# El Port of Barcelona

## Social

500 companies

40,000 jobs

equivalent to 1% of employment in Catalonia

and 3.3% of employment

of Barcelona

## Economic

71 million tonnes of goods moved

Value of the goods:

**€118,142.20 million,**

73 % of Catalonia's maritime foreign trade

## Environmental

### Emissions del Port of Barcelona

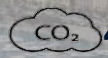
*Source: Barcelona Port Authority*

**14.5 BCN city (2017)**

2.1% BCN province (2022)

1.22% Catalonia (2022)

### GHG Emissions Port of Barcelona



495,000 tn/year

### Energy consumed 2022

**2000 GWh/year**

# 1.1 - The Port of Barcelona at a glance

- Highly diversified
- Well connected
- Culture of innovation
- European focus


By all means of transport:

Inland maritime terminals

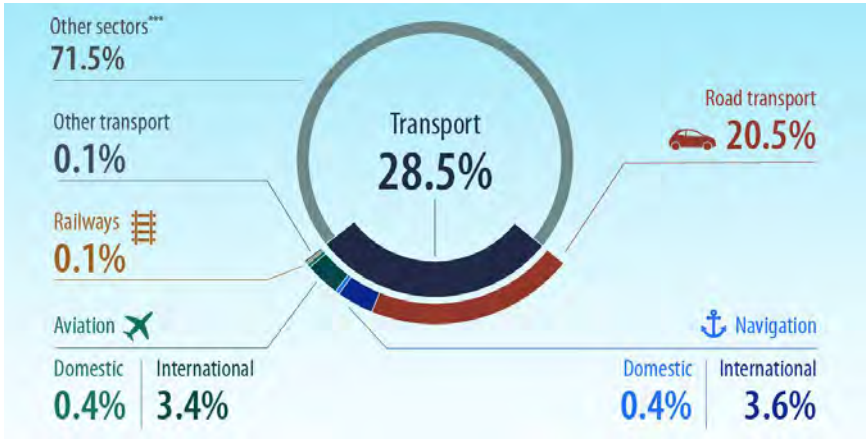


Short Sea Shipping & Highways of the Sea

# 4.1 – Table of contents

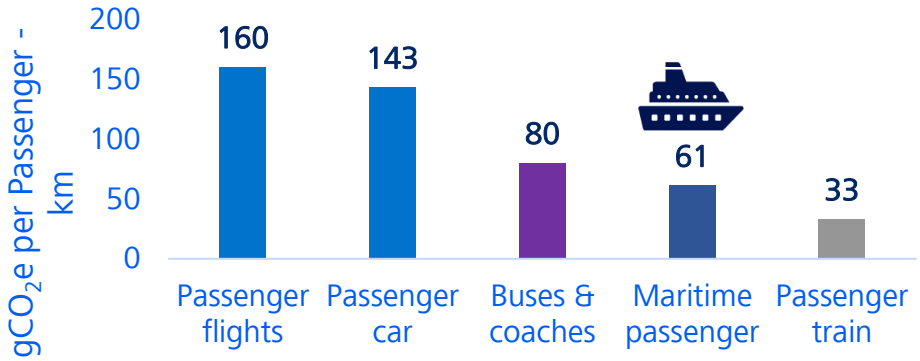
# 1.2 - GHG emissions in the EU

## EU-27 GHG EMISSIONS 2019

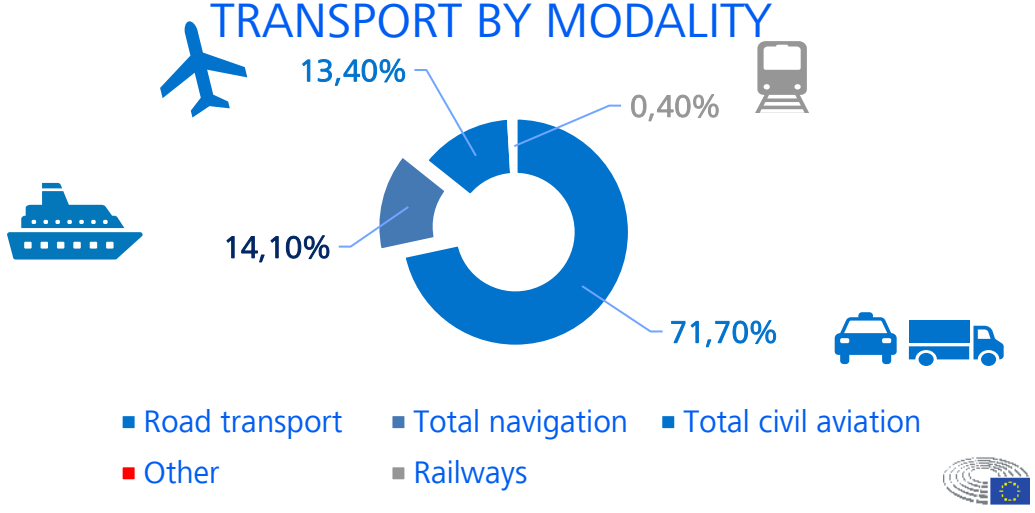



Global shipping accounts for 3% of GHG emissions

## AVERAGE GHG EMISSIONS FOR PASSENGER TRANSPORT IN THE EU-27

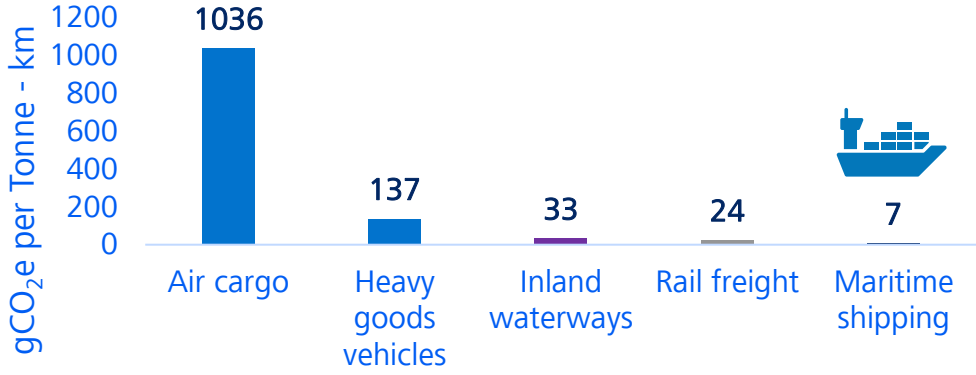



