



IAPH 2021

SUSTAINABILITY  
AWARDS

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Climate & Energy

# GREEN BAY VIGO Project

**PREPARED AND PRESENTED BY**

PORT AUTHORITY OF VIGO  
ACLUNAGA

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# PORT OF VIGO

## BLUE GROWTH STRATEGY

The Port of Vigo is deeply committed to achieving a balance between port activities and the preservation of good environmental status that's why it has pioneered in the European Union to design and implement its Blue Growth strategy as a collective effort by all the port's users and given its position as a hub of knowledge with high capacity to promote growth based on cross-cutting sectors, institutions and specialisations. Its strategy is aligned with several international commitments and agendas as The New European Green Deal, The Sustainable Development Goals or Our Ocean Commitment which contributes to be an international reference Port in environment sustainable practices.

Its Blue Growth objectives are grouped in four priority areas: innovative, connected, inclusive and green port. The "green" objective of the Port is an integral programme that includes environmental actions and considers social inclusion. Participatory activities with citizens are being developed in order to grow up awareness about the environment protection. In short, the "green goal" is focused on improving the quality life of citizens who live in a city with a Port, as the case of Vigo. The Port of Vigo seeks to improve the competitiveness of the maritime-port sector, but also to boost the local economy and to generate social prosperity, while working to conserve and protect the environment at the same time.

### BLUE GROWTH VIGO OBJECTIVES



Contribution of Blue Growth Port of Vigo to Sustainable Development Goals

# BLUE GROWTH STRATEGY AND THE GREEN DEAL

The port of Vigo works to become the green port of reference in the south Europe, through actions and projects enforced to recover zones where the industrial and urban activity has left his footprint. To do this, it works on direct measures that improve the health of ecosystems, but also on other initiatives linked to the transition to a green, cleaner and more efficient (smart) energy consumption and implementing more environmental-friendly process. These actions are part of the 2030 Zero Emissions Strategy of the Port of Vigo and they are directly aligned with the objectives of the Green Deal, especially in relation to climate change and the improvement of the environment. The Green Port objective embraces goals and projects for the fight against climate change in the Port of Vigo, based mainly on two strategic lines: compensation and mitigation and the reduction of emissions.

In line with the reduction of emissions, the strategy of the Port of Vigo is based on the installation of renewable energies to supply electricity to the port facilities, the improvement of energy efficiency and the use of alternative energy sources

such as LNG or Hydrogen. To do this, it addresses a major transformation and energy transition of maritime transport and logistics, through the development of technologies for propulsive electrical equipment and battery energy storage that reduce emissions in the maritime sector. The expected effects and results will be:

- Development of eco-friendly ships (100% electric / hybrid / with hydrogen fuel cells)
- Development of energy generation, storage, recharging and management systems: solar, tidal, and wind power generation; new energy sources such as LNG or Hydrogen; energy storage systems in battery packs and in hydrogen tanks.
- Development of sustainable mobility (urban interconnection of the Vigo Bay): electric vehicles for people mobility and electric and hydrogen vehicles for goods transport.
- Development of electrification systems: implementation of port charging infrastructure.
- Electrification of maritime mobility in the Vigo Bay

**TOWARDS AN ECOFRIENDLY PORT**  
Designing a sustainable Ro-Ro Terminal

*A port-city integration project based on :*

- LOW EMISSIONS**
  - E1. Auto-sustained OPS system through renewable energy
  - E2. Wind farm of 100 KWh for the car storage consumption
  - E3. Photovoltaic park of 100 kWh for buildings and harbour station consumption
  - E4. Zero-emissions mobility (marine vessels & ground vehicles) using fuel cells and electric engines
- CARBON-NEUTRALITY**
  - C1. Green energy through hydrogenators and renewable sources (photovoltaic and wind blades)
  - C2. Carbon-emissions assessment, in order to quantify the impact and identify improvement measures
  - C3. Carbon offset actions in PLISAN and in Peiraos do Solpor
- GREEN AWARENESS**
  - G1. Thermal comfort of users through customizable and highly efficient systems
  - G2. Use of natural raw materials (sea shells, biomass,...) for high-value applications and visible facilities
  - G3. Ludic activities and dissemination of green actions to increase the environmental awareness of citizens.
  - G4. Improvement of ecosystem services and ecological connectivity in the service area port

Promotion of an Environmental Protected Area in the Port

Peiraos do Solpor

Icons: Wind turbine, solar panel, hydrogen fuel cell, electric plug, and a ship.

