering the strategic importance the ocean has to Portugal, with all its economic, scientific, social, cultural, and environmental implications, it is imperative to draft an integrated strategy to develop ocean literacy that includes and reaches various sectors and the whole of society. The implementation plan for ocean literacy must define goals, indicators, and targets, and be supported by adequate financing mechanisms. It must be framed into the SDGs, responding to the priority goals of the NOS 2021-2030 in a direct, integrated, and cohesive manner. It is also relevant to ensure that the Portuguese strategy for ocean literacy is aligned with other national and European strategic tools, like the National Reading Plan, the National Plan for the Arts, and the EC Atlantic Action Plan 2.0. We must highlight the need to integrate the various initiatives related to maritime culture, and to promote coastal material and immaterial cultural heritage, produced in Portugal, of interest to several sectors of society.

The vision adopted in this decade will be more inclusive and holistic, pursuant to the Intergovernmental Oceanographic Commission of UNESCO (IOC-UNESCO) proposals for instance, and adjusted to the different realities and perspectives. It is important to highlight the certified upskilling and training of educational agents with a multiplier role (for both formal and non-formal education), and the inclusion of ocean-related topics into the curricula of various levels of teaching. We must also foster research into ocean literacy, bringing into this community researchers of social areas and education.

PIA3 - Biodiversity and Marine Protected Areas

In Portugal, the ocean represents huge diversity in terms of genetics, species, habitats, and marine ecosystems. Our ocean beds and pelagic systems are very heterogeneous and show physiographic and geomorphic diversity, meaning great geologic and biologic wealth.

However, beyond direct human impact, these marine ecosystems suffer from the effects of climate change, inducing ocean warming

and acidification, hypoxia, and changes in biologic productivity and its distribution.

Portugal has consolidated experience in the knowledge and conservation of marine biodiversity, including the establishment and management of marine protected areas, and it is a pioneer in the designation of oceanic protected areas. To this end, Portugal has made the political commitment to classify approximately 30% of the maritime area under Portuguese jurisdiction by 2030, including 10% of the maritime area under strict protection, in line with the goal set by the EU's Biodiversity Strategy for European marine waters. Additionally, in 2018, Portugal approved the National Strategy for the Conservation of Nature and Biodiversity 2030, where the importance of marine protected areas is reasserted; in 2019, the strategic guidelines and recommendations for the implementation of a National Network of Marine Protected Areas were also approved. It is crucial that over the next decade these strategies are applied, thus making a decisive contribution towards preserving the natural marine heritage, safeguarding the structure, functioning, and resilience of marine and coastal ecosystems. More specifically, as well as defining new marine protected areas, it is essential to draft and implement management plans for existing protected areas, to increase the efficacy of these biodiversity protection tools. Also, Portugal is committed to the Decade on Ecosystem Restoration Agenda.

To improve the conservation of marine biodiversity, it is necessary to foster tight research networks and to develop the scientific and technical knowledge needed to define new areas to classify, but also to identify, experiment, and assess the efficacy of management measures and restoration of biodiversity. It will be equally necessary to involve coastal communities, economic agents, especially those in the fishing sector, and coastal action groups through participatory and co-ownership mechanisms in the conservation of natural resources and biodiversity.

The conservation of marine biodiversity is one of the environmental pillars of ocean policy, but its importance in the economic side should also be noticed. Biodiversity is the target of relevant economic activities, like fishing and touristic activities, and coastal and marine ecosystems provide a number of services essential to society, including climate regulation, primary production, or the creation of genetic resources, which must be valued and accounted for.

PIA4 - Bioeconomy and Blue Biotech

One of the main goals of bioeconomy is replacing fossil resources with renewable, biologic-based ones (raw materials, subproducts, or waste) showing a better performance profile and lower environmental impact. Bioblue economy is arguably one of the most promising emerging sectors in blue economy. It includes the biotechnical use of all groups of living, non-traditional marine resources, of all commercial applications from its biomass, and the flows of waste and subproducts their processing may generate. This group of marine organisms includes macroalgae, microorganisms (microalgae, bacteria, and fungi) and invertebrates (echinoderms, sponges, corals, and molluscs).

Although these biological marine resources have had more traditional uses in the past, such as food for humans or animals and biofertilizers (seaweed), new commercial applications are currently increasing. These applications include the development of high-tech goods and services in several markets, including pharmaceutical, medical, veterinarian, nutraceutical, functional and sports foods, haute cuisine, cosmetics and well-being, biofuels, fashion, bioremediation, and natural engineering, to be duly protected by intellectual property rights (IPR).

The concepts of sustainability and circularity must be inherent to Blue Biotech. The multiple applications of this technology allow us to develop the concepts of integral valorisation of bioresources based on biorefinery, striving for zero waste, generating value chains for

each single bioresource, and also enabling more agile and diversified business models for the entities that install and operate them.

In this decade, Portugal must intensify its investment in Blue Biotech and in developing a stronger and more expressive bioblue economy. It is important to strengthen the bridges between academia and industry, channel investment to innovation, and develop flexible partnerships devoted to seeking solutions to actual problems, stimulating the corporate field to hire researchers.

We must prioritize public support and financing to de-carbonising, circular, and sustainable projects. However, for this to happen, Portuguese Blue Biotech must increase in scale. It is essential to bolster the skills of potential entrepreneurs and the relevant complementary training for current and future marine scientists, as well as of the many current entrepreneurs who may have to rethink their business. Increasing the scale of investment and production, and the internationalization of companies in this sector, should be the target of public policies to support and finance this sector.

Ocean bioprospecting in national waters, especially in the deep sea, shall continue in order to increase the scientific knowledge of marine genetic resources with biotech potential in Portugal. However, the laws regulating the access to these resources and who can benefit from them must be clarified. We must ensure the Nagoya Protocol provisions and European and national laws on the sharing of the benefits of biodiversity are truly implemented in Portugal. More cooperation between academia and industry, including international cooperation, the implementation of a Digital Blue Hub to gather all data of national marine collections, access points and conditions, infrastructures for prototype production and upscaling, biorefineries, and marine biomass processing, and the CoLabs dedicated to ocean-related research, all have strategic importance to strengthen possible leadership and growth of Blue Biotech at the European and International levels.

PIA5 - Fisheries, Aquaculture, Processing and Commerce

The industry of fisheries and aquaculture, including processing and commerce, is a priority intervention area for several of the SG in the NOS 2021-2030. Some of the most urgent challenges to overcome are minimizing the impact on vulnerable species and marine ecosystems,



developing new products and processes, and establishing new business models based on circular and digital economy.

Fishing has an important role in the socioeconomic balance of several coastal communities and it develops synergies with other sectors like naval construction and repairs, fish marketing and processing, and tourism. Fishing must therefore be increasingly governed by the principles of the EU's Common Fisheries Policy (CFP), namely concerning the sustainability of resources. The positive evolution of the state of the resources caught in national waters are proof that the general policy has allowed adjusting the capacity of the fleet to the fishing opportunities, even if particular situations still require intervention of some kind.

We currently have an ageing fishing fleet, with shortages in terms of habitability, but it is important to note that part of the vessels have been modernized and are now equipped with modern technology. However, we must continue to invest in innovation, in improving working conditions on board, in security and energy efficiency, as well as in stowing fish so as to maintain its quality and value. Beyond quality, the sustainability of fishing resources should be a differentiation and valorisation factor for fishing products in the market, which is increasingly aware of the environmental component. We should also incentivize fish traceability, favouring the catches in Portuguese waters, resorting to technology like molecular identification tracing or blockchain, as well as to the use of surveillance and control on land and sea, thus preventing illegal, unreported, and unregulated (IUU) fishing and the fraudulent marketing of fish.

It is also important to elevate the profession and promote the upskilling of fishers and their representatives by investing in training, as well as in technical and professional certification, to include concepts of environmental sustainability. Training should focus on the reduction of waste and on increasing the value of catches, linked to the price/quantity relation. What we catch must be based on market needs, avoiding waste and discards or significant price reductions, with losses to the operators and representative bodies, who are deprived of their ability to intervene in the value chain. Training fishers should help bring younger people into the trade and facilitate mobility between professions associated with the ocean, establishing synergies with the tourism, transport, and aquaculture sectors.

Priority must also be given to the study of the impact that fishing has on the most vulnerable species and on marine and coastal

ecosystems, and to continue the so-called *green transition* of fishing, by abandoning more destructive practices and methods in favour of more sustainable ones and promoting the reduction of marine debris produced by fishing. In this context, the involvement of the producers' organisations (POs) in sustainable management of each fish stock must be encouraged, promoting the effective joint management of fishing with other interested parties. It is also relevant to promote short circuits for the marketing of fish, proximity, serving all centres of consumption, irrespective of their size, using fish conservation and processing technologies and the monitoring of their quality. To this end, we should stress the crucial role POs have in increasing fish value, including the use of packaging and processing techniques that allow fish products to re-enter the market later for human consumption.

Aquaculture keeps increasing in relevance in a context where national fish production is insufficient to meet the demand and catches of marine fish are limited, in a framework of sustainable management and exploitation of living marine resources. Domestic aquaculture is, therefore, a good alternative to traditional forms of supplying fish. Its already wide market and long tradition of mollusc, as well as freshwater and saltwater fish production, has recently begun using advanced and modern technology. In this context, we must promote the sustainable development of aquaculture in areas indicated in the National Status Plan for Maritime Spatial Planning and Plan for Aquaculture in Transition Waters, fostering high standards of environmental quality, both for the productive structures on open sea and production units in transition waters or onshore.

The development strategy must include the promotion of multi-trophic integrated aquaculture, so as to increase productive capacity and diversify production, shrinking the impacts on the marine realm. We must research new production methods and new species for human consumption and for other purposes. Additionally, we must foster the production of seaweed and other indigenous species of lower trophic levels, so as to reduce dependency on fishing, and to increase the development of locally-sourced aquaculture products from a value chain standpoint. This should be accompanied by investment in solutions that favour circular economy and the use of locally-sourced underexploited subproducts and resources, also supported by new concepts of packaging, labelling, and sustainable products. Investing in offshore aquaculture, already matured and ongoing in Madeira, is one of the lines of action to follow, by recognizing and capitalizing on the acquired knowledge and promoting spill-overs into other sectors, like tourism and other offshore activities. These are guidelines that

meet the intentions of the EC's "From Farm to Fork" Strategy, which aims at having a sustainable and secure food system.

Processing and marketing fishing and aquaculture products is something that increases their value, and their coproducts should be used and appreciated. The sector of processing and commerce of fishing and aquaculture products benefits from the high quality of national fish and from the know-how of processed products, and it is positioned to place some products in specialty segments, as well as to develop new products to respond to current demand, creating added value and investing in external markets. The scarcity of some raw-materials to supply the fish-processing industry, exacerbated by the shortage of some stocks, catch restrictions and, above all, increase in consumption on a global level, force the national industry to seek alternatives in aquaculture. Promotional campaigns that redirect consumers to eating species with lower commercial value and with potential for sustainable exploitation may also contribute to reducing external dependency on the supply of raw-material.

PIA6 - Robotics and Digital Technologies

During the last two decades, due to the initiative and excellence of a high number of national institutions and researchers and to partnerships established with international organisations, Portugal as defined itself as a trailblazer in marine robotic systems and their applications to a number of activities involving a tight symbiosis between ocean sciences and technologies. The scale, average depth, Atlantic weather and the high energy of the Portuguese ocean pose great challenges to the implementation of the strategic lines defined herein.