## GHG EMISSIONS FROM EU-27 TRANSPORT BY MODALITY




Source: European Environment Agency 2022

## AVERAGE GHG EMISSIONS FOR FREIGHT TRANSPORT IN THE EU-27




Source: Transport and environment report 2021, EEA, https://www.eea.europa.eu/publications/transport-and-environment-report-2021
The data refers to the 2018.

# 2 - Regulatory context - Climate change

## Port of Barcelona ambition levels

**50% reduction of GHG by 2030 compared to 2017**

Focus on the energy transition to reduce atmospheric pollution and greenhouse effect gases

## United Nations Ambition Levels

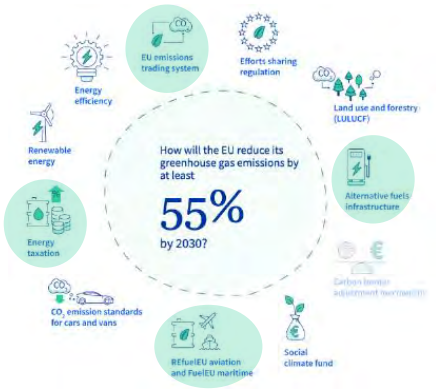
And that **total annual GHG emissions** from international shipping should **be reduced by at least 50% by 2030 compared to 2008.**

## IMO

**40% of GHG in 2030**
**70% of GHG in 2040**
**100% of GHG by 2050**

- Index of Energy Efficiency of Design (EEDI)
- Index of energy efficiency of existing ships (EEXI)
- Plan de gestión de eficiencia energética del barco (SEEMP)
- Sistema de recolección de datos (DCS)
- Carbon intensity indicator (CII)
- Others: SECA Region Mediterráneo (May 2025)

