

SHIPPING AND BLUE ECONOMY

PORTUGAL AS AN OPPORTUNITY

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Director General for Maritime Policy

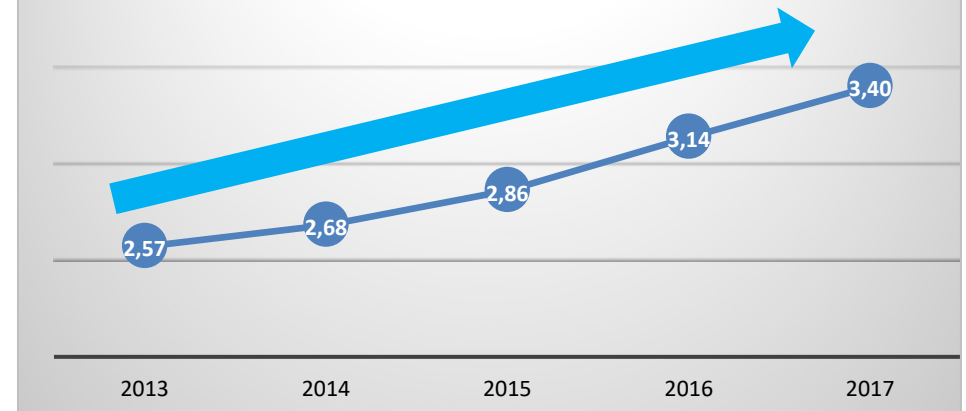


GVA “blue” business (enterprises)
2015: 2,8% of total business in PT
2017: 3,4 % of total business in PT

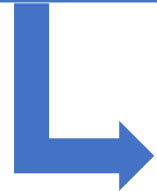
GVA Growth of
36,8%



Peso do VAB Empresas Economia Azul sobre VAB Empresas Economia Nacional (%)



Between 2015-2018



- Exports of “blue” products grew **25%**
- Productivity of blue economy was **17%** higher than the national overall score
- Merchant navy grew **94%** in the number of ships and **269%** in the DWT

Ocean amounts for more than 90% of Portugal's territory....

...which means a lot of room to grow!

Land area: 92.152km² (108th largest country in the world)
 Extent of the coastline: 1859 km (including Azores and Madeira)
 Current EEZ: 1.7727.408km²
 World Ranking: 20th largest
 European Ranking: 6th largest
 95% of portuguese territory is maritime



EEZ+Extended Continental Shelf: 3.897.408 km²
 World ranking: 9th largest
 European ranking: 2nd largest
 97% of portuguese territory is maritime

An area:
 Bigger than India (the 7th largest country in the world)
 Equivalent to Continental EU (except UK and Sweden)



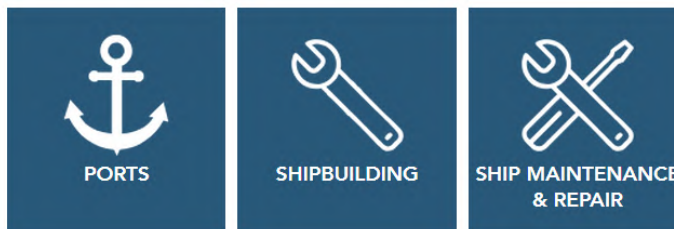
SHIPPING IS KEY FOR BUILDING A SUSTAINABLE BLUE ECONOMY – EXPLORE SINERGIES WITH OTHER BLUE SECTORS




*tonnage tax regime
Armed guards on board
Services Digitalization



SINERGIES



SHIPPING AND BLUE ECONOMY: BUSINESS OPPORTUNITIES

- **Shipping: tonnage tax** 
- **Green Shipping and Maritime LNG**
- **Ocean Renewable Energies**
- **Port Tech Clusters: innovation ecosystems**
- **Bluetech Accelerator – Ports&Shipping 4.0**

Why choose the Portuguese tonnage tax?



Portugal has...

1. Incomparable geo-strategic positioning and, consequently, strengthening, on a large scale, its capacity of assertion and international intervention
2. A predominantly littoral geography and planning, with all of its centres of decision turned towards the Ocean;
3. The only Atlantic capital (Lisboa) of the European space and the archipelagos of the Azores and Madeira extend the EU into the Atlantic space;
4. A long naval tradition and the maritime identity of a people, that again ambitions Portugal in the Ocean
5. An extensive and effective diplomatic network
6. A Navy capable of operating globally

SHIPPING

The Portuguese government has approved a special regime that foresees the Portuguese tonnage tax and scheme to support seafarers that allows:

Benefits:

- Special regime that foresees the Portuguese tonnage tax;
- Seafarers employed on vessels are exempt from personal income tax
- Seafarers employed on vessels are eligible to pay reduced rates of contributions to social security (in total, 6%, being 4,1% borne by the employer and 1.9% by the seafarer)
- Integration of the procedures for registration and dematerialization of the respective acts, running the whole process by electronic means

Goals:

- ✓ Capture external investment
- ✓ Enlarge the Portuguese market of maritime transport
- ✓ Increase the number of ships that fly the Portuguese flag
- ✓ Create employment
- ✓ Increase tax revenues



SHIPPING

Applicable to:

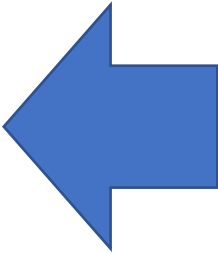
The scheme applies to income from eligible activities carried out through ships that meet the following requirements:

- Fly a flag of a European Member State or a Economic European Area (EEA) state
- Are strategical and commercially managed from a EU or EEA state
- Companies who have registered vessels outside the EU or the EEA may opt for this scheme if, which at least 60% of the respective net tonnage flies a flag of a EU or EEA stage, and the respective commercial and strategical management is run from EU space.