The challenge of having a sustained and sustainable presence in Portuguese marine areas can only be met by resorting to robotic systems and technologies articulated with other digital and physical means and immersive reality systems. This challenge can only be overcome with an approach focused on the national specificities, in articulation with developments in trials and operations, elevating engineering and science capabilities and national infrastructures so as to minimize the costs of projects and operations. In addition to playing a part in observing and charting, environmental monitoring, identifying and protecting nautical and underwater cultural heritage, monitoring Portugal's sovereignty over the ocean, and managing of Portugal's marine resources, robotics is a key tool in several other

sectors and activities. That is the case with shipbuilding, infrastructure inspection systems (offshore renewable energy, ports, and other underwater infrastructures, like underwater cables), the exploitation of biologic and non-living resources, fisheries and aquaculture, and the handling, processing, and tracing of their products.

Over the next decade major challenges will be set for the national scientific and technological community, which will act as catalysts for the development of robotics and digital technologies. These challenges will include charting the deep sea and surveying its resources, detecting, following, and registering the concentrations of pollutants in the water column (including micro and nanoplastics), and inspecting, monitoring, and repairing large underwater infrastructures, just to name three examples. Relevance in aquaculture and in the use of offshore renewable energies is also expected to increase.

It is therefore urgent to define strategic initiatives that incentivize the creation of multidisciplinary teams joining academia and industry that through joint work and operations at sea, will provide the innovative and effective means and methods to study and explore the ocean on the scale required by the phenomena in question. This definition will also be crucial to generating small-medium enterprises (SMEs) geared towards the development, patenting, and marketing of marine technology, clearly a wealth-creation factor at the national level. To this end, we must develop bespoke systems and low-cost systems that are easy to replicate and safe, to fill the skill gaps in operations made on the surface, in the water column, and in the deep sea.



The characteristics of the national maritime space, in terms of area and depth, point to the need of developing new technologies or adapt existing ones, such as those of vehicle systems for air operations, to system operating on the surface or in the water column for extended periods and in the deep sea. These systems will be developed having in mind their ease to launch and recover by other means, interoperability with other systems, and still coordinated operation with other equipment and systems. This will allow us to shift the paradigm in operating vehicles towards ocean-observation systems that can effectively coordinate underwater, surface, aerial, and special robotic vehicles (including small satellites) and other systems, including manned platforms. The interdisciplinarity of sciences and engineering with other areas like artificial intelligence, biochemistry, and physics are key to the success in this field.

Digital technologies and remote-control tools to support decision and information sharing, monitoring, and identification, are essential for the management of humanitarian crises and to help on the early detection of incidents and crimes at sea. We must specifically mention ocean remote observation technologies from space and their various uses. Digital technologies also strengthen simplification mechanisms and offer a vision of proximity and ensemble of the inherent conditions of maritime carriage, and we cannot separate them from the concepts of smart ports and smart borders. Examples of such mechanisms are the Ports' Single Window, the Logistics Single Window, and the European Maritime Single Window.

This gathering of know-how and technological abilities and clear strategic guidance to which priority development areas will enable significant progress in this field will have great impact on other areas, like the conservation of biodiversity, the safeguard of nautical and underwater cultural heritage, maritime security, renewable energies, fisheries, aquaculture and the exploitation of non-living resources, thus linking various interventions in priority areas.

PIA7 - Renewable Ocean Energy

In order to meet the national goals of the RCN 2050 over the next decade, we must see the gradual adoption of cost-effective technologies that will improve the potential to use the country's local renewable resources. This will enable Portugal to continue its energy transition, firstly in sectors and technologies with lower cost-efficiency

and later, progressively, in the more expensive sectors and technologies until the targets of emissions reduction are met (45-55% in 2030 and 85-90% in 2050, as compared to 2005). The targets and goals set for the national productive sector, regarding renewable ocean energy, establish approximately 370 MW on offshore winds and waves by 2030, pursuant to the PNEC 2030, and up to 1.3 GW on offshore winds by 2050, pursuant to RCN 2050. These targets stem from the level of maturity of offshore wind technology (floating mooring), especially adequate for the bathymetry of our oceanic platform, and from the establishment of model zones with support infrastructure, as well as from the Industrial Strategy for Renewable Ocean Energy. Only after long years of intense R&D, could Portugal finally produce energy from oceanic renewable sources for a commercial purpose. However, capital costs linked to the use of these renewable energies are still too high to be competitive in the short term. The fact that Portugal has one of the largest EEZs in Europe with unique traits does not, by itself, ensure the production of renewable ocean energy, but it offers a high-potential opportunity to research, innovate, and invest in this area. It is also important to mention the experience of Portuguese companies in manufacturing turbines, platforms, moorings, and cables as a result of the development of the onshore wind sector and participation in offshore international projects, which can be capitalized upon in the context of the ocean economy.

Portugal already has a model zone where projects can be developed in several stages, from demonstration of devices to their pre-marketing or market stage, duly articulated with the National Transport Network, *vis a vis* energy transport infrastructures (including underwater cables), assuring the connection between energy production and the public power grid. Portugal also has several patents on renewable ocean energy, great industrial know-how of the wind, an Atlas of Offshore Wind Potential, crucial to the planning of new offshore wind plants, and a scientific and technological system directed towards the ocean and renewable energies. The insular character of our Autonomous Regions also fosters investment in that area, coupled with the analysis of the technical and economic feasibility of laying an underwater cable between the islands, integrating a marine infrastructure for the production, storage, and distribution of power, akin to the land grids. It is crucial to coordinate positions in R&D, companies, academia, research centres, public organisations, and the finance sector to promote synergies with other sectors, like aquaculture, robotics, and marine monitoring and surveillance systems. State and public administration must be able to promote simplification processes for ocean users, both private citizens and companies.

We must structure the value chain towards a new exporting sector in production of metalworks, shipbuilding, maintenance and repair services, offshore installation and operations, consulting and surveys, and data science.

Portugal is a strategic country for conducting trials in several ocean sectors, with the capacity to attract direct foreign investment and try new solutions in the production and storage of renewable energy, such as green hydrogen. For this purpose, and also to minimize potential conflicts with other uses of the ocean, the Maritime Spatial Planning tools should foresee new model zones, with strategic environmental assessments and adequate infrastructures that are easy and quick to access and of low-cost.

PIA8 - Tourism, Recreational Boating and Sports

Portugal has privileged conditions for coastal and ocean tourism and for nautical, recreational, and sporting activities. Not only do we have a sizeable area for these activities, but the ocean has been part of the country's international image. In 2018 tourism represented 8% of the country's GVA. That same year, sectors of "Recreation, sports and tourism" represented 71.9% of jobs and 69.8% GVA (91 thousand people and 2.3 billion euros) of the total ocean economy.

However, tourism, recreational boating, and sports pressure marine ecosystem and species, as well as coastal and underwater heritage,

and raise questions about the safety of navigation, especially locally. It is therefore important that the tourist load of different areas, especially those more sensitive, is balanced while ensuring the sustainability of tourism, an important sector of the economy. This has been one of Portugal's concerns, in line with the EU and the European Agenda for Tourism 2050, which is meant to be a roadmap for resilient, innovative, and sustainable tourism. Within this framework, the priority areas of tourism are focused on sea and sun tourism, health tourism (including thalassotherapy), the establishment of underwater archaeological parks and publishing of guides of diving spots, and the development of activities linked to the sighting of cetaceans and other marine species and of scientific tourism. These areas must undergo regular assessments in order to identify the most vulnerable areas in terms of touristic load and establish its range of use. Other concerns to consider are the need to contribute to territorial cohesion through coordinated networks dedicated to nautical activities and ensuring safety at sea in bathing areas for a great part of the year.

In line with the Strategy for Tourism 2027, we should continue to promote attracting cruise routes to Portuguese ports, making it easier for passengers come ashore and mobilize the logistical means associated with large scale operations. This implies a concerted strategy for the management of areas and automatic simplification of procedures.

Recreational boating is growing in Portugal, linked to the promotion of interacting with nature and to existing physical conditions. This is a field with the potential to generate specialized jobs, which brings together several activities and infrastructures, like shipbuilding or dedicated shipyards. This potential is shown by the success of the network of Nautical Stations in Portugal, which diversify the supply of tourism services, reduce seasonality, and create jobs in their areas.

This sector's priority has two main axis: the first is the promotion of a varied infrastructures network to support recreational boating, including maritime-touristic activities, namely by improving marinas, docks, landing docks, and support structures, valuing coastal and marine cultural heritage and the involvement of local communities and public sectors related to security and defence; the second axis is the development of the legal framework of integrated recreational marine activities.

There is a high number of people practicing water sports, both professionally and recreationally. This brings vitality to the locations where



these activities are held and promotes the sustainable, balanced, and safe development of coastal communities. It is also a privileged way to raise awareness to the importance of the ocean. Sailing, surfing, and big-wave sports have largely contributed to this and should be stimulated. There has also been a growing interest in recreational diving.

As for water sports, the priority is the bond between people and the ocean and marine heritage, involving communities, promoting effective links between water sports clubs and associations and schools, for establishing a society more connected to the sea, in its recreational aspects, and to a wider range of people to stimulate professional elite sport. As for the latter, we should continue to foster major international events to project the image of Portugal and continue to develop nautical sports in school; key to reaching this goal, is the support of Sports Training Centres and Team-Groups in the School Sports Programme. We should also highlight the role School Sports plays in the initiation of water sports (like canoeing, surfing, sailing, and rowing) that have contributed to the establishment of local clubs through strong partnerships. In this area, it is essential to stress the role of Sports Training Centres of the School Sports Programme in integrating people with functional limitations (supply of Adapted Sports), in integrating vulnerable children and young people, and in gender equality. Finally, it is important to appreciate the local production of gear for this type of sports. Portugal already has internationally-renown producers of high-quality gear. On the one hand we must promote larger scale production of this gear and, on the other, work towards the recognition and promotion of national quality certification.

PIA9 - Ports, Maritime Transport, Logistics and Communications

In its maritime heritage and Atlantic centrality, Portugal has a strategic position that allows us to continue to invest in Portugal's maritime dimension and its potential as an Atlantic hub in maritime-based global logistics.

Strengthening this position at the crossroads of the main international maritime routes should take centre stage in our actions, namely by investing in container traffic, making the country a hub for freight transported between the European, American, and African continents,

in sustainable maritime tourism, and in services and supply of clean energies.

To this end, the management and promotion of the brand “Portuguese Ports” should be a priority on the international field, making the best use of ports as unifying elements to help Portugal grow as a hub to move goods in the Atlantic, by attracting maritime carriage routes and establishing companies in Portugal, in line with the Strategy for the Increase in Competitiveness of the Network of Commercial Ports in Continental Portugal - Horizon 2026 and the Atlantic Action Plan 2.0 of the EC. In this context, port planning and their relationship with cities and intermodality with the territory, together with the link to international transport networks, and the set of new port expansion projects, should allow us to aim for new dimensions of economic growth and development of the country, by keeping and generating more employment and wealth, always respecting the goals of environmental sustainability and safeguard of cultural heritage. Port planning must provide a more sustainable landscape as it offers emerging possibilities for the people in coastal areas and small businesses, reimagining the future on these areas as an opportunity to implement new and cohesive models of safe, sustainable, inclusive, and resilient port communities. This sector contributes to the success of other areas of the ocean economy, like tourism, fisheries, aquaculture, shipbuilding and repair, and renewable ocean energy.

Additionally, port operation must keep up with the best productivity and security indicators, in a framework of job stability and economic sustainability for all parties involved. We should prioritize modern port management, by establishing long-term relationships with operators standing in the international market and by setting competitive rates, key in attracting services and companies.