## European Union- Fit for 55 + RePower





## Eu Ambition levels

EU countries must cut greenhouse gas emissions by at least **55% by 2030.** Their goal is to make the EU **climate neutral by 2050.**

## Spain

PniEC Energía y Clima

Plan de Recuperación, Transformación y Resiliencia

Climate Change and Energy Transition Act
Long-term strategy 2050
Equitative Transition Strategy
Hydrogen Roadmap

## Climate Change and Energy Transition Law 7/2021

## Strategic Framework for State Ports

| | | |
|---|---|---|
| Reducción de la huella de $CO_2$ de las Autoridades Portuarias, con respecto a 2019. | 70 % | 2030 |
| Reducción de la huella de $CO_2$ de los puertos, con respecto a 2019. | 50 % | 2030 |

# 3.1 - Global emissions from the port

It has been developed by establishing the Port and not the Port Authority as the subject of the inventory, internalizing the emissions of port activity, thus giving the appropriate weight to emissions from ships and terminals.

## Concessions 139.357

Terminals 44.227 (Updated)

- Containers
- Bulk liquids
- Vehicles
- Bulk Solids
- Cruises and ferries

Logistic 9.058

Port-City 11.271

Industrial 74.800

## Ships 315.619

Anchorage 17.294

Maneuver 50.028

Bitter 232.795

Auxiliary 15.502

## Works 7.155

Materials 4.530

Transport 365

Consumption 2.260

## Land

### Transport 14.869

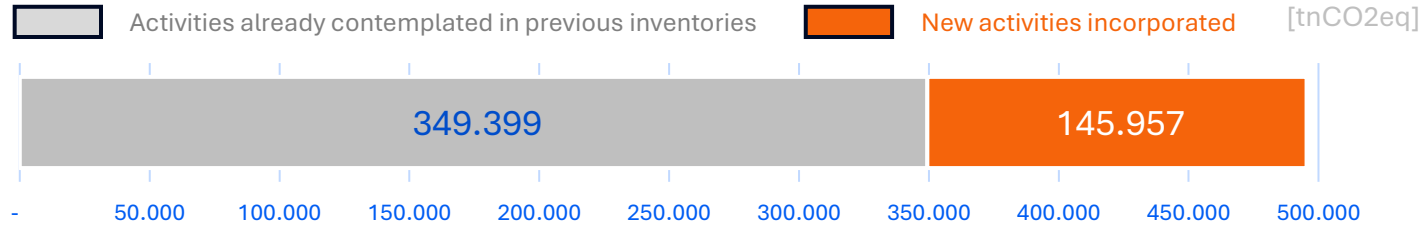
Terminals 11.312