Consequences of the application of Tonnage Tax:

- Enhances competitiveness of ship owners, charterers and ship managers
- Encourages the employment of Portuguese personnel
- Shipping activities in Portugal ensure the implementation of EU acquis on maritime safety on vessels
- Ship owners can opt for a year by year flat taxable profit instead of the conventional profit/loss calculation method

SHIPPING AND BLUE ECONOMY: BUSINESS OPPORTUNITIES

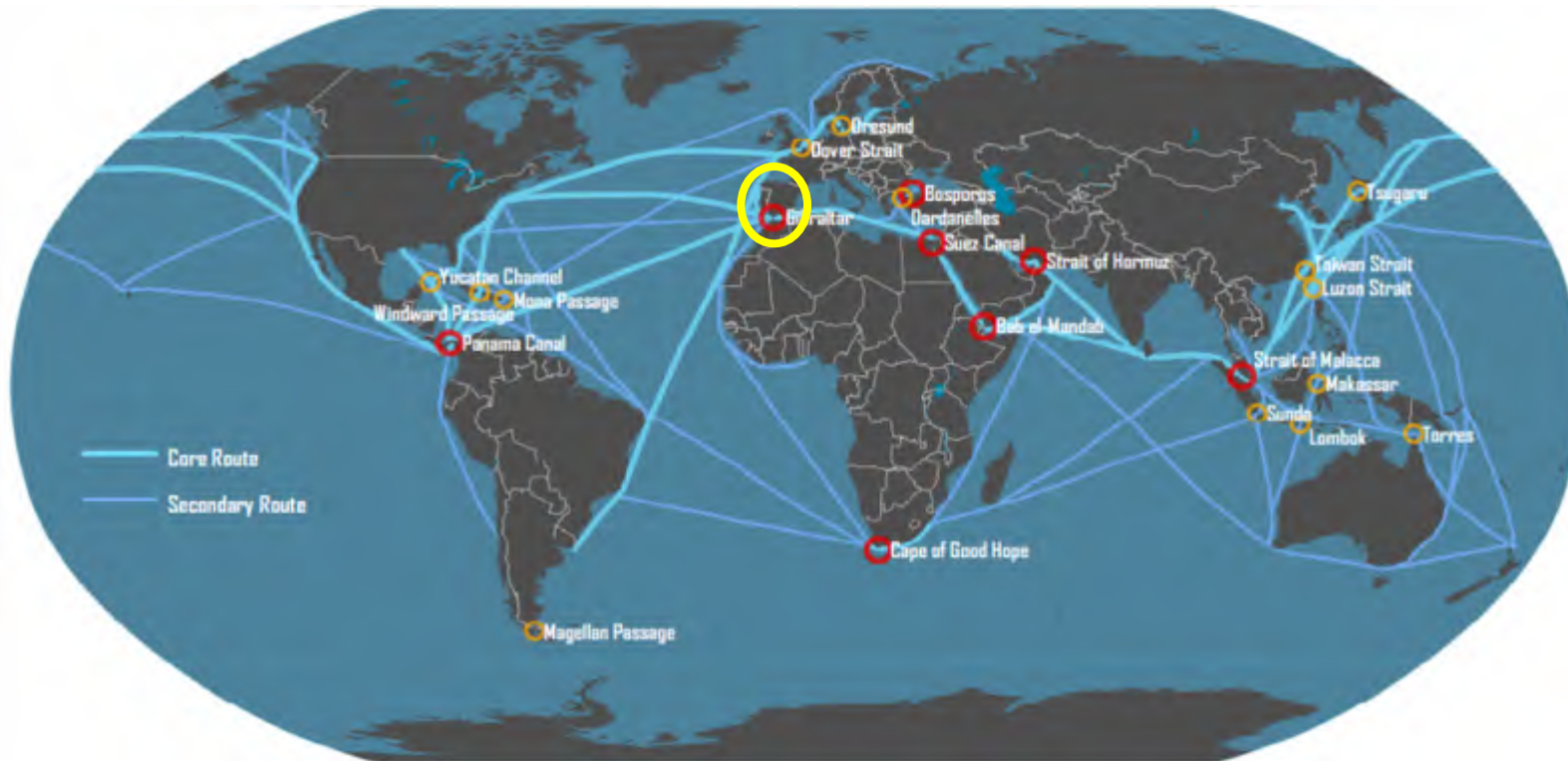
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Business Opportunity 1: The potential of Portugal as a hub for LNG re-exports