All along the logistics chain and, in particular, for new concessions in operational areas, it is essential to continuously adjust to energy transition, computer security, and environmental protection, namely in the waste management of ports and in reducing air and water pollution. Just as important is to continue to invest in state-of-the-art automation, digitalization and simplification of processes. This is why the ocean has a central role in SIMPLEX projects, in terms of simplification, digitalization, but also regarding open data and strict criteria for cyberspace security. In this framework of digital processing, we must safeguard the security of information and cybersecurity, so as to ensure the integrity, availability and confidentiality of information, processes, and underlying business. We must also ensure that online

public services made available at the Sectoral Desks of ocean governance benefit from the creation of a single digital platform to allow access to information, procedures, and services to assist in problem resolution, with the goal of facilitating the integration into the European Digital Single Market, mentioned in the Regulation for the Creation of a Single Digital Platform, making all information on the necessary services and procedures in these topics available on the ePortugal portal.

Ports rethink their storage and processing capabilities in an innovative way and find new ways to meet demand. Furthermore, ports and their maritime and land accesses must be secure and fluid, by implementing development plans and maintaining the right conditions to remain operational.

As for maritime carriage, we must continue to invest in legal simplification and in creating new strategic positioning to improve the reputation and competitiveness of shipping register, in keeping with the required technical discipline and proper monitoring of international bodies, enabling Portugal to acquire premium clients. It is important to stress that in 2020, the International Shipping Register of Madeira was already classified as one of the main European registers. It is therefore important to maintain a wide-ranging, strategic approach that ensures all of Portugal's obligations as a flag state, port state, and coastal state are kept in the scope of the IMO.

Maritime protection and security, in all its aspects, should be a priority, as should all components of green shipping. In this concept, we should redraft marine technology around new construction and maintenance alternatives, emission reduction, and decarbonisation of propulsion technologies, development of autonomous or "smart" vessels, as well as marine information technologies and environmentally sustainable investments. Regarding the latter, we should point out the importance of maritime signalling and we expect to migrate the current signalling systems into new renewable energy-based systems with power autonomy. Port infrastructures also complement the European power grid, by ensuring the supply of the island regions and expanding the potential use of renewable energies from the Atlantic to the European continent.

On the logistics' side, it is also fundamental to invest in infrastructures and equipment that respond to the growth of ports, the increase in the size of ships, and the growing demand for connection to the hinterlands, especially regarding protection structures and maritime

accessibilities, railway and road access, and the development of logistics zones, international trade facilitation areas, not disregarding the development of road, rail, and air connections to the main Trans-European Transport Network (TEN-T). Building partnerships with all public and private actors and the development of intermodal solutions considering all distribution and supply chains should allow us to promote solutions that integrate the activity of logistic chains to support the freight of goods and the "last mile". This growth is to be followed by natural engineering, investing in the recovery of adjacent and coastal marine ecosystems while fostering their resilience and safeguarding cultural heritage.

Because of its location, infrastructures, and other aspects favourable to the sectors of ports and maritime transport, Portugal must also explore opportunities linked to the establishment of mooring points for underwater cables. In a world that is increasingly interlinked, these opportunities include installing interconnection hubs and data centres with the possibility of collecting environmental and seismic information, digitizing the ocean and improving communications facilities within the national territory (continent and islands), increasing wealth and job creation. In this decade, we should seize the opportunity to place Portugal as fundamental for new connections of international underwater cables crossing the ocean.

PIA10 - Shipyards, Shipbuilding and Ship Repair

Shipbuilding and ship repair, as well as the industries producing marine equipment and technologies, are among European strategic sectors, providing jobs and supporting the industrial network of several regions. They are also linked to several other activities that are a priority for Portugal, such as maritime transport, maritime security, renewable ocean energy, fisheries, aquaculture, R&D, and environmental monitoring. This group of industries was considered one of the elements for the success of the Europe 2020 Strategy, as it fits into the priority to develop a knowledge- and innovation-based economy (smart growth), to promote a more effective, environmental-friendly, and competitive economy (sustainable growth), and to stimulate an economy with a high employment rate, while offering social and territorial cohesion (inclusive growth).

In face of the challenges of this sector on the European level, namely the strong competition from Asian countries who provide state aid

to the ship industry sector, and have low prices and differences in currency, the EC has been developing a set of measures included in programmes like LeaderSHIP2015 and LeaderSHIP2020. Europe invested in technological leadership (already existing in select market segments), in the protection of innovation and know-how, and in knowledge-based production, making European ship industry a global leader in the building of more complex and technologically advanced ships when it comes to automation and sustainability.

The Portuguese shipbuilding and repair industry has competitive advantages due to the country's location, in the centre of the main maritime routes, weather, and availability of qualified workers. This is a strategic sector for Portugal, one which provides jobs and wealth to all the various industries along its value chain. It should therefore be supported in the development of technological optimization systems and production control that will allow the country to compete in the European market, based on an image of quality and sustainability. It can also benefit from the development of technologies, like remote earth observation systems, for surveying, controlling, and communicating, investments that are an incentive to the national productive capacity, to reindustrialization, and to the reduction of the dependency of this sector from the outside, as well as promoting the involvement of companies from other sectors in making platforms to be used at sea.

Naval shipyards, especially those of smaller size, must also bolster their ability to respond to the renewal and maintenance of the fishing fleet and of ships and structures that support aquaculture. They must also invest in the collection and transmission of the know-how on the construction and repair of traditional boats accrued over several generations. This is a niche business with high national and international demand in recreational boating. The measures to be defined must be geared towards supporting and boosting activities that, while traditional, include accrued national know-how and have high added value in terms of innovation and development of new products.

National investment in blue R&D will make this sector the leader of a new model of sustainable shipbuilding. Production of clean ships and refurbishment of old ships into clean ones, with fewer carbon emissions (clean ships or green vessels), without discharges into the ocean, and producing less noise, are key factors in fighting climate changes, the loss of biodiversity, and pollution. The same goes for the design and construction of long commercial vessels over 500 GT (approx. 50 m in length) with hulls made entirely of composite materials, to allow for a

significant reduction in the structural weight and increase the stability of the ships, thereby reducing energy consumption, greenhouse gases emissions, and underwater noise. Additionally, the development and use of multi-purpose offshore platforms will allow us to invest in producing and using new forms of power from renewable sources, like, for example, hydrogen. This option, added to establishing synergies with the offshore wind power industry, promotes the country's energy autonomy on the way to carbon neutrality, and it is duly aligned with the National Strategy for Hydrogen, the Industrial Strategy for Renewable Ocean Energy, and with RCN 2050 and PNEC 2030.

The recycling and dismantling of ships, something western countries always associated with work with little added value, not using skilled labourers, may prove an opportunity for Portuguese shipyards. In the turn of the century, the world focused on how unsustainably this waste was treated and, in 2009, the parties within the IMO signed the Hong-Kong Convention, followed, in 2013, by the approval of an EU regulation on the recycling of ships. In this context, Portugal may play a key role by partly converting its shipyards, thus contributing to a more sustained performance of this activity, reinforcing the security and protection of human health and the marine environment, along the full life cycle of a ship.

Finally, logistic equipment that serves the maritime trade industry are another likely investment on the way to reindustrialization. The fact that much of this equipment is constructed outside Europe brought to light strategic risks and economic threats, which call for industrial investment in this field, namely maintaining or acquiring new skills and know-how; for example, the acquisition of productive capacity of essential resources, such as containers, or resources that support the handling of maritime freight. This investment in reindustrialization must be coupled with technological innovation programmes, centred on the production or re-use of materials and processes, in line with environmental sustainability concerns.

PIA11 - Coastal Management, Construction and Infrastructures

The coastline is a very relevant part of our territory, one that is important to preserve and defend, investing in a policy of sustainable integrated management. The coastal area is particularly relevant for the support of an important group of economic activities (commercial fishing, aquaculture, tourism, coastal recreational

activities, recreational boating, and port activity), some geared towards the appreciation of sea resources, others receiving positive externalities from their proximity to the sea. The coastal strip, a place of convergence for land and marine processes, shows blurred borders, varying greatly with space and time. It is not limited to the land-ocean interface, rather reflecting the physical interaction of these two dimensions, even from great distances, because of weather, seismicity, river basins, or activities dependant on both banks, and, as such, it must be managed and developed considering the four aspects: ocean, land, cultural heritage, and environment. To this end, we must ensure the continuous articulation between the instruments of Maritime Spatial Planning and special planning policies and their respective legal frameworks.

In 2017, the *Litoral XXI* Action Plan was drafted. This is an important tool for an active management of the coastal area, as it reflects the major policy lines and strategic options for the coast and identifies and prioritises the wide array of physical interventions that must be carried out by the various organisations active in the coast while the National Strategy for the Integrated Management of the Coastal Area is in force. These interventions focus on risk prevention and on the safeguard of people and property, protection and acknowledgement of natural heritage, Sustainable Development of economic activities, and management of inland water resources that ensures the progressive resetting of sedimentary cycles. Considering the goals and 20-year horizon mentioned in the Strategy for the Integrated Management of the Coastal Area, the drafting of the Action Plan focused on the interventions that must be carried out along the coast and are included in the execution of the Planning for the Coastal Strip in force, and in the new Coastal Strip Programmes and other national initiatives, namely those carried out by the Polis Litoral Societies and those relating to the increase in knowledge and monitoring of the coastal area, such as the Global Programme for the Systematic Monitoring of the Coastal Area of Continental Portugal (COSMO) and the System for the Administration of the Coastal Resource (SIARL), among others.

The integration of a holistic ocean-land vision in the management of the coast and coastal strip, but also of all infrastructures present and future, should be the common thread for the next decade. Coastal areas are vulnerable to the rise of sea level, extreme weather events, tidal waves and coastal erosion. These are perfect examples of the ever-growing role the ocean plays in the changes in geography of those areas and how innovative solutions for new natural engineering

can adjust to these changes. The use of new biomaterials and ocean-inspired engineering solutions, as well as the preservation of coastal ecosystems, represent unique opportunities in fostering coastal resilience. The stimulation of circular economic activities promoting decarbonisation along the coastal strip and fostering a new blue industry with a highly technological and digital base, and modern infrastructures for the protection, access, and use of the ocean should be safe investments for Portugal, as a maritime nation and an example of preservation and resilience of the coastal strip.

PIA12 - Non-living Resources

Knowing the distribution and use of the ocean's non-living resources has a strategic interest that goes beyond the economic value the resources may have. On the one hand, it stimulates the development of technologies with applications in other sectors of the blue economy. On the other, the resources range from water to sand, salt, hydrogen, or metals and these may play a key role in meeting several of the SDGs of the UN 2030 Agenda and the fundamental targets of that strategy. However, it is important to mention that the technological challenges are still significant in some of these fields, when it comes



to viability and, mostly, when regarding the environmental impact of the exploitation of these resources.

The extraction of marine minerals is legitimately seen with some concern by various sectors of society. This concern stems typically from the environmental and heritage-related impact that may occur when extracting these materials from the seabed. However, among these resources are metals (namely some with high-tech applications) that can play a relevant role in the decarbonisation of the economy. The strategy set out in the European Green Deal presented by the EC considers that one of the prerequisites to energetic transition is the access to sustainable raw-materials, especially those necessary for the development of clean technologies, and of digital, special, and defence applications, diversifying the supply from primary and secondary sources. Portugal's vision is in line with this European strategy and with the development of the blue economy as one of the pillars for decarbonisation and promotion of renewable power sources and energetic autonomy.