Passengers & Employees 2.845

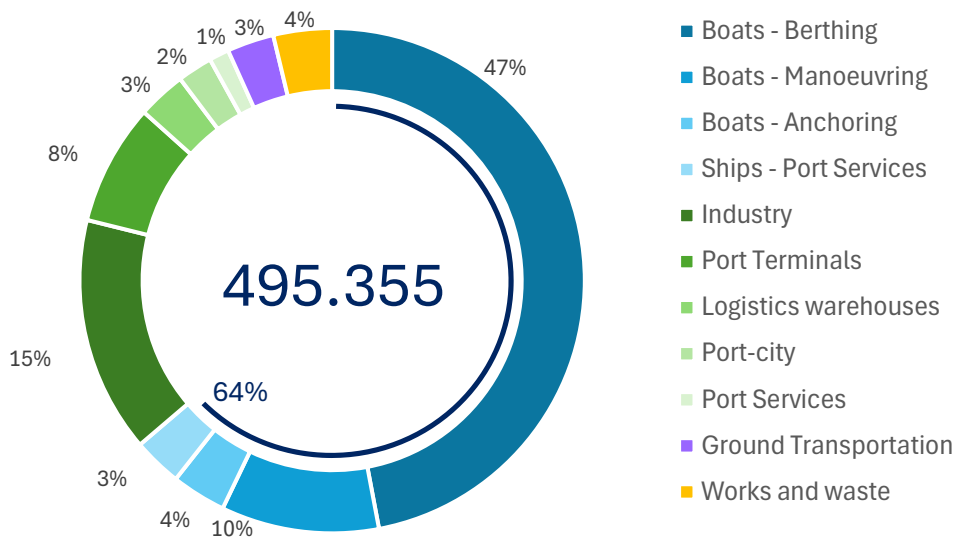
Railway 711

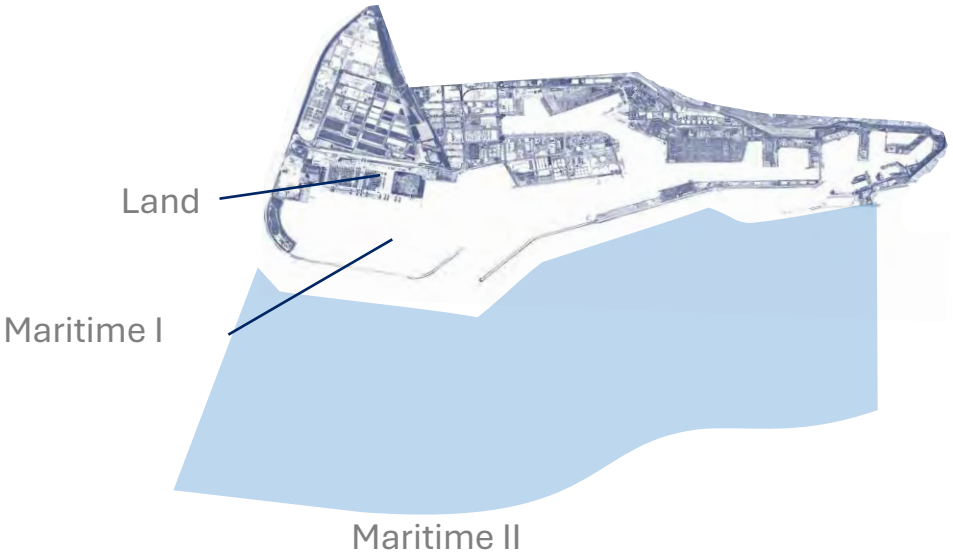
## Waste 11.417

MARPOL 11.417

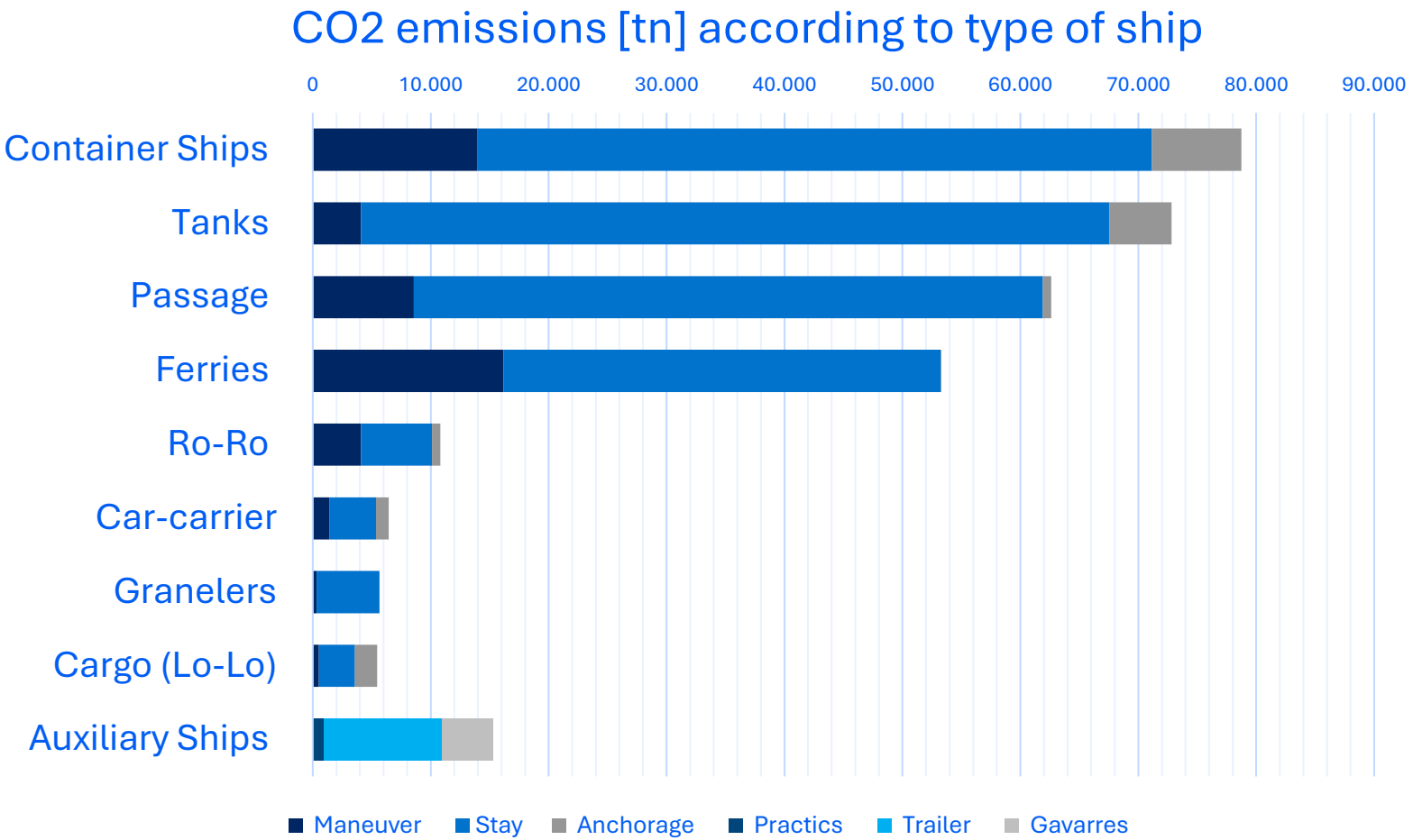



TOTAL $CO_2$eq emissions by activity [tn]



# 3.2 - Ships in the Port




The adoption of sustainable fuels, onboard CO2 capture or zero-emission systems at the port will be necessary to mitigate 14% of the port's emissions.


By 2030, the reduction in the carbon footprint could reach 24% thanks to the Nexigen project

# 4.1 – Energy Transition Plan

- ⚓ Alignment of the Strategic Plan
- ⚓ Promote new business models
- ⚓ Green Energy Hub
- ⚓ Energy as a strategic factor
- ⚓ Role of the Port