Portugal is in the top 3 of US LNG exports for Europe

India, Egypt and Argentina are the main re-export markets

LNG hub in Portugal: a route for a sustainable european energy security



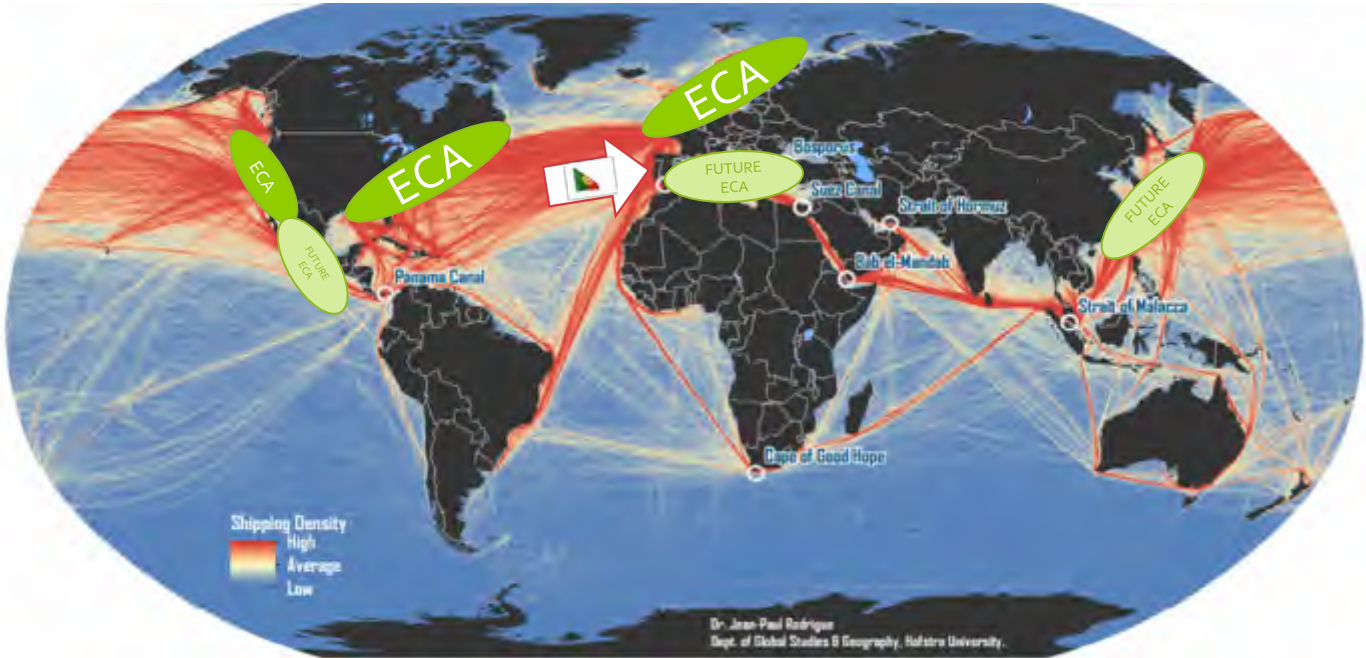
Portugal is located in the middle of the **main core** and **non-core routes of trading in the world**, making it a privileged player in the **Bunkering Business**, for commercial trading, tourism (cruise ships), for both deep-sea and short-sea shipping, enjoying a geographical advantage to bunker the majority of the ships arising from the Suez Canal and the Panamá Canal.

LNG hub in Portugal: a route for a sustainable european energy security



- The coast of Portugal is located in the Atlantic Ocean and this **is not** an emission control area (ECA).
- However the North Sea and Baltic region are already ECA zones and there is a possibility that the Mediterranean Sea will become an ECA zone. **In 2020 the global sulphur cap of 0,5% will be effective for all non-ECA zones and deep sea shipping.**

LNG hub in Portugal: a route for a sustainable european energy security



- ECA zones will indirectly affect the Portuguese ports. (Most of the transatlantic traffic moves between ECAs, at least twice a year)
- Those issues are important for short sea traffic partners and for the Portuguese ports.
- The Directive of the European Parliament and of the Council on the deployment of alternative fuels infrastructure indicates that an appropriate number of refueling points for LNG is provided at maritime ports to allow for the circulation of LNG throughout the TEN-T Core Network, according to common technical standards until 2025 for LNG.

LNG hub in Portugal: a route for a sustainable european energy security

LNG Vessel Service Station



Source: Cryostar.com, 2016

LNG Ship-to-Ship Transfer



Source: <http://www.klawlng.com/>, 2016

Source: <http://hhpinsight.com/>, 2016

- Portugal can act as an Atlantic LNG service station for vessels that use this energy source, using Sines port complemented with LNG Floating Bunkering units and/or ship-to-ship transfer solutions
- This would reinforce the role of the Atlantic as a secure energy corridor for Europe, as well as reinvigorate the shipbuilding and naval industry.