The physiography of the marine region under Portuguese jurisdiction has enormous variety, with an interval of depths that goes from the passive continental margin to the mid-Atlantic ridge, with constant volcanic activity. The non-living resources linked to these different contexts have yet to be fully surveyed, both concerning the sand and gravel deposits in the continental shelf and insular platforms, as well as the metallic mineral resources in deeper areas. In several countries of the EU, the extraction of sand and gravel is the basis of relevant economic activity linked to "Blue Growth", unlike the exploitation of metallic resources in the deep sea, which is yet to be approved. In addition to the technological challenge involved in the exploitation of resources located hundreds or even thousands of metres below surface, the largest hurdle to these projects relates to the need to better understand and survey the various ecosystems and the role they play with clear benefits to humanity, as well as extraction methods and technology and the secondary effects of the dispersion of plumes and/or potentially toxic metals and noise. The impact of deep-sea mining is not limited to the place of extraction, due to the three-dimensional nature of the water column and the complex structure of the circulation of the water masses with enough density to carry and redistribute elsewhere the generated plumes.

We have very little geological knowledge of the mineral resources on the seabed under Portuguese jurisdiction, and this is why it is of strategic importance for the country to assess this potential, as

well as the spatial distribution of any possible stocks, by promoting and supporting informed decision-making. The advances in this area are aligned with the SG on Stimulating Scientific Knowledge, Technological Development and Blue Innovation. This investment in science is also crucial for establishing model zones and to support the planning and management of the Portuguese maritime space, minimizing potential conflicts and establishing a sustainable use of marine resources.

One of mankind's main concerns is the availability of freshwater in sufficient quantity and quality. This seems to be even more relevant in the future due to climate changes. Desalination allows us to produce safe freshwater, from a microbiological (bacteria and viruses) and chemical (organic matter, chemical pollutants, contaminants of emerging interest) standpoint. There is already modular, compact, and easy-to-remotely-control technology suited to centralized (facilities with greater capacity, lower unit costs) and decentralized (low-capacity facilities, higher unit costs) systems, including hotels and other establishments, as well as to fuel ships.

The desalination of sea water by reverse osmosis is an energy-intensive process, but its environmental sustainability increases when using renewable energy sources. The development of systems with low energy consumption and low carbon emissions is touted as being the future of the desalination of sea water and, on a national scale, we have the know-how and scientific and technological capabilities to innovate, build, and scale-up new solutions for treatment with reverse osmosis or other types of membranes. Systems of this type are already active in Portugal, namely in the Autonomous Region of Madeira, where the Desalination Central of Porto Santo has been active for over 40 years and is the sole source of drinking water for the islands' public supply.

PIA13 – Maritime Security, Defence and Surveillance

For several different reasons, including its importance to environmental sustainability, to the growth of the Portuguese economy, creating jobs, increasing the well-being of citizens, and bolstering Portugal's position globally as a relevant and responsible maritime nation, the ocean represents one of the country's most important strategic assets. This is also why maritime security – in its environmental, economic, social, and geopolitical aspects – must be a

strategic priority for Portugal. It is an essential condition for the promotion of the quality of the environment, economic sustainability, and human safety, as well as for ensuring the sovereign rights attributed by UNCLOS, simultaneously contributing to the international governance of the ocean. There is, in fact, mutual influence between maritime security and the other intervention areas, as this sector is a direct driver for science and innovation, robotics and digital technologies, shipyards, and shipbuilding and ship repair, all critical sectors for the development of maritime surveillance systems, naval means and information, and communication systems used in the operational activities of maritime security. Additionally, maritime security provides the necessary conditions for the success of the remaining intervention areas linked with culture, the classification of marine protected areas, the furthering of Blue Biotech, the sustainability of fishing and other activities that exploit marine resources, environmental monitoring and the protection of human health, energy use, and the promotion of coastal and nautical tourism.

In holistic terms, maritime security can be seen as a desired status in global maritime control, where maritime disputes are resolved peacefully, where international and national laws are respected and applied, freedom of navigation is ensured, and people, infrastructures, transport, the environment, and marine resources are protected.

Faced with the undeniable interdependency between development and security, Portugal must consider a strategic response to the risks and threats to maritime security that jeopardize the national development goals and the well-being of the Portuguese people. To that end, we must draft and execute a National Maritime Security Strategy, duly articulated with the current NOS 2021-2030, and that considers other structuring documents, such as the Strategic Concept of National Defence, the Technological and Industrial Basis for Defence, the EU Maritime Security Strategy, and the NATO Maritime Strategy, among others.

Synergies resulting from the connection of the future National Maritime Security Strategy and NOS 2021-2030 are key for the achievement of national goals in the maritime sector, favouring situational awareness and interagency and international cooperation. Moreover, in order for Portugal to be able to safeguard human life in the wide maritime area under our control, as well as exercising the state's authority and the control of maritime regions under Portuguese sovereignty or jurisdiction, the country must improve its maritime situational awareness by increasing the integration and merge of

information obtained from various sources. This additional situational awareness will allow for the identification of unusual behaviours and to anticipate risks and threats, maximising the efficacy and efficiency of action at sea, bearing in mind that the means are always limited *vis a vis* the size of the national maritime space.

Additionally, as we acknowledge the network of organisations competent to execute the state's authority at the ocean, compounded by the international organisations Portugal is a part of, it is important to stress the concerted action of the state's pertinent tools (civilian and military), the private sector, and international partners in order to face the global security challenges in the maritime space under Portuguese sovereignty or jurisdiction, or other areas of maritime security that affect national strategic interests. The Inter-ministerial Committee for Ocean Affairs - CIAM is tasked with ensuring the articulation between agencies, on a national level, and must promote the bolstering of the role of the National Maritime Coordinating Centre, the National Coordination Centre, the EUROSUR, and the Maritime Operations Centre.

The NOS 2021-2030 is aligned with the EU's Maritime Security Strategy and its Action Plan and with the EU's Internal Security Strategy (2019-2024), and it prioritizes quick response capabilities at the ocean, proactive attitudes in the development of new technologies, the integration of a European surveillance system, and operational multilateralism, the latter also supported by the FRONTEX Programme (2020-2022) and by the Strategy of the European Agency for Maritime Safety (2020-2024). In order to meet the issues raised by maritime migrations, we must ensure all is aligned with the National Strategy for Integrated Border Management (2020-2023) and its Action Plan (2020-2023).

Finally, we would like to highlight the exceptionally international nature of maritime security, brought about by the absence of full sovereignty of coastal states over the maritime areas under their jurisdiction – which has led to the signing of several international agreements – and by the ever-growing intervention of international organisations in the area of security. In order for Portugal to stake its claim as a leader in ocean governance and as a co-developer of global maritime security, it is essential to ensure coordinated actions among the various political, diplomatic, and military actors, as well as security forces and services, in the multiple international forums in this field. It is also fundamental to participate, in cooperation with other states, in joint maritime security activities that contribute towards

safeguarding national interests. Within this context, it is especially relevant the operationalization of the Atlantic Centre. This Centre not only advocates for the development of capacities linked to the security in the Atlantic, especially focused on the maritime aspects, but it also seeks to promote cooperation with and between different international organizations like the UN, EU, CPLP, African Union, as well as the Atlantic community as a whole.













6. TARGETS AND IMPLEMENTATION

The NOS 2021-2030 has a long-term vision that materializes in the definition of objective measures for all priority intervention areas, collated into an Action Plan that will be regularly updated to meet the Strategic Goals defined for the decade. To precisely establish the implementation and impact of the NOS 2021-2030, and acknowledge its successes and shortcomings, we must first set up a plan for its control and monitoring and define concrete and quantifiable targets that complement one another. The targets set in this chapter, listed in Table 2, are aligned with the 10 Strategic Goals for the NOS 2021-2030 and are one of the main tools for its monitoring and assessment. Their methodology is described in the following chapter. All targets are set for 2030, and the base year is 2020, the nearest year before that for which data is available.

Table 2
NOS 2021-2030 Targets by Strategic Goal

Strategic Goal (SG)	Targets for 2030
 SG1 Fight Climate Change and Pollution and Protect and Restore Ecosystems	<p>To ensure that 100% of the maritime space under Portuguese sovereignty and/or jurisdiction is given Good Environmental Status</p> <p>To classify 30% of national maritime area as protected by 2030, approving the respective management and conservation plans, and to ensure that 1/3 is strictly protected</p> <p>To ensure that 100% of plastic packaging marketed in Portugal is reusable or recyclable</p>

Strategic Goal (SG)	Targets for 2030
 SG2 Foster Employment and a Circular and Sustainable Blue Economy	To ensure that 100% of commercial and fishing ports and marinas have environmental management systems for water, wastewater, waste, and power
	To increase jobs in domestic blue economy by 30% by 2030
	To ensure average salaries in the ocean economy 8% above the national average
	To increase Gross Value Added (GVA) of the ocean economy by 30% by 2030
 SG3 Decarbonise the Economy and Promote Renewable Energies and Energy Autonomy	To increase the rate of the ocean economy to 7% of GVA of the national economy
	To double the number of financing instruments dedicated to blue economy projects (for example, sustainable financing, crowdfunding, venture capital)
	To reach at least, 370 MW installed capacity to generate power from oceanic renewable sources
	To ensure a 17% cut in greenhouse gases emissions from the ocean economy, as compared to 2005, in line with Portugal's commitment to the Effort Sharing Regulation for 2030 for sectors outside the EU ETS
 SG4 Invest in Guaranteeing Sustainability and Food Security	To increase national aquaculture production to 25,000 t/year
	To increase to 7% the quota of exports of sea products in the total national exports
	To keep 100% of fishing stocks within sustainable biological limits, following the parameters from the scientific assessment (i.e. ICES), adjusting the limits of the fishing effort to those levels
 SG5 Facilitate Water Access & Supply	To double the number of desalination units to supply freshwater on a national level

Strategic Goal (SG)	Targets for 2030
 SG6 Promote Health and Wellbeing	To increase the number of health and well-being tourism projects linked to the therapeutic qualities of the ocean
	To double the number of participants in water sports
 SG7 Stimulate Scientific Knowledge, Technological Development and Blue Innovation	To double the number of blue economy start-ups as well as the number of innovative blue projects financed by operational programmes
	To increase the number of MSc and PhD degrees in ocean-related scientific areas by 50%
	To increase by 60% the number of ocean-linked infrastructures in the National Roadmap for Strategic Interest Research Infrastructures (RNIE)
	To increase the number of days at sea of oceanic research vessels by 30%
 SG8 Improve Education, Qualification, Culture and Ocean Literacy	To double the number of national IPR applications (patents, brands, and design), in ocean and ocean-affiliated technologies (technology, industrial, empowerment)
	To increase European financing for professional training in ocean economy, promoting the participation of women and girls
	To double the number of workers in ocean-related activities with post-secondary education through level 5 of the National Qualifications Framework - QNQ, under the National Qualifications System - NQS, developed by entities trained under the NQS, as well as Higher Education courses of level 6, 7, and 8 of the QNQ and Professional Technical Courses - CTeSP, also developed by higher level institutions but that currently lack the qualification degree or level

Strategic Goal (SG) Targets for 2030

To double the number of young people and adults trained with double certification in the sectors and activities linked to ocean economy

To ensure that 20% of Ciência Viva Clubs at school include in their activities plans an exploration of the topic “ocean”

To ensure an increase of 10% in the number of Sports Training Centres within the School Sports Programme (Water Sports) and the number of Group Teams of School Sports in water sports (Canoeing, Surfing, Sailing, and Rowing)

To increase financing for the surveying, monitoring, and recovery of coastal heritage integrated into cultural landscapes

To increase the number of classified nautical and underwater cultural heritage buildings by 20%



SG9 Incentivize Reindustrialization and Productive Capacity and Ocean Digitalization

To increase the value of industrial production of emerging sectors in the ocean economy by 20%

To increase the financial support provided to innovation, transfer of technology, and diversification of production models in the traditional sectors of ocean economy by 20%



SG10 Ensure Safety, Sovereignty, Cooperation and Governance

To ensure the UN adopts the global agreement for conservation and sustainable use of marine biodiversity in areas beyond Portuguese jurisdiction

To finish the process for the extension of the Portuguese continental shelf

To fully activate the planning and management of the national maritime space





7. MONITORING AND ASSESSMENT

The NOS 2021-2030 and its Action Plan are monitored and assessed to ensure their effective and efficient implementation and to certify that the proposed targets are met. This monitoring and assessment are the basis for decision and require a coordination between the public and private agents involved in the governance model of the NOS 2021-2030. This assessment process also ensures the availability of information to be used for its revision, including the allocation of funds and the establishment of strategic partnerships. This approach is the result of the experience gained in the follow-up and assessment of previous strategies.