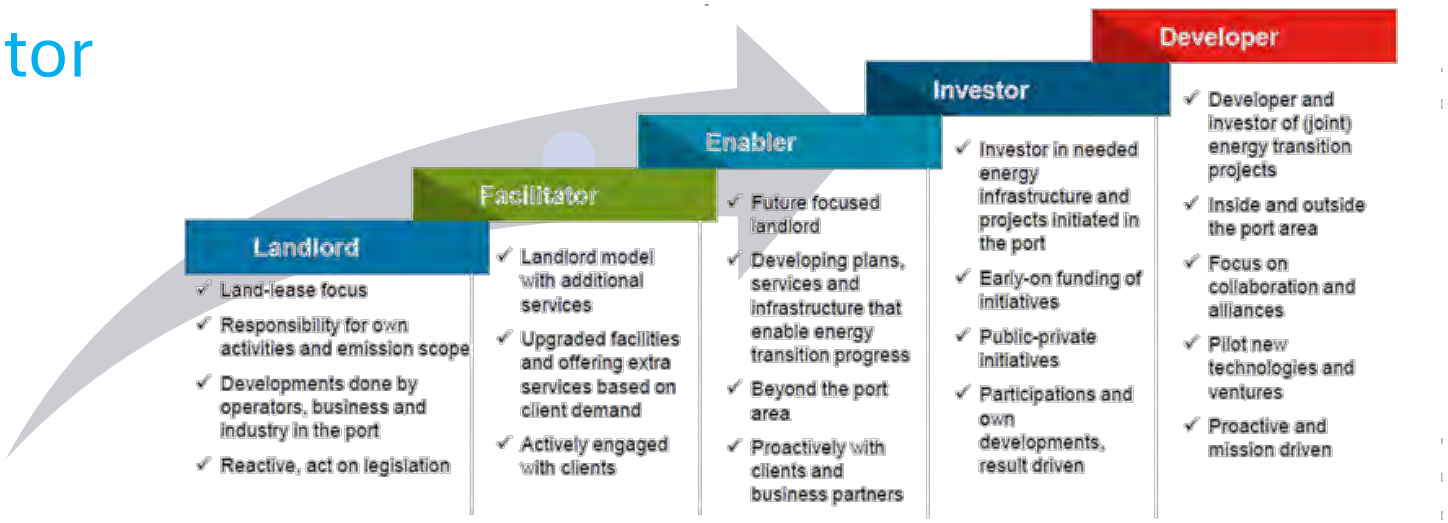




Figure 6-5: *Role development of port authorities*

# 4.2 - Energy in the Port. Mission & Vision

| GUIDING PRINCIPLES OF THE ENERGY TRANSITION PLAN | | | |
|---|---|---|---|
| Reduction of global temperature increase | Energy, sustainable and as a strategic factor | The Port of Barcelona as an energy HUB | Leadership of the logistics chain |

## Mission

**Ensure the supply of energy to the community, meeting the objectives of environmental and economic sustainability.**

## Visió

**SMART ENERGY HUB**

**To become a leading energy activity HUB where both logistics and innovative energy business models can thrive thanks to the offer of decarbonized and sustainable services and the guarantee of a competitive energy supply.**


# 4.3 - Distribution of energy consumption in the port

## Ships
1,156 GWh

| Anchorage | Maneuver | Bitter | Auxiliary |
|---|---|---|---|
| 65 | 195 | 838 | 57 |