Business Opportunity 3: The potential of Portugal for small-scale LNG hub

First regular LNG Small-Scale ocean virtual pipeline in the world, 4 years running, 4.300 operations, 33 isocontainers weekly delivered:

LNG Ocean
Virtual Pipeline
Sines-Lisboa-
Madeira:
leading
innovation in
small-scale
logistics and
trading



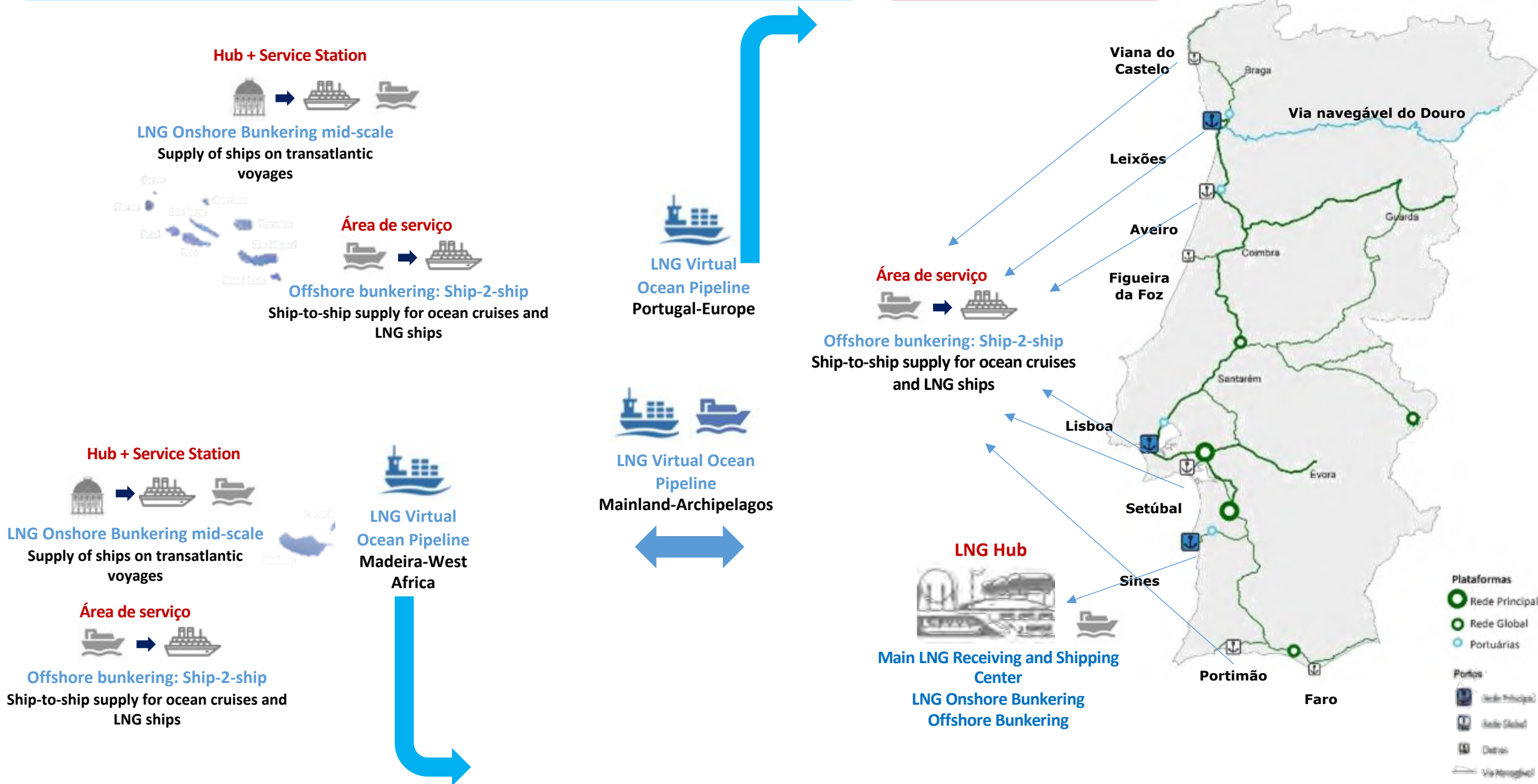
- Almost 400 GWh of power delivered yearly
- LNG isocontainers are transported in a conventional containership, alongside other commodities, cutting LNG shipping costs
- Efficient solution for small scale LNG trading for european and african markets, using Portugal as hub

MARITIME LNG ROADMAP: PORTS BASELINE INFRASTRUCTURES

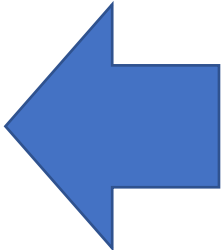
Location and capacities

Total Investment :

130,5M€



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Ocean renewable energies can substitute the total consumption of coal of Portugal's electric energy mix

Decarbonize
and
reinforce
energy
security
with blue
renewables



- **Production of electricity from coal:** 8M bbl/year, emissions ~8Mt CO_{2equiv}