The monitoring and assessment of the NOS 2021-2030 are transparency and accountability tools in a framework that must be modern, flexible, and collaborative, based on systems of open data and reuse of public data, in the scope of the requirements of the Strategy for Innovation and Modernization of the State and Public Administration 2020-2023. In the era of digitalization, data sharing, systems interoperability, and web services are well established and the monitoring of the NOS 2021-2030 must follow the trends in this field.

The NOS 2021-2030 is the main tool for a national integrated maritime policy. While monitoring it, we must be able to get an overall picture, breaking with sectoral and exclusively domestic approaches.

The NOS 2021-2030 is the main tool for a national integrated maritime policy. While monitoring it, we must be able to get an overall picture, breaking with sectoral and exclusively domestic approaches. We must therefore ensure the follow up of impacts or compounded effects, of elements that span across several fields, and compatible territorial disaggregation. We would like to point out the separation in NUT I and NUT II and by municipalities. The latter are especially relevant in the framework of the ongoing decentralization that establishes the competency of municipalities within this Strategy,

as areas with maritime activities, as well as ports and beaches. The interconnection of the various agents to ensure a coordinated and timely response on an international level, and the integration with the data and monitoring communities in the ocean, should be central to the monitoring of the NOS 2021-2030.

The monitoring of the NOS 2021-2030 must not only ensure support information for the CIAM but also contribute towards increasing ocean literacy and strategic communication, in terms of society as a whole. It must also safeguard coordinated and compatibilized information, necessary to other processes, namely Portugal's contributions to the implementation of the Marine Strategy Framework Directive (MSFD), for the European Agency for the Environment and the OSPAR Convention, for the UN Regular Process, for the socioeconomic component of the use of maritime waters, for the EC concerning Portugal's contribution to "Blue Growth", and for the OECD. Furthermore, it must collect all information necessary to assess the state of implementation of the national Maritime Spatial Planning and to monitor the impact and results of Portugal 2020 and Portugal 2030 Programmes in the ocean. The monitoring of SDG 14 of the UN 2030 Agenda and of the 2001 UNESCO Convention on the Protection of the Underwater Cultural Heritage in Portugal must also be considered.

Monitoring is based on the SEAMInd project – Economic, Social, and Environmental Indicators, which is part of a collaborative network coordinated by the DGPM, with the purpose of identifying a strict number of relevant indicators to establish the results of sea policy. These indicators will allow us to determine whether the results are in line with the goals of the NOS 2021-2030.

SEAMInd's collaborative network integrates public organisations (including municipalities) that make available – or may do so in the future – indicators related to matters of the ocean (as per the supply) and should be established by a protocol of institutional cooperation between these entities and the DGPM. SEAMInd is national in scope and, as the Autonomous Regions are part of the network (as per supply and demand), the DGPM must link up with the regional organisations in charge of ocean affairs.

The Strategic Goals, regarded as long-term goals in this context, are measured by impact indicators. Each target is measured by at least one economic, social, or environmental indicator. For example, the GVA of the ocean economy, the percentage of marine area

classified as having Good Environmental Status, the number of days at sea of oceanic research vessels, and the number of participants in water sports are considered indicators. The goals of the intervention areas, in the mid-term, are assessed by result indicators. The indicators to be adopted must consider the harmonization with other indicator systems, defined to follow-up on other policies relevant for the articulation with this strategy. The Action Plan, that integrates projects, actions, programmes, and sectoral strategies, is monitored through the identification of flagship and/or pivotal actions, with result indicators, relevant products, and financial indicators, as well as their respective implementation status. The projects of private nature included in the Action Plan individually, and being identified as structuring projects in the context of the goals for the NOS 2021-2030 and/or because their implementation requires the joint cooperation of several public bodies, will be monitored considering the state of interaction with public entities. In the governance model for Portugal 2020 and Portugal 2030, it is the DGPM, as the entity responsible for the monitoring of NOS 2021-2030, that ensures the monitoring of the implementation of European shared management funds for all projects in the ocean, in conjunction with the Operational Programmes. The list of indicators must be stable but subject to being perfected, and is currently published on the DGPM website, along with any updates developed and agreed upon by SEAMInd's collaborative network, which is a functional articulation tool in the context of the NOS 2021-2030.

A long-term and structural analysis must be carried out based on National Accounts, namely the Ocean Satellite Account, drafted by the INE, to be published at least every three years. The INE and the DGPM ensure the necessary linkage and work for the continuation and improvement of the Ocean Satellite Account and will assess the need to bolster the analysis of ocean economy in the framework of National Accounts. In this framework we must consider the development of Experimental Accounts for the Environment and Ecosystem Services (marine), and to that end rely on SEAMInd's collaborative network.

Monitoring will, preferentially, be based on microdata already collected by the public administration, in terms of statistical, administrative, or scientific data, and we should stress the strict collaboration with the INE and DGRM. We must ensure the interoperability with existing systems, namely with SNIMAR, the Logistics Single Window, and others deemed relevant. As for environmental data, the monitoring must ensure coordination with IPMA and the Hydrographic Institute (HI) as State Laboratories, and with other entities with equivalent

data in the Autonomous Regions and with the National Maritime Authority (NMA) concerning marine pollution.

The DGPM must ensure its website has a matrix that identifies the link between monitoring of NOS 2021-2030, the use of marine waters for the MSFD, and the implementation status of Maritime Spatial Planning, with the groups of the Ocean Satellite Account and the monitoring areas of SEAMInd, in articulation with the DGRM. Monitoring includes the drafting and publishing by the DGPM of a yearly report on the implementation status of the NOS 2021-2030, based on the targets and indicators, and the implementation of the respective Action Plan.





8. MODEL FOR GOVERNANCE, COORDINATION, AND RESOURCE MOBILIZATION

The ocean has a global dimension and the challenges it faces know no borders, inciting strong international, national, regional, and local cooperation. The ocean economy is a promising prospect, but we must ensure sustainable growth that takes into consideration the value of natural capital and the services of marine ecosystems, as well as the safeguard of cultural heritage. The ocean-atmosphere system and its monitoring and connection to Maritime Spatial Planning and coastal area management are crucial elements for ocean governance.

Articulation with current international processes, with strong and coordinated Portuguese presence in various forums, including UNCLOS, UN 2030 Agenda for Sustainable Development, UN Decade on Ecosystem Restoration, UN Decade of Ocean Science for Sustainable Development 2021-2030, and the Regular Process for Global Reporting and Assessment of the State of the Marine Environment including Socioeconomic Aspects, is key for ensuring Portugal's active participation in the main organisations within the conventions and other entities the country is a part of, namely the UN processes linked to the ocean, International Maritime Organization, Commission on the Limits of the Continental Shelf, International Seabed Authority, and UNESCO Intergovernmental Oceanographic Commission.

The cooperation of the CPLP in ocean affairs is part and parcel of the Portuguese cooperation strategy. It is also fundamental to ensure a link with the OSPAR Convention, in order to guarantee regional cooperation pursuant to the Marine Strategy Framework Directive, as an environmental pillar of the EU's Integrated Maritime Policy (IMP), and to ensure synergies with the Birds and Habitats Directive and with the Water Framework Directive, namely in meeting the goals of the EU's Biodiversity Strategy for 2030. Portugal's active, strategic, and mobilizing participation at the level of the IMP is elemental, both for a more maritime Europe, as to the pursuit of the national mobilization towards the ocean, in a participating, targeted, and articulated manner between public and private agents. The EU has invested in cooperation in transatlantic I&I, first with the Galway Statement, signed with Canada and the USA, and then with the Belém Declaration,

signed with Brazil and South Africa. Portugal must continue to play an active role in this field.

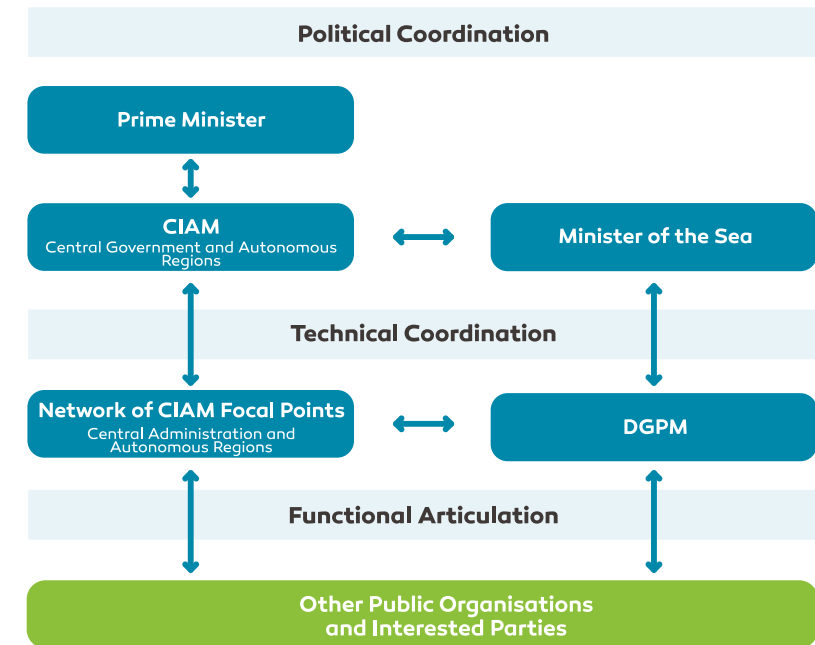
The Autonomous Regions of the Azores and Madeira, with their own and shared competences, play a key role in the governance model for the NOS 2021-2030, and we must think of the link to the maritime dimension of the EU strategy for outermost regions.

At the national level, it is absolutely fundamental that the policy for the ocean is drafted in articulation with the Autonomous Regions and aligned with the NOS 2021-2030 and the tools of Maritime Spatial Planning and land management. This strategy must ensure horizontal or intersectoral coordination and articulation, as well as vertical coordination, considering the tools of territorialisation of ocean policy and their international linkage. Consultation, follow-up, and participation of all actors involved in ocean affairs is assured by guaranteeing functional and complementary top-down and bottom-up governance, and by narrow cooperation in a flexible, dynamic, and operational model.

The governance model for the NOS 2021-2030 includes political and technical coordination. Political coordination is assured by the CIAM, responsible for strategic reflection, coordination, and decision on the ocean, presided over by the Prime Minister. CIAM is supported by a network of focal points appointed by members of the Cabinet and Regional Governments within the CIAM. DGPM is responsible for technical coordination, ensuring the necessary logistic, administrative, and technical support for the good functioning of the CIAM. DGPM is also the secretariat at CIAM meetings and coordinates the aforementioned network of focal points.

DGPM ensures the functional connection between private and public organisations that supports the implementation, monitoring, assessment, and revision of the NOS 2021-2030. This connection must establish a collaborative and transparent atmosphere for the implementation of NOS 2021-2030, both horizontal and vertical, including the international aspect. These connection tools may be established by cooperation protocols between public and private bodies and can be permanent or temporary for specific actions. Territorialisation of the NOS 2021-2030, through smart specialization strategies of national and regional scope, will be assured through dedicated functional articulation.