## Transport

## Rodat
56 GWh

| Terminals | Passengers & Employees | Railway |
|---|---|---|
| 42 | 11 | 2,6 |

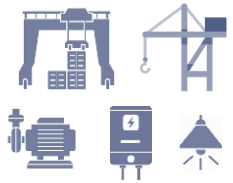
## Concessions
810 GWh

| | |
|---|---|
| 312 | Electricity |
| 383 | Gas |
| 115 | Fuel |

Port Premises cargo handling and vessels

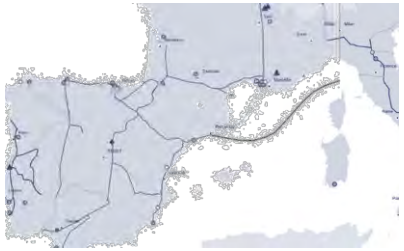


Port Premises Facilities

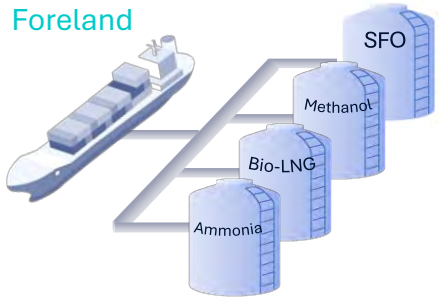


## The Port as a Clean Energy Hub

Hinterland

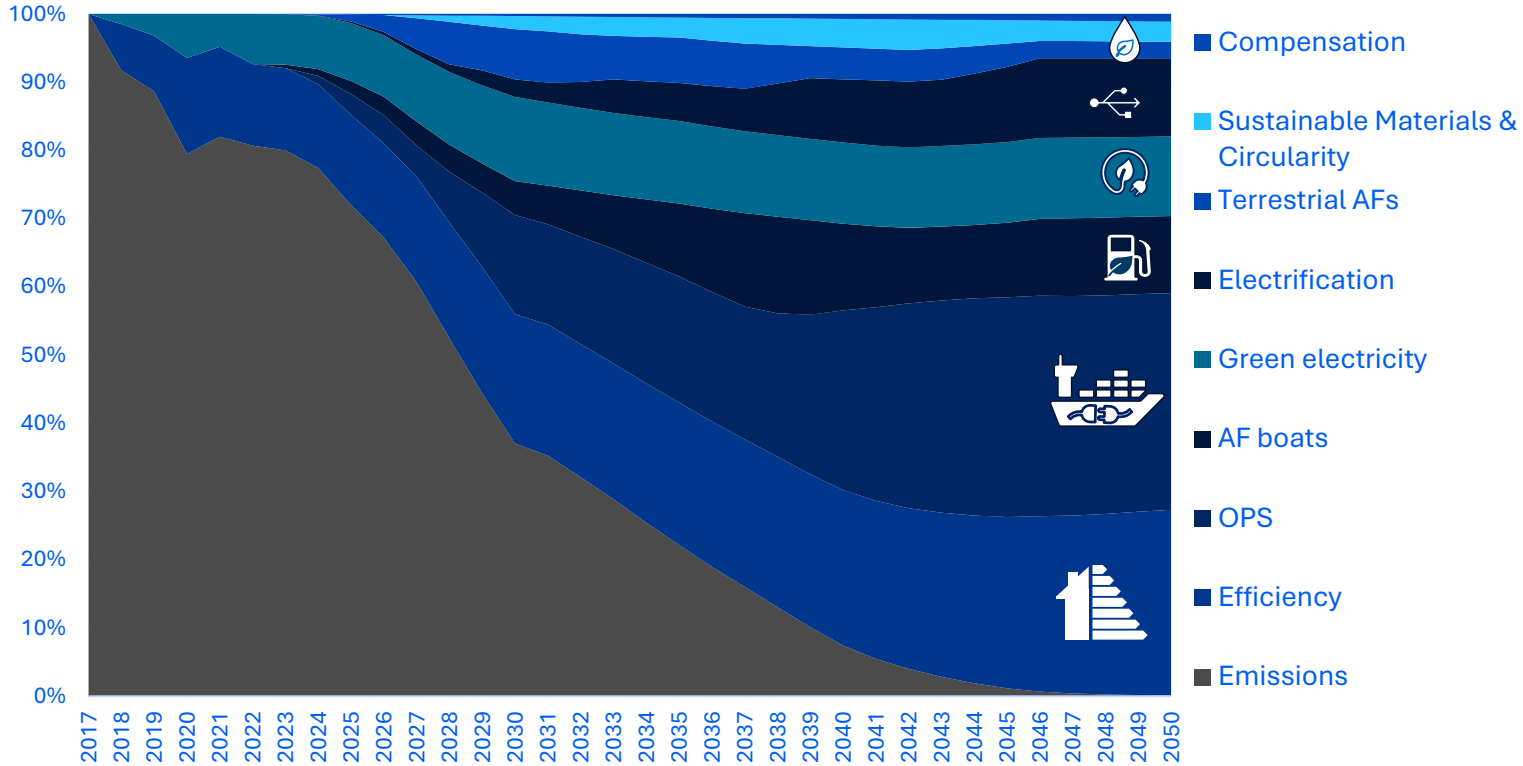


Foreland




[GWh]

# 4.4 - Energy strategy: Roadmap




### Terrestrial AFs Adoption

Biofuels & Hydrogen – road transport
Gas natural zero emissions - indústria
Green hydrogen - industry

### Electrification

Electrification of terminals

Electrification of road transport

Electrification of industry

### Green electricity

Promotion of large-scale retail adoption

Photovoltaic deployment with funding from the APB

### Alternative Fuels Supply Chain Development

Green methanol and biogenic LNG production plant
Four new docking points

Regulation of Bunkering (Methanol and Ammonia)
Rebates for the use of sustainable fuel and OPS