## Projects aligned with the emissions reduction and the Green Deal

- Green Motorway of the Seas: implementation of an LNG supply service to reduce greenhouse gas emissions derived from port activity.
  - Suardiaz Vigo Terminal decarbonization: the project defines the replacement of tractor units with new technologies (powered by LNG or Hydrogen) that will reduce the externalities of goods transport, the construction of the SMALL SCALE-LNG HUB terminal, the installation of photovoltaic panels for the supply of the terminal and the implementation of recharging points for sustainable mobility vehicles.
  - Construction of 2 RoRo LNG ships: the project defines the decarbonization of two ships that connect the north of Spain with the west of France (Motorway of the Seas). These boats will be equipped with hybrid battery technology that will improve fuel efficiency, achieving a reduction in greenhouse gas emissions.
  - Construction of three new Class A car carriers: equipped with dual-fuel LNG engines and a battery pack to be self-sufficient in port. They will have a storage capacity of 700 m<sup>3</sup> of LNG, operating weekly between Vigo and northern Europe.
- OPS Onshore Power Supply: connection of ships to the terrestrial networks during their stay in port to reduce the emission of nitrogen and sulfur oxides.
- Green Bay Vigo - electrification of maritime mobility in the Vigo Bay: development of a new electrical propulsive systems to transform the maritime mobility in the Vigo Bay and to minimize its environmental impact.



# GREEN BAY VIGO

## PROJECT DESCRIPTION

Green Bay, project presented by Port of Vigo together with Blue Growth stakeholders like ACLU-NAGA, aims to achieve the transition towards sustainable maritime and port mobility, which is respectful with the environment and with the urban centres where ports are normally located, thanks to the participation and transfer of knowledge between two of the most important sectors of Galicia, the naval sector and the automotive sector, since this project will be developed by a public-private consortium of companies from both sectors. The main objective of the project is the electrification of maritime mobility in the Vigo Bay through the development of technologies for propulsive electrical equipment and energy storage in batteries that reduce emissions in the maritime sector within this area. All this supported by the deployment of port infrastructures that allow the rapid charging of the batteries installed on board the vessels. This is intended to reduce the carbon footprint and improve the energy sustainability of the Port of Vigo, reducing its energy dependence too.

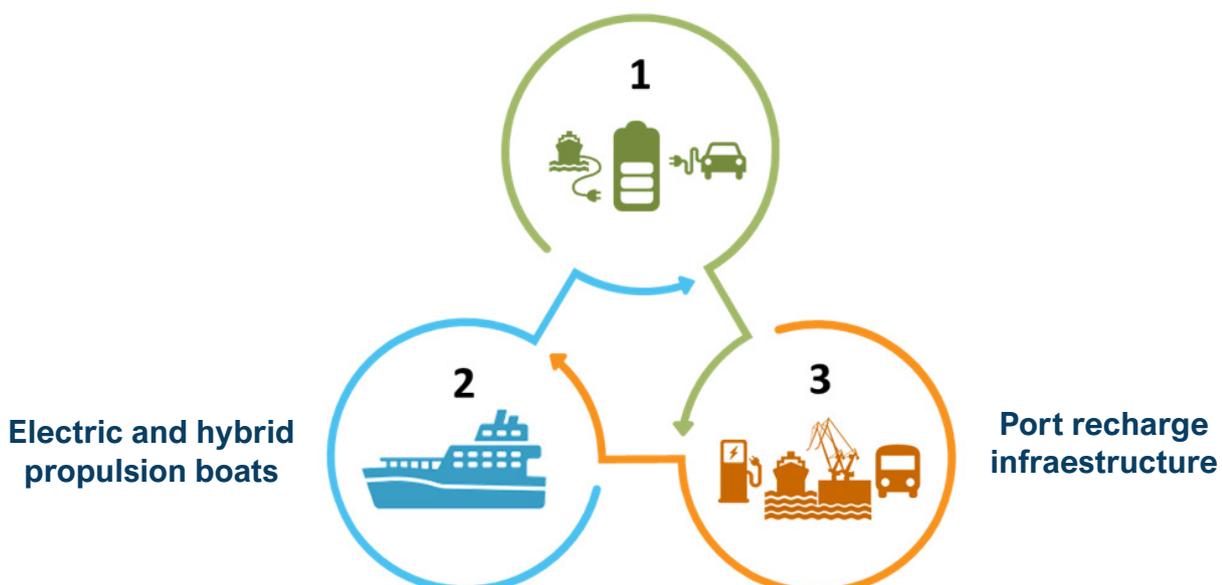
Aligned with the 2030 zero emissions commitment of the Port of Vigo and as a complement to the Green Bay Vigo project, the use of hydrogen technologies will be developed, generation and