Figure 1
Governance model for the NOS 2021-2030



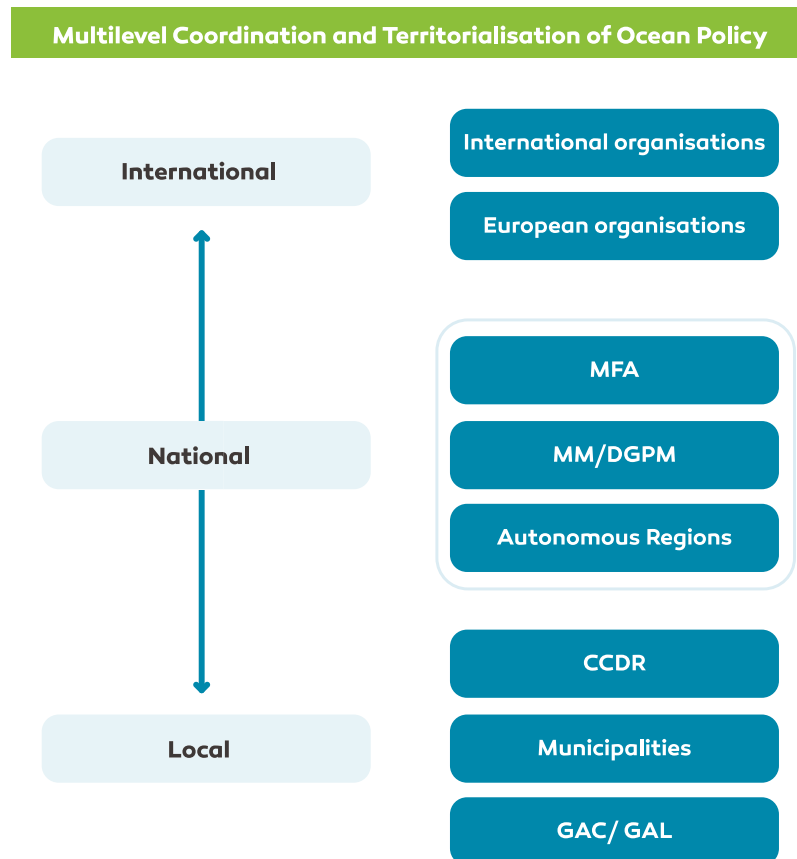
The integrated territorial Investment tool for the Ocean (ITIMar), developed under European Structural and Investment Funds (ESIF) and the governance model of Portugal 2020, with the exception of the European Agricultural Fund for Rural Development, contributed to the execution of the NOS 2013-2020 in the context of Portugal 2020.

The sub-regional strategic framework for the NOS 2013-2020, under the ESIF, was secured by the implementation of the ocean component of the integrated territorial development strategies, as set by Intermunicipal Communities - CIM and Metropolitan Areas - AM. CIM and AM with a significant ocean component in their integrated territorial development strategies applied for the recognition of this fact with the context and purposes of the NOS 2013-2020. This recognition was ensured through cooperation protocols signed between the DGPM, the Committees for Regional Coordination and Development - CCDR, and the CIM (or AM), in order to articulate the implementation of ocean policies on a sub-regional level, namely

at the level of the Nomenclature of Territorial Units for Statistics (NUT III).

In the context of the future Multiannual Financial Framework (MFF), ITIMar will contribute to the operationalization of the NOS 2021-2030, including the intervention areas with a mostly national or regional scope in the respective reference framework.

Figure 2
Follow-up of the NOS 2021-2030



In order to ensure the success of the implementation of the NOS 2021-2030, it will be necessary to mobilize the financial, human, and physical means, infrastructures, and information, a central topic in terms of coordination by the CIAM, supported by a functional link between public and private organisations.

The implementation of the NOS 2021-2030 will make use of the available financial resources. Its success may greatly hinge on the work of the ITIMar Implementation Committee, a part of Portugal 2020, complemented by equivalent and functional articulation within the NOS 2021-2030, namely between smart specialization strategies and financing entities in the ocean sector, and future articulation with Portugal 2030. This guarantees all the conditions for effective and efficient articulation when using the ESIF for the shared management of national funds, like the Blue Fund and the Environmental Fund, of the EEA Financial Mechanism (EEA Grants), and of other public and private investors in Portugal with interests in the ocean. Beyond the shared management funds, which include the territorial cooperation programmes under INTERREG, essential to the deepening of the cooperation networks in Europe and, especially, in the Atlantic, we must consider the EC's centralized management programmes, such as Horizon Europe, InvestEU, COSME, Connecting Europe Facility, Erasmus+, and LIFE.

For promoting the external action of the NOS 2021-2030 and its contribution to the implementation of the UN 2030 Agenda at other locations, it is essential to consider partnerships in projects supported by EU external cooperation financing mechanisms, as well as those of the Development Banks which Portugal integrates.



9. 30 FLAGSHIP ACTIONS FOR THE OCEAN 2030

The aim of the National Ocean Strategy 2021-2030 (NOS 2021-2030) Action Plan is to be a roadmap to the implementation of the NOS itself and corresponding strategic goals and targets, as well as a guide to its monitoring and assessment.

Regarding the implementation of the NOS 2021-2030, the Action Plan includes several actions distributed by the various priority intervention areas.

Table 1 highlights 30 flagship actions, set as so for their scope and multiplier effect.

Table 2 is a matrix table outlining the structure and rationale of the Action Plan, indicating for each priority intervention area (described in rows), as well as for each strategic goal (described in columns), the group of relevant flagship actions that contribute to their implementation, allowing the user to quickly refer to the desired subareas of interest.





Now that the Action Plan has been approved, it will be analysed by the Inter-ministerial Committee for Ocean Affairs (CIAM), and the timeline for the implementation of each action will be defined, as well as the entity in charge of its coordination.









The actions listed in this Action Plan are grouped into macro-categories, such as finance and tax-benefits, administrative simplification and modernization, support of ocean literacy and qualification of human resources, development and implementation of infrastructures, generation of knowledge, data, information, implementation, security, fostering of innovation and technological development. This classification is essential to the Action Plan follow-up by the CIAM, with the goal of ensuring the implementation of the NOS 2021-2030 and its monitoring, based on the functional articulation of public and private organisations.










This Action Plan will undergo regular reviews, namely at the beginning of each legislative period, so as to include, among others, the relevant actions of each Government Programme.





The governing organisations of the Autonomous Regions may, within the scope of their remits and if they so choose, approve regional action plans with actions and projects that contribute to the strategic goals of the NOS 2021-2030.

Table 1 - 30 Flagship Actions for the Ocean 2030

Strategic Goal (SG)	Action Number	Action Description
 OE 1	1	To implement a national programme for the mapping of marine and coastal habitats, ecosystems, and services, including a status assessment and application of priority restoration measures
 OE 1	4	To classify as protected and effectively manage at least 30% of the ocean waters under Portuguese jurisdiction, pursuant to the European and international goals, including 10% of these areas under strict protection. Additionally, to implement the Portuguese Network of Marine Protected Areas (RNAMP)
 OE 2	26	To operationalize the Ocean Campus with all applicable infrastructures and networks, including establishing the Blue Hub to collect all information on biobanks and national marine collections
 OE 2	36	To draft the strategic plan for seaports infrastructure based on alternative, renewable, and sustainable fuels
 OE 2	44	To establish incentives for stimulating highly qualified blue jobs (Blue Job Voucher)
 OE 3	67	To foster the financing of entrepreneurial and innovation blue economy projects that promote and develop decarbonization, sustainability, circularity, and efficiency models with a positive impact on biodiversity
 OE 3	72	To decarbonize and foster energy transition, efficiency, and autonomy in the ocean economy sectors, the development of technology, and the production of renewable ocean energy
 OE 4	74	To implement national roadmaps for offshore aquaculture and recirculation systems, by fostering research, development, and innovation (R&D&I) geared towards innovative tech solutions for the development of such systems
 OE 4	76	To foster the full valorisation of fish and fish products by continuing to invest in innovation, by improving working conditions and safety on board, food safety, and energy efficiency in fish storage, and implementing molecular tracing of fish source

Strategic Goal (SG)	Action Number	Action Description
 OE 4	77	To convert Portuguese fisheries into one of the most sustainable and low-impact sectors worldwide by 2030, stimulating the allocation of grants for the promotion of sustainable fishing and eliminating all grants harmful to the conservation of the marine environment
 OE 4	81	To prioritize the development of sustainable and circular aquaculture, offshore and in transition and inland waters, and nurture closed-circuit multitrophic production
 OE 5	87	To foster the development of desalinating technology by implementing a domestic 2030 roadmap for desalination, subject to a Strategic Environmental Assessment, so as to gauge the impact its implementation has on the environment
 OE 5	88	To develop quantification and projection models over ten years for the deficit of supply-over-demand of water in coastal areas all year round, by type of use (human consumption, tourism, industry, agriculture, irrigation), and that take into account water from other sources, namely the reuse of treated wastewater and the promotion of water efficiency policies across all sectors
 OE 6	90	To ban, by 2021, specific types of single-use plastics for which there are more sustainable alternatives and to promote a reduction in plastics' use, as well as their reuse and recycling
 OE 6	91	To develop and validate tools that allow to monitor emerging pollutants and toxins in marine-sourced products meant for human consumption or animal feed production
 OE 6	92	To develop an innovative programme on Tourism and Health with three action areas: knowledge, innovation, and community
 OE 7	96	To implement a national programme for the observation, high-resolution mapping, and knowledge of the deep sea in the Exclusive Economic Zone (EEZ) and extended continental shelf











Strategic Goal (SG)	Action Number	Action Description
 OE 7	98	To promote a multidisciplinary R&D&I financing programme for ocean sciences, involving the Portuguese scientific and technological system and the industry, for the development of innovative goods and services in the blue economy
 OE 7	105	To develop technology and to promote surveys to assess the environmental, social, and economic impacts of deep-sea mining
 OE 8	112	To build an integrated strategy to develop inclusive and holistic ocean literacy, including education, qualification, culture, science, and environment
 OE 8	118	To identify strategic areas and update the National Qualifications Catalogue through the ocean-specific Sectoral Council for Qualification
 OE 8	123	To promote Portuguese ocean culture and history by directly supporting various initiatives and ocean-related contemporary and traditional art forms, in Portugal and in Portuguese schools abroad
 OE 8	127	To promote the inventory, scientific knowledge, and classification of nautical and underwater cultural heritage (using robotics), including it into coastal management and policy-decision tools, namely the Maritime Spatial Planning Plan
 OE 9	140	To establish an open access national database with ocean information that includes data collected by foreign research vessels in waters under Portuguese jurisdiction
 OE 9	144	To promote the digitalization of fisheries, fish-processing, and aquaculture 4.0 industries to increase production efficiency and sustainability
 OE 9	152	To create a reindustrialization programme in the blue economy, prioritizing bioeconomy, clean technology, natural engineering, robotics, and sensors, and the full digitalization of the ocean economic sector











Strategic Goal (SG)	Action Number	Action Description
 OE 10	163	To ensure the implementation of NOS 2021-2030 using the available financial resources as well as those of the Implementation Commission for Ocean Integrated Territorial Investment (ITIMar), as included in Portugal 2020, and the future articulation with Portugal 2030, as well as its monitoring by the SEAMInd Platform
 OE 10	165	To operationalize the Atlantic Observatory in coordination with the Atlantic International Research Centre (AIR Centre), involving the Autonomous Regions of the Azores and Madeira
 OE 10	170	To develop a National Maritime Security Strategy in line with the EU Maritime Security Strategy
 OE 10	172	To develop a programme to build manned and unmanned naval and aerial means for the surveillance, inspection, and control of the ocean and coast