- **Annual coal imports for electricity production:** 18,4M bbl/year

- **Imports costs:** 285M€/year

- **Floating *offshore* wind:** 7,1M bbl /year, without CO₂ emissions

- **More security:** endogenous energy production

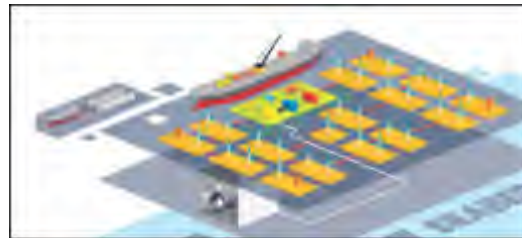
- **More value:** production and maintenance of the equipments by national companies; creation of a new export sector

- **Reduction of 25% of the national energy dependence**

Ocean renewable energies: for a future sustainable energy security



Source: <http://www.sustainablecitiescollective.com/>, 2016



Source: <http://www.hzocean-project.eu/>, 2016



Source: <http://www.boem.gov/>, 2016;
<http://cmheavyindustries.com/>, 2016

- Ocean-based renewable energies, particularly floating offshore wind and wave energy, stand as a second area where the US and Portugal can enhance energy cooperation.
- Floating offshore wind and wave energy are two frontier renewable sources that have immense potential for producing **secure and sustainable electricity, hydrogen / syngas for ship fuel and desalinization of sea water**

Ocean renewable energies: for a future sustainable energy security



Portugal Offshore Wind Resource (potential): 7,1M bbl/year (equal to 25% of national electricity consumption)

In focus:



Windfloat Technology Pilot in Portugal

Developed by a Consortium led by EDP company, it is the most efficient floating wind offshore prototype in the world according to NREL

- In Portugal, floating offshore wind has the potential for supplying 25% of the total consumed electricity, enough to substitute a coal power plant.
- EDP, the main Portuguese utility, is a pioneer in the development of this new technology, as demonstrated by the Windfloat concept prototype.
- In 2017, it will be created a 25 MW floating offshore wind farm in Viana do Castelo for demonstrating a scaling-up of the Windfloat technology.
- In a recent report, US-based National Renewables Energy Laboratory has mentioned Windfloat as one of the most promising technologies of this kind.

Ocean renewable energies



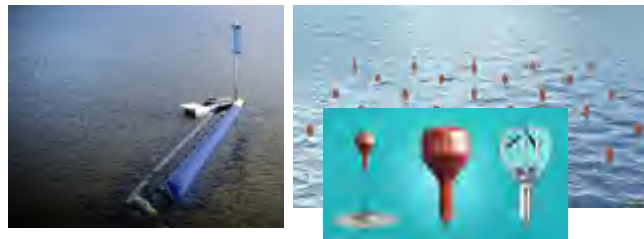
Portugal Wave Resource (potential):
100 bbl per 1m
shoreline (500 km west coast shoreline)

In focus:



Wareroller pilot in Portugal

Developed by a consortium led by AW Energy, a Finnish company, it assured financing from EU for scaling up to a demonstration project, that is going online in the 3T 2016.



New projects coming

Copower, a Swedish company, and Bombora, an Australian technology, are considering Portugal as test lab for their prototypes.

- Wave energy is a more experimental technology—due to its harsh operation environment.
- Still, taking into account its power generating potential, it is worth investing in its development.
- Portugal and Sweden are working together in this area and would gain a lot of in combining resources for generating higher-scale initiatives.

Floating Offshore Wind: high export potential



- Export market is huge, namely in Europe, which represents more than 80% of the global market until 2030 (UK and France).
- In 2013, there were licenced 22 GW *offshore*; in 2030 it is forecasted 65 GW.

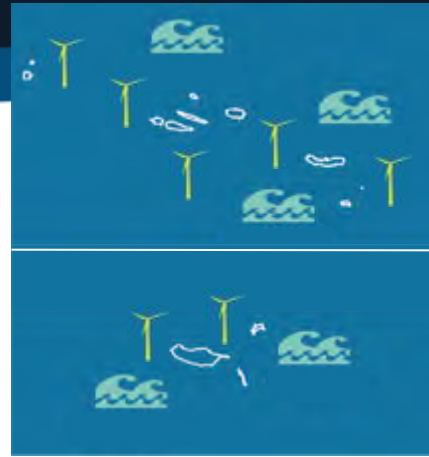


- Market value of 227 billion € (average cost of 3,5 M€ per installed MW)
- The portuguese industry can build the capacity for acquiring a quota of 59 billion euros of this market:



- Towers, components and foundations: 39 billion €
- Blades: 20 billion €
- Equal to a **tenfold increase of present market and employment**

Alternative business models for using ocean renewables



Production of electricity for Islands and isolated territories, for substitution of imported fossil fuels



Water desalination: a high cost and energy intensive process. Ocean renewables can work as a viable solution for islands and water-stressed territories

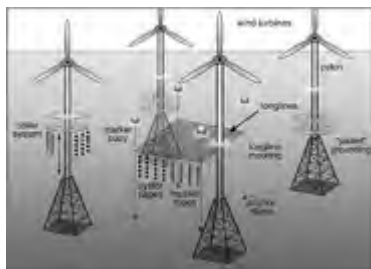
Fonte: www.offshorewindbiz.com



Power-to-gas (P2G): process that stores electricity in the form of syngas or hydrogen for feeding gas network or petrochemical units. Demonstration projects ongoing in Netherlands.