storage, as a sustainable solution for the decarbonization of land transport and its application in the maritime sector with the development of hydrogen vehicles for goods transport and vessels with hydrogen fuel cells.

### PROJECT RESULTS

- Hybrid propulsion boats (diesel and batteries) and pure electric with batteries, using the capacities of companies and Galician Technology Centers.
- Advanced shipbuilding technologies for small shipyards to obtain efficient ships to reduce energy needs.
- A prototype of a hybrid and pure electric propulsion package to reduce gas emissions in the port (close to urban centres and the Illas Atlánticas National Park).
- Design and construction of port infrastructures to charge the batteries of the boats. Superchargers and semi-automatic connection systems.
- Guidelines for a regulatory framework that establishes emission-free areas near urban centres and natural areas.
- Development of prototypes boats.

### Propulsion and energy storage systems



Vigo is one of the European cities with the most private shipyards, so it has the knowledge in terms of technological development of vessels with high added value, such as oceanographic research vessels, unique prototypes that incorporate the most advanced technology. In addition, another sector considered a driver for the city, such as the Automotive Industry, which represents 25% of national production, has great experience in technological research and development. Especially with regard to the development of electric batteries, their operation and the infrastructure necessary for charging them. Both sectors, naval and automotive, have technological centres of international reference with wide experience in research and participation in technological development projects.

New environmental regulations, with the creation of controlled emission zones are a reality to which the Shipbuilding and Port Sectors have to adapt. In addition to the creation of new opportunities in terms of lines of work and what it means for a Business Fabric made up mostly of SMEs, the scalability of the model that will be developed to other regions with similar environments to the Ría de Vigo is one of the most attractive features of the project for the city of Vigo. Being a reference in the implementation thereof and a model to be followed by other areas and cities (Stockholm, Amsterdam, Oslo, Copenhagen).



The implementation of this project will not only have an **environmental impact** with the reduction of emissions, the use of renewable energy sources and the reduction of noise pollution, but it will also have an **economic and social impact** thanks to the improvement of the local economy and the recovery of the industry, the creation and promotion of highly qualified employment, the access to new markets for automotive and naval companies, the new possibilities of the tourism sector to offer ecological tourist transport and the development of advanced technologies to improve competitiveness in the sector.

# PROTOTYPE BOATS

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**Passenger transport ferry:** Pure electric with a powerful battery pack and supercharger for port charging.



**Inshore fishing:** Hybrid propulsion. Electric in Emissions Restricted Zones and Diesel out when you need a lot of power or cruising long distances.



**Auxiliary boat for mussel cultivation floating structures:** Pure electric with full charge at night and possible charging with renewable energy in mussel cultivation floating structures.



**Multipurpose boats for port services:** Pure electric with full charge at night or Hybrid.

# PROJECT WORKPLAN

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These project will take 42 months to complete and it will be developed in five stages:

**STAGE 1**

Definition of requirements

**STAGE 2**

Research, development and design

**STAGE 3**

Development of prototypes and port infrastructure

**STAGE 4**

Pilot test

**STAGE 5**

Conclusions, optimization and scalability

# PARTNERSHIPS & COLLABORATIONS

## -PORTS-



## -BUSINESS ASSOCIATIONS-



## -TECHNOLOGY CENTRES-



## -SHIPYARD AND SHIPOWNERS-



## -PRIVATE COMPANIES-



## -PUBLIC ADMINISTRATION-