Legend:











- SG1** - Fight Climate Change and Pollution and Protect and Restore Ecosystems
- SG2** - Foster Employment and a Circular and Sustainable Blue Economy
- SG3** - Decarbonise the Economy and Promote Renewable Energies and Energy Autonomy
- SG4** - Invest in Guaranteeing Sustainability and Food Security
- SG5** - Facilitate Water Access & Supply
- SG6** - Promote Health and Wellbeing
- SG7** - Stimulate Scientific Knowledge, Technological Development and Blue Innovation
- SG8** - Improve Education, Qualification, Culture and Ocean Literacy
- SG9** - Incentivize Reindustrialization and Productive Capacity and Ocean Digitalization
- SG10** - Ensure Safety, Sovereignty, Cooperation and Governance











Table 2 - Matrix of Flagship Actions by Strategic Goal (SG) and Priority Intervention Area (PIA)

	PIA 1	PIA 2	PIA 3
 SG 1	1, 26, 36, 67, 72, 77, 90, 105, 165		1, 4, 26, 67, 77, 90, 165
 SG 2	1, 26, 36, 44, 67, 72, 74, 76, 77, 81, 90, 96, 98, 105, 140, 144, 152, 163, 172	44, 118, 163	1, 4, 26, 44, 67, 77, 81, 87, 90, 96, 98, 140, 163, 172
 SG 3	26, 36, 67, 72, 76, 90, 96, 98, 105, 140, 152		26, 67, 90, 96, 98, 140
 SG 4	26, 72, 74, 76, 77, 81, 90, 91, 98, 140, 144, 152, 172		4, 26, 77, 81, 87, 90, 98, 140, 172
 SG 5	26, 72, 88, 98, 152		26, 98
 SG 6	26, 76, 81, 90, 91, 98, 152		4, 26, 81, 90, 98
 SG 7	1, 26, 36, 67, 72, 74, 76, 81, 88, 90, 91, 96, 98, 105, 127, 140, 144, 152, 163, 165, 172	127, 163	1, 26, 67, 81, 90, 96, 98, 127, 140, 163, 165, 172
 SG 8	26, 112, 127	112, 118, 123, 127	26, 112, 127
 SG 9	1, 26, 36, 72, 74, 81, 90, 98, 105, 140, 144, 152, 172		1, 26, 81, 90, 98, 140, 172
 SG 10	1, 96, 140, 163, 165, 172	163	1, 4, 87, 96, 140, 163, 165, 170, 172

	PIA 4	PIA 5	PIA 6
 SG 1	1, 4, 26, 67, 72, 77, 90, 105	1, 4, 26, 67, 72, 77, 105	1, 26, 36, 67, 72, 77, 105
 SG 2	1, 4, 26, 44, 67, 72, 74, 76, 77, 81, 87, 90, 92, 96, 98, 105, 140, 144, 152, 163	1, 4, 26, 44, 67, 72, 74, 76, 77, 81, 87, 96, 98, 105, 140, 144, 152, 163, 172	1, 26, 36, 44, 67, 72, 74, 76, 77, 81, 96, 98, 105, 140, 144, 152, 163, 172
 SG 3	26, 67, 72, 76, 90, 96, 98, 105, 140, 152	26, 67, 72, 76, 96, 98, 105, 140, 152	26, 36, 67, 72, 76, 96, 98, 105, 140, 152
 SG 4	4, 26, 72, 74, 76, 77, 81, 87, 90, 98, 140, 144, 152	4, 26, 72, 74, 76, 77, 81, 87, 91, 98, 140, 144, 152, 172	26, 72, 74, 76, 77, 81, 98, 140, 144, 152, 172
 SG 5	26, 72, 98, 152	26, 72, 98, 152	26, 72, 98, 152
 SG 6	4, 26, 76, 81, 90, 92, 98, 152	4, 26, 76, 81, 91, 98, 152	26, 76, 81, 98, 152
 SG 7	1, 26, 67, 72, 74, 76, 81, 90, 96, 98, 105, 140, 144, 152, 163	1, 26, 67, 72, 74, 76, 81, 91, 96, 98, 105, 140, 144, 152, 163, 172	1, 26, 36, 67, 72, 74, 76, 81, 96, 98, 105, 127, 140, 144, 152, 163, 172
 SG 8	26	26	26, 127
 SG 9	1, 26, 72, 74, 81, 90, 98, 105, 140, 144, 152	1, 26, 72, 74, 81, 98, 105, 140, 144, 152, 172	1, 26, 36, 72, 74, 81, 98, 105, 140, 144, 152, 172
 SG 10	1, 4, 87, 96, 140, 163	1, 4, 87, 96, 140, 163, 172	1, 96, 140, 163, 172

	PIA 7	PIA 8	PIA 9
 SG 1	26, 36, 67, 72, 105	4, 26, 67, 72	26, 36, 67, 72
 SG 2	26, 36, 44, 67, 72, 96, 98, 105, 140, 152, 163	4, 26, 44, 67, 72, 92, 98, 163	26, 36, 44, 67, 72, 74, 96, 98, 152, 163
 SG 3	26, 36, 67, 72, 96, 98, 105, 140, 152	26, 67, 72, 98	26, 36, 67, 72, 96, 98, 152
 SG 4	26, 72, 98, 140, 152	4, 26, 72, 98	26, 72, 74, 98, 152
 SG 5	26, 72, 98, 152	26, 72, 98	26, 72, 98, 152
 SG 6	26, 98, 152	4, 26, 92, 98	26, 98, 152
 SG 7	26, 36, 67, 72, 96, 98, 105, 140, 152, 163	26, 67, 72, 98, 127, 163	26, 36, 67, 72, 74, 96, 98, 152, 163
 SG 8	26	26, 123, 127	26
 SG 9	26, 36, 72, 98, 105, 140, 152	26, 72, 98	26, 36, 72, 74, 98, 152
 SG 10	96, 140, 163	4, 163	96, 163, 170

	PIA 10	PIA 11	PIA 12
 SG 1	26, 36, 67, 72, 77, 105	1, 4, 26, 36, 72	1, 26, 36, 67, 72, 105
 SG 2	26, 36, 44, 67, 72, 74, 76, 77, 81, 98, 105, 152, 163, 172	1, 4, 26, 36, 44, 72, 140, 163	1, 26, 36, 44, 67, 72, 92, 96, 98, 105, 140, 152, 163
 SG 3	26, 36, 67, 72, 76, 98, 105, 152	26, 36, 72, 140	26, 36, 67, 72, 96, 98, 105, 140, 152
 SG 4	26, 72, 74, 76, 77, 81, 98, 152, 172	4, 26, 72, 140	26, 72, 98, 140, 152
 SG 5	26, 72, 98, 152	26, 72	26, 72, 98, 152
 SG 6	26, 76, 81, 98, 152	4, 26	26, 92, 98, 152
 SG 7	26, 36, 67, 72, 74, 76, 81, 98, 105, 152, 163, 172	1, 26, 36, 72, 127, 140, 163	1, 26, 36, 67, 72, 96, 98, 105, 140, 152, 163
 SG 8	26	26, 127	26
 SG 9	26, 36, 72, 74, 81, 98, 105, 152, 172	1, 26, 36, 72, 140	1, 26, 36, 72, 98, 105, 140, 152
 SG 10	163, 172	1, 4, 140, 163	1, 96, 140, 163

PIA 13	
 SG 1	
 SG 2	87, 172
 SG 3	
 SG 4	87, 172
 SG 5	
 SG 6	
 SG 7	172
 SG 8	
 SG 9	172
 SG 10	87, 170, 172

Legend

SG1 - Fight Climate Change and Pollution and Protect and Restore Ecosystems

SG2 - Foster Employment and a Circular and Sustainable Blue Economy

SG3 - Decarbonise the Economy and Promote Renewable Energies and Energy Autonomy

SG4 - Invest in Guaranteeing Sustainability and Food Security

SG5 - Facilitate Water Access & Supply

SG6 - Promote Health and Wellbeing

SG7 - Stimulate Scientific Knowledge, Technological Development and Blue Innovation

SG8 - Improve Education, Qualification, Culture and Ocean Literacy

SG9 - Incentivize Reindustrialization and Productive Capacity and Ocean Digitalization

SG10 - Ensure Safety, Sovereignty, Cooperation and Governance

PIA1 - Science and Innovation

PIA2 - Education, Qualification, Culture and Ocean Literacy

PIA3 - Biodiversity and Marine Protected Areas

PIA4 - Bioeconomy and Blue Biotech

PIA5 - Fisheries, Aquaculture, Processing and Commerce

PIA6 - Robotics and Digital Technologies

PIA7 - Renewable Ocean Energy

PIA8 - Tourism, Recreational Boating and Sports

PIA9 - Ports, Maritime Transport, Logistics and Communications

PIA10 - Shipyards, Shipbuilding and Ship Repair

PIA11 - Coastal Management, Construction and Infrastructures

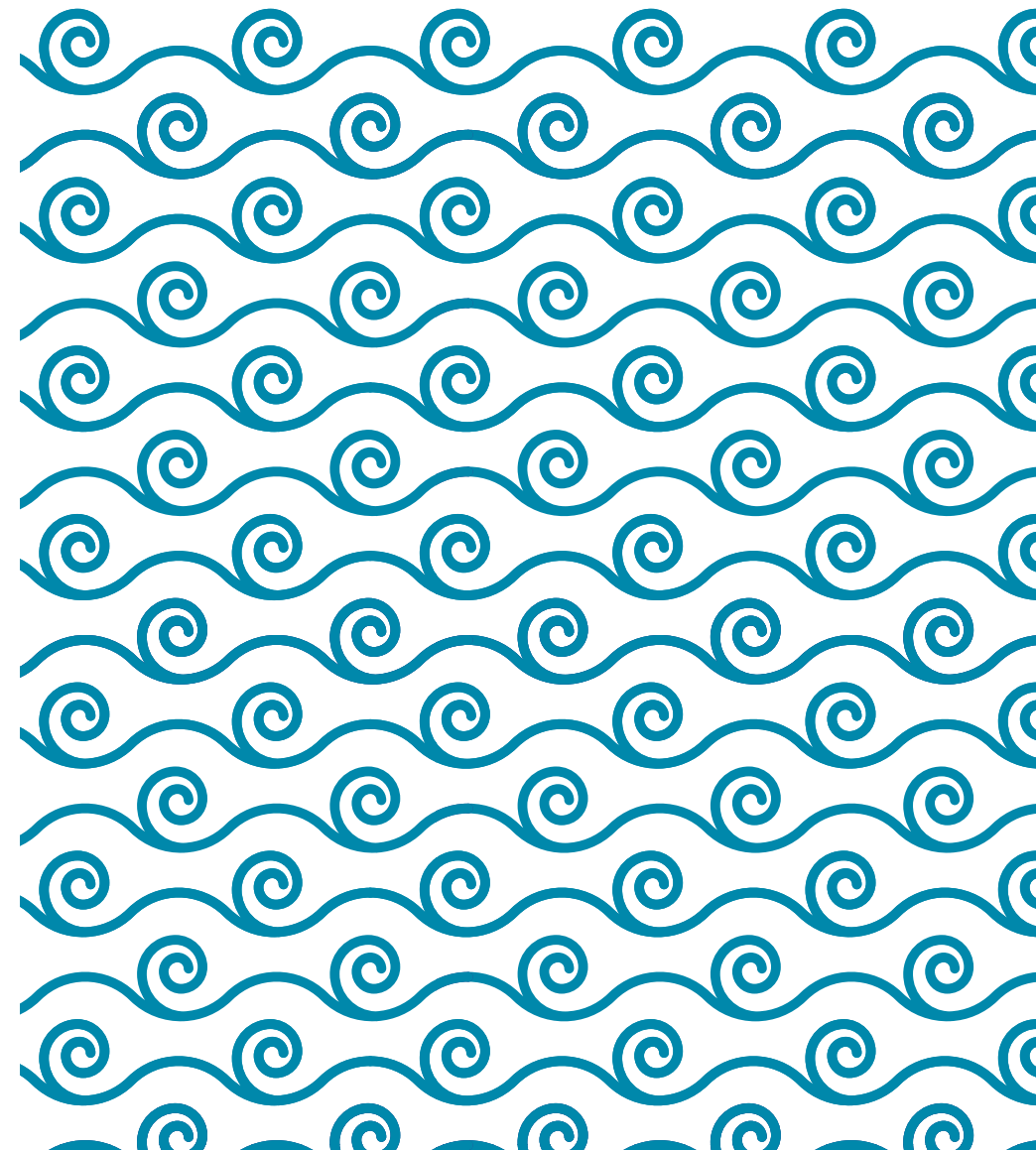
PIA12 - Non-living Resources

PIA13 - Maritime Security, Defence and Surveillance

 **Annexes**

Annex I – General Infographic of the National Ocean Strategy 2021-2030

Annex II – Infographics of the 10 Strategic Goals for the Decade





VISION

Promoting healthy oceans in order to maximize sustainable blue development and the well-being of Portuguese people, setting Portugal as a leader in science-based ocean governance.