Fonte: www.industrytap.com

Synergies blue+ renewables



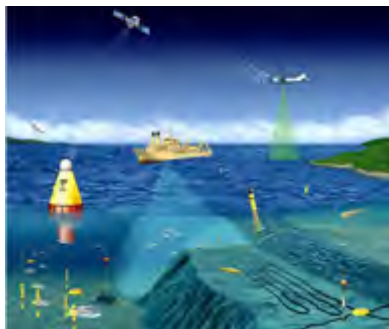
Fonte: Allard. 2009, University of Rhode Island

➔ Offshore Aquaculture



Fonte: www.gizmodo.com

➔ Deep-sea Mining

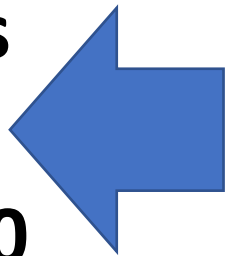


Fonte: celebrating200years.noaa.gov/

➔ Energizing maritime surveillance platforms

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What are they?

How to operationalize?



OCEAN ECONOMY INNOVATION HUBS: ONE OF THE CENTRAL VECTORS OF THE PORTS COMPETITIVENESS STRATEGY 2026

OPEN INNOVATION

PORT TECH CLUSTERS ARE OPERATIONALIZED THROUGH THE BLUETECH ACCELERATOR AND THEIR THEMATIC VERTICALS

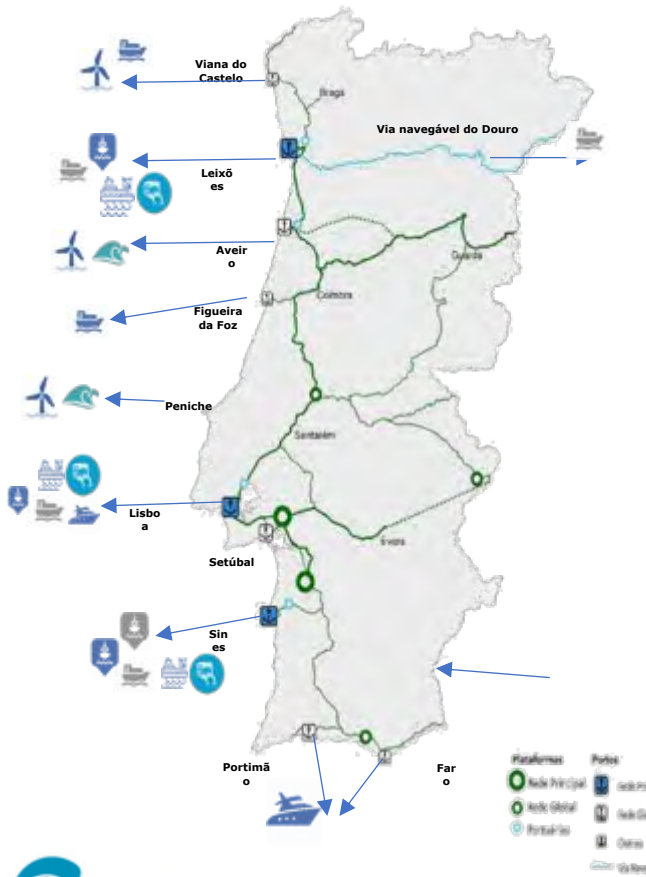


Connect startups, mature companies and science to create integrated ecosystems that accelerate technological and business innovation, operating in the port system and / or with the support of the port system, with privileged and permanent access to the sea

PORTUGAL PORT TECH CLUSTERS

Innovation Accelerators for Ocean Economy Competitiveness

Comercial Ports

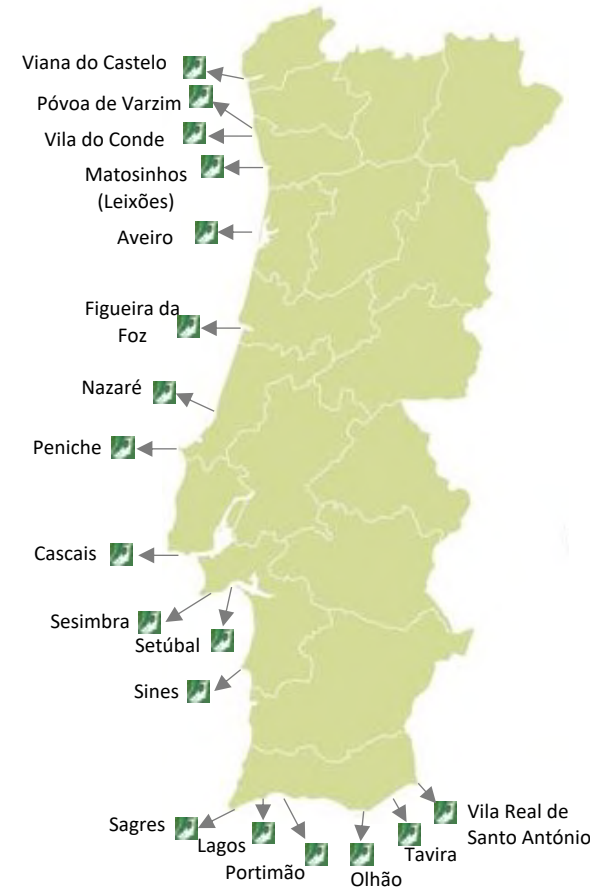


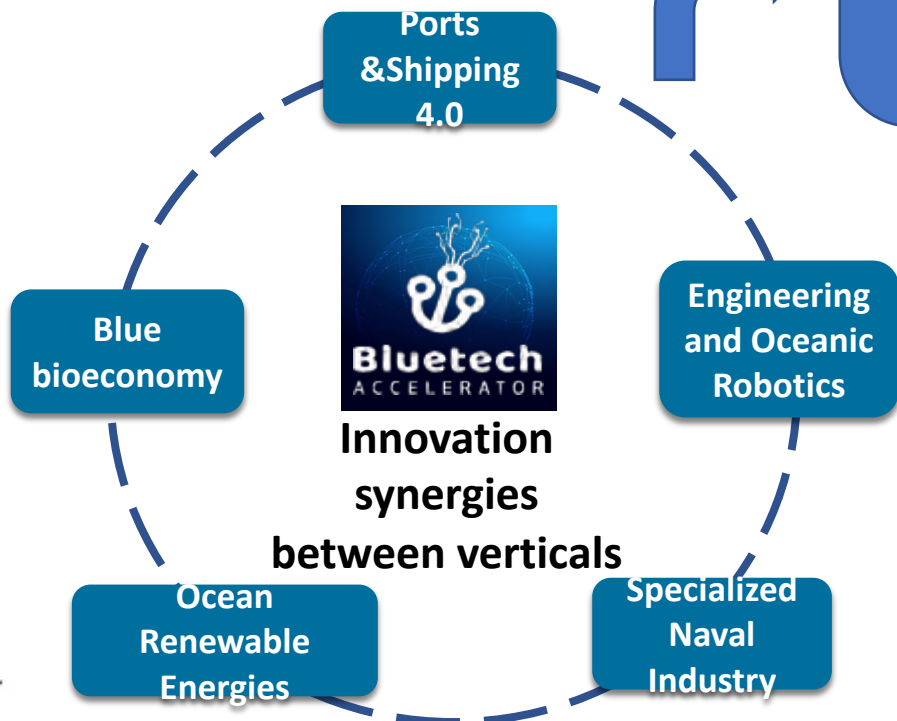
In PT port's administration are all public companies

Specific water access rights and owner of facilities that can lower the costs of context for a wide range of ocean economy activities, namely start-ups and technological/science centres

Front doors for international trade and are linked to the hinterland / value chains

Fishing Ports





1 Anchor each vertical to a group of Bluetech Pioneers (mature companies), which co-finance the accelerator, define the innovation / business needs, and select the startups for the acceleration cycle

2 Following the acceleration cycle, the selected startups are targeted by the vertical's Bluetech Pioneers (mature companies), public funding (Blue Fund, EEA Grants and other mechanisms) and other private investors. They physically settle in the port area of the APDL

3 Repeat a new acceleration cycle. Simultaneously, scaling up and business development of the startups of previous acceleration cycles, with continuous dynamization of their insertion in the international deal-flow of private investors

"DYNAMIC CLUSTERIZATION" OF THE BLUE ECONOMY IN THE NATIONAL PORT SYSTEM, PUSHING THE PRIVATE INVESTMENT

PORT TECH CLUSTERS



Bluetech

ACCELERATOR

Ocean Portugal Start-Up Program



Ports & Shipping 4.0

An initiative of



REPÚBLICA
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MAR

FUNDAÇÃO
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BUILDING
THE INNOVATION
ECOSYSTEM



Fundo Certo para
Política do Mar

PORTS AND SHIPPING 4.0: CREATE A DIGITAL SERVICES CLUSTER FOR SHIPPING OPERATIONS

Key Change Drivers Impacting the Future



Overcapacity
Shipping Ports



Energy Security and Efficiency



The Rise of
Smaller Players



Artificial Intelligence
and Automation
Advancements



Sustainability, eco-efficiency
and low-carbon operations



Quest for Knowledge
and Operational
Excellence



Bluetech
ACCELERATOR

Ocean Portugal Start-Up Program

PORTS&SHIPPING 4.0

THE 4 CHALLENGES

1. Process Optimization in Port Hinterland

includes

The concept of extended gateways, rapid container release operations and efficient land-side intermodal forwarding of loading units.

Data analytics for complete vessel situational awareness and real-time information of all critical ships operations and cargo flow.

Security profiling illicit activity at sea, operational risk assessment and dynamic pricing insurance.

3. Future Shipping Connectivity

includes

Enabling ports and cargo to be "connected and linked".