10 STRATEGIC GOALS FOR THE DECADE

- ▼ SG1 Fight Climate Change and Pollution, Restore Ecosystems
- ▶ SG2 Foster Employment and a Circular and Sustainable Blue Economy
- ▲ SG3 Decarbonization, Renewable Energies and Energy Autonomy
- ◀ SG4 Food Security and Sustainability
- ◆ SG5 Water Access & Supply
- ▲ SG6 Health and Wellbeing
- ◆ SG7 Scientific Knowledge, Technological Development and Blue Innovation
- ▶ SG8 Education, Qualification, Culture and Ocean Literacy
- ▲ SG9 Reindustrialization, Productive Capacity and Ocean Digitalization
- ◀ SG10 Safety, Sovereignty, Cooperation and Governance

13 PRIORITY INTERVENTION AREAS




- PIA1 Science and Innovation
- PIA2 Education, Qualification, Culture and Ocean Literacy
- PIA3 Biodiversity and Marine Protected Areas
- PIA4 Bioeconomy and Blue Biotech
- PIA5 Fisheries, Aquaculture, Processing and Commerce
- PIA6 Robotics and Digital Technologies
- PIA7 Renewable Ocean Energy
- PIA8 Tourism, Recreational Boating and Sports
- PIA9 Ports, Maritime Transport, Logistics and Communications
- PIA10 Shipyards, Shipbuilding and Ship Repair
- PIA11 Coastal Management, Construction and Infrastructures
- PIA12 Non-Living Resources
- PIA13 Maritime Security, Defence and Surveillance



STRATEGIC GOAL 1 Fight Climate Change and Pollution and Protect and Restore Ecosystems

Portugal must face climate changes, environmental protection, and biodiversity conservation as key challenges for the future. This recognition involves investing in science and technological solutions which will allow preventing impacts on ecosystems and developing regenerative solutions.

Targets

-  To ensure that 100% of the maritime space under Portuguese sovereignty and/or jurisdiction is given Good Environmental Status
-  To classify 30% of national maritime area as protected by 2030, approving the respective management and conservation plans, and to ensure that 1/3 is strictly protected
-  To ensure that 100% of plastic packaging marketed in Portugal is reusable or recyclable







#ClimateChange #MarineProtectedAreas #Biodiversity #Conservation
#MarineEcosystems #CoastalPollution #MarinePollution #EnvironmentalProtection
#Restoration #Technology



STRATEGIC GOAL 2 Foster Employment and a Circular and Sustainable Blue Economy

The development of a circular, inclusive, equitable and sustainable Blue Economy is one of the major goals of the decade. An economy capable of maintaining and creating jobs where the principles of reduction, replacement, reuse, recycling and reprocess of primary resources are the new normal.

Targets

-  To increase Gross Value Added (GVA) of the ocean economy by 30% by 2030
-  To increase the rate of the ocean economy to 7% of GVA of the national economy
-  To double the number of financing instruments dedicated to blue economy projects (for example, sustainable financing, crowdfunding, venture capital)
-  To ensure that 100% of commercial and fishing ports and marinas have environmental management systems for water, wastewater, waste, and power
-  To increase jobs in domestic blue economy by 30% by 2030
-  To ensure average salaries in the ocean economy 8% above the national average

#Bioeconomics #Biotechnology #BlueGrowth #BlueEconomy
#CircularEconomy #BlueEmployment #GreenShipping #Inclusivity
#Equity #Sustainability



STRATEGIC GOAL 3 Decarbonise the Economy and Promote Renewable Energies and Energy Autonomy

Carbon neutrality is one of the country's major challenges for the coming years. With a focus on ocean-based renewable energies, favouring blue carbon, and encouraging processes with a lower carbon footprint, the Sea can make a crucial contribution to this objective.

Targets



To reach at least, 370 MW installed capacity to generate power from oceanic renewable sources



To ensure a 17% cut in greenhouse gases emissions from the ocean economy, as compared to 2005, in line with Portugal's commitment to the Effort Sharing Regulation for 2030 for sectors outside the EU ETS

#2030Agenda #EnergyAutonomy #BlueCarbon #Decarbonization #EnergyEfficiency
#OceanRenewableEnergies #GreenShipping #CarbonNeutrality #Sustainability
#EnergyTransition



STRATEGIC GOAL 4 Invest in Guaranteeing Sustainability and Food Security

Sustainable and sustained food results from the sustainable exploitation of living marine resources, from the development of aquaculture and from zero waste in processing. It is important to monitor pollutants, combat fraudulent swap of species and seek greater autonomy in supplying the food chain.

Targets



To increase national aquaculture production to 25,000 t/year



To increase to 7% the quota of exports of sea products in the total national exports



To keep 100% of fishing stocks within sustainable biological limits, following the parameters from the scientific assessment (i.e. ICES), adjusting the limits of the fishing effort to those levels

#Food #Aquiculture #Biotechnology #ZeroWaste #FoodSafety
#TransformationIndustry #SustainableFishing #MolecularTraceability
#Sustainability #FishValorization



STRATEGIC GOAL 5 Facilitate Water Access & Supply

The diverse growing consumption of water places a great stress on global water resources. In Portugal, with scenarios of prolonged drought, this pressure can aggravate, and it is essential to look for alternative sources of water and promote its efficient use.

Targets



To double the number of desalination units to supply freshwater on a national level

#2030Agenda #DrinkingWater #ClimateChange #Desalination
#SustainableDevelopment #SDG6 #PlanningCoastalZone #NationalWaterPlan
#Sanitation #EfficientWaterUse



STRATEGIC GOAL 6 Promote Health and Wellbeing

From marine ecosystems that provide oxygen and trap carbon dioxide, through food and recreational opportunities, to the bioactive substances of marine organisms used in pharmaceuticals and beyond, the Ocean is closely linked to human health.

Targets



To increase the number of health and well-being tourism projects linked to the therapeutic qualities of the ocean



To double the number of participants in water sports






#HealthyDiet #Wellness #BlueBioTechnology #NauticalSports
#Pharmaceutical #QualityOfLife #HumanHealth #OceanHealth
#CoastalTourism #HealthTourism



STRATEGIC GOAL 7 Stimulate Scientific Knowledge, Technological Development and Blue Innovation

The production of scientific knowledge in support of public policies of the Sea should be a priority. It is important to retain and attract talent and investment to Portugal and enhance our science internationally, promoting collaborative environments with potential for innovation.

Targets

-  To double the number of blue economy start-ups as well as the number of innovative blue projects financed by operational programmes
-  To increase the number of MSc and PhD degrees in ocean-linked scientific areas by 50%
-  To increase by 60% the number of ocean-linked infrastructures in the National Roadmap for Strategic Interest Research Infrastructures (RNIE)
-  To increase the number of days at sea of oceanic research vessels by 30%
-  To double the number of national IPR applications (patents, brands, and design), in ocean and ocean-affiliated technologies (technology, industrial, empowerment)

#Training #CitizenScience #SeaSciences #InternationalCooperation #Industry
#BlueInnovation #OceanObservation #ContinentalShelf #MarineResources
#OceanicTechnology



STRATEGIC GOAL 8 Improve Education, Qualification, Culture and Ocean Literacy

The next decade should contribute to Portugal reinforcing its commitment to Ocean Literacy and improving its educational and training offer for all areas linked to the Sea. Entrepreneurship, innovation, specialization, job mobility and new skills should be encouraged.

Targets

-  To increase European financing for professional training in ocean economy, promoting the participation of women and girls
-  To double the number of workers in ocean-related activities with post-secondary education through level 5 of the National Qualifications Framework - QNQ, under the National Qualifications System - NQS, developed by entities trained under the NQS, as well as Higher Education courses of level 6, 7, and 8 of the QNQ and Professional Technical Courses, also developed by higher level institutions, but that currently lack the qualification degree or level
-  To double the number of young people and adults trained with double certification in the sectors and activities linked to ocean economy
-  To ensure that 20% of Ciência Viva Clubs at school include in their activities plans an exploration of the topic "ocean"
-  To ensure an increase of 10% in the number of Sports Training Centres within the School Sports Programme (Water Sports) and the number of Group Teams of School Sports in water sports (Canoeing, Surfing, Sailing, and Rowing)
-  To increase financing for the surveying, monitoring, and recovery of coastal heritage integrated into cultural landscapes
-  To increase the number of classified nautical and underwater cultural heritage buildings by 20%


#Culture #NauticalSports #Entrepreneurship #Education #Training
#OceanLiteracy #NewProfessions #UnderwaterHeritage
#SeaProfessions #Qualification



STRATEGIC GOAL 9 Incentivize Reindustrialization and Productive Capacity and Ocean Digitalization

In both traditional and emerging sectors, the sea economy must play a decisive role in the country's reindustrialization, based on an inclusive and efficient modern logic, integrating R&D, respecting environmental criteria, and based on a circular economy.

Targets

-  To increase the value of industrial production of emerging sectors in the ocean economy by 20%
-  To increase the financial support provided to innovation, transfer of technology, and diversification of production models in the traditional sectors of ocean economy by 20%

#ProductiveCapacity #Clustering #Digitization #CircularEconomy
#SeaEconomy #ProductiveEfficiency #DigitalEra #R&D #Industry
#Reindustrialization



STRATEGIC GOAL 10 Ensure Safety, Sovereignty, Cooperation and Governance

Due to its Atlantic and European dimensions, Portugal must promote the implementation of an Integrated Maritime Policy in all aspects, consolidating international cooperation, guaranteeing sovereignty in its maritime area, and security in areas of national and international interest.

Targets

-  To ensure the UN adopts the global agreement for conservation and sustainable use of marine biodiversity in areas beyond Portuguese jurisdiction
-  To finish the process for the extension of the Portuguese continental shelf
-  To fully activate the planning and management of the national maritime space

#Atlantic #Cooperation #ContinentalShelfExtencion #Governance #Monitoring
#AtlanticObservatory #MarineSpatialPlanning #IntegratedMaritimePolicy
#MaritimeSecurity #Sovereignty