Ship chartering marketplace allowing shipowners, charterers and operators to choose best freight rates according to a placed position and cargo space availability.

Voyage optimization, situational awareness for the fleet operator, real-time scheduling and environmental compliance.

2. Cargo and Fleet Performance Management

includes

Use of historical data, statistical algorithms and machine learning techniques to avoid port congestions, delays, and other port operational inefficiencies. Use of historical data of vessel geolocation to drive product innovation.

Use of digital twin for ports and vessels allowing ports to create testing scenarios and producing valuable insights from data.

4. Environmental Sustainability

includes

Reducing port environmental footprint and monitoring air, water and noise pollution through smart technologies.



Reducing ship air pollution and, increasing efficiency of ship-generated waste.

Use of air drones and micro-satellites. Environmental compliance through early detection of potential hazards; offshore infrastructure maintenance, reducing downtime, repair needs, and required inspection.

Key Technological Solutions that will be offered by



OUR PIONEERS: THE BLUETECH ACCELERATOR PARTNERS

Shipping




Digital and Robotics

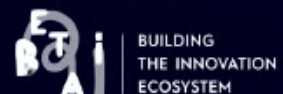



Ports

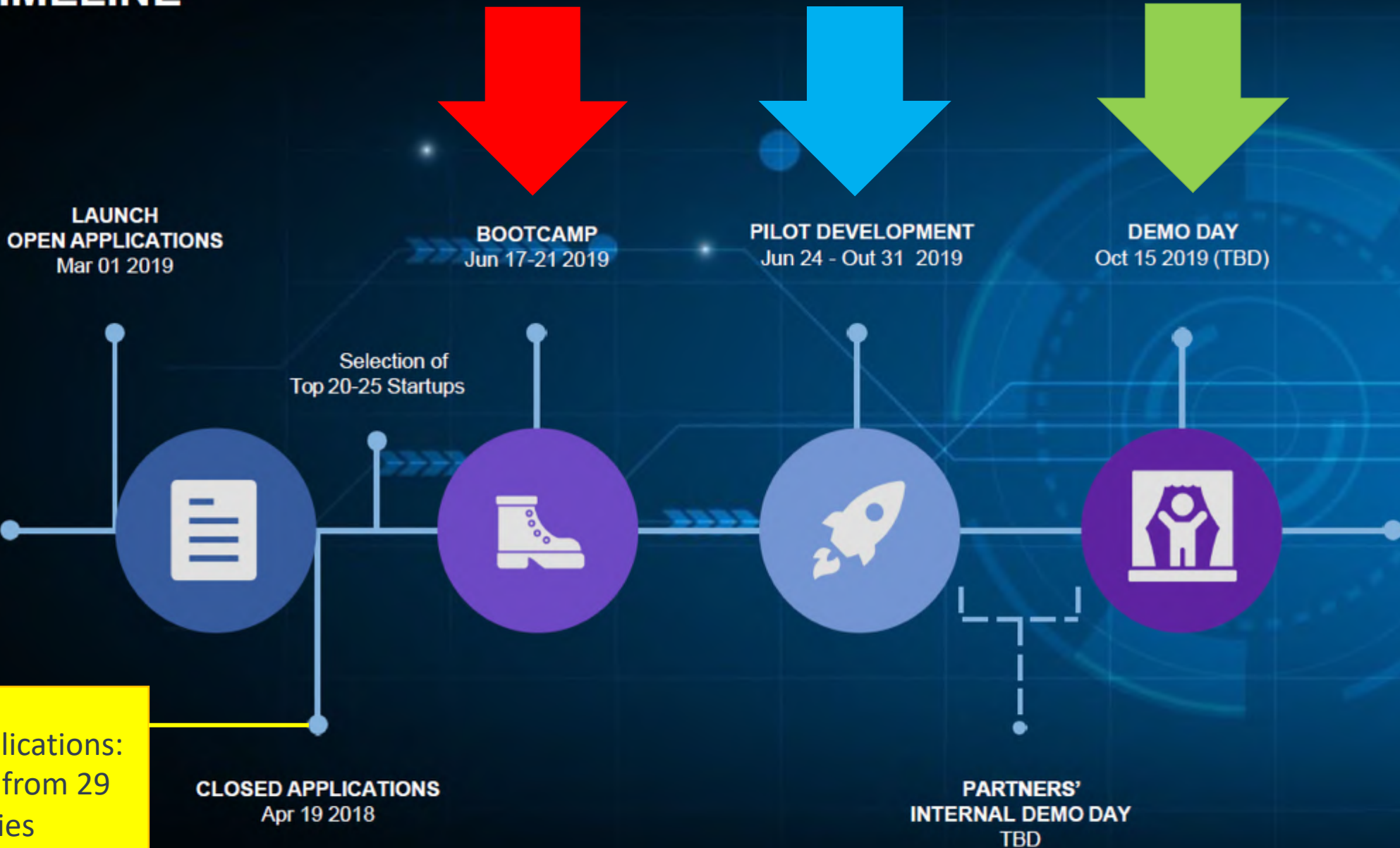
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