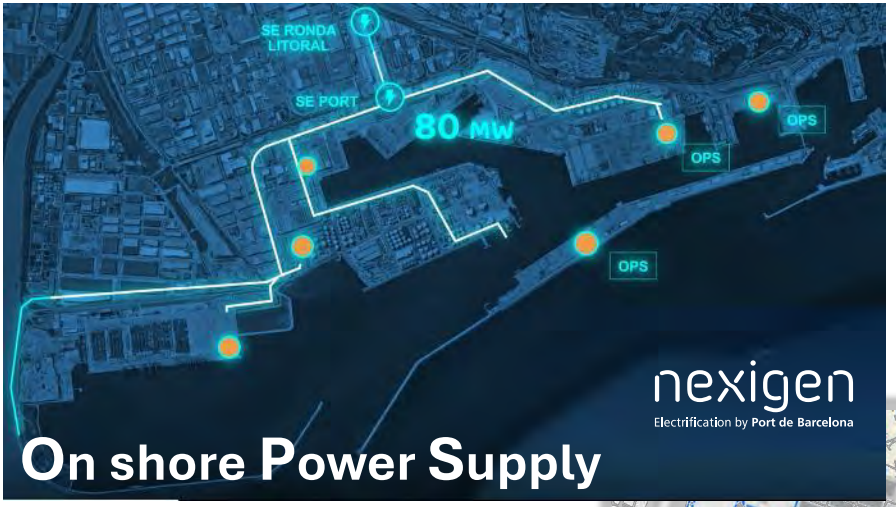
### Intermodality

Reduction of emissions in the territory due to the use of railways
Four new railway terminals
New accesses

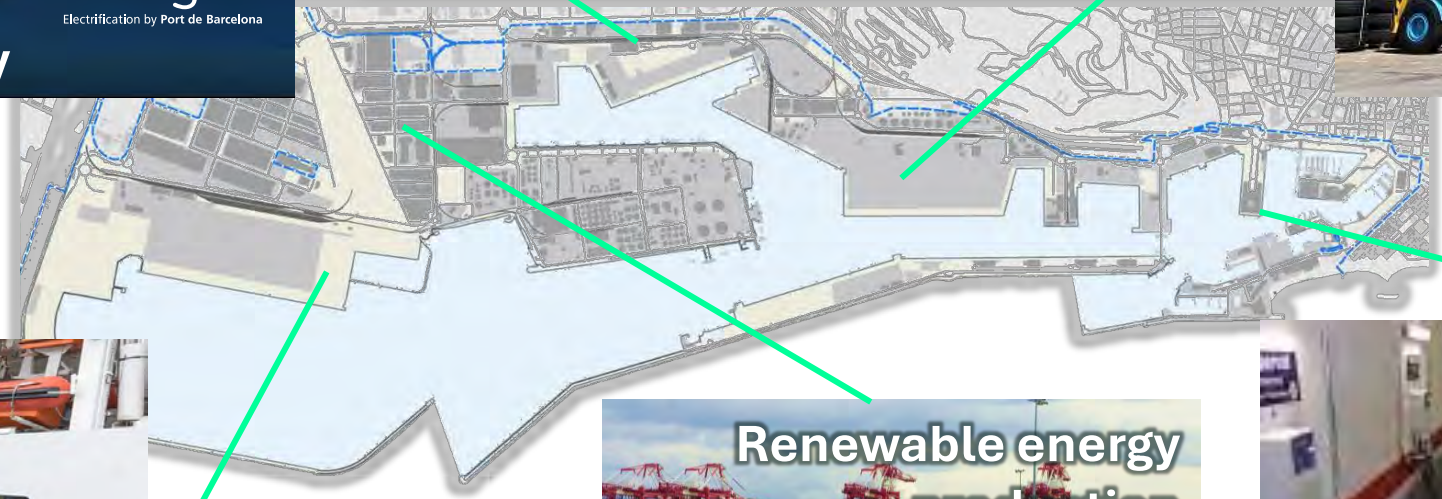
### Nexigen: electrification of docks

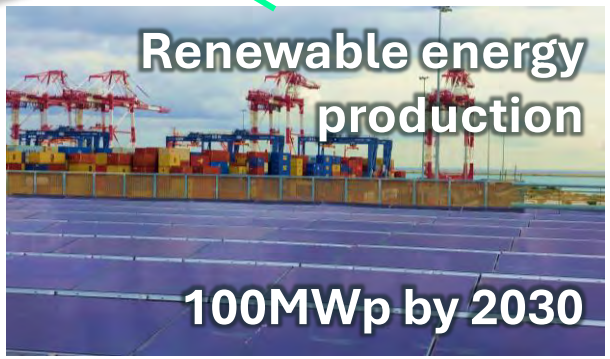
Pilot phase
Container terminals, ferries and cruise ships
Other terminals

# 5.1 - Electrification Projects




Electrical Master Plan + SEMS


# 5.1.2 - Progressive implementation of the OPS – *Nexigen Project*

**Investment**

€130
million 2022-2028

**Reduction of emissions**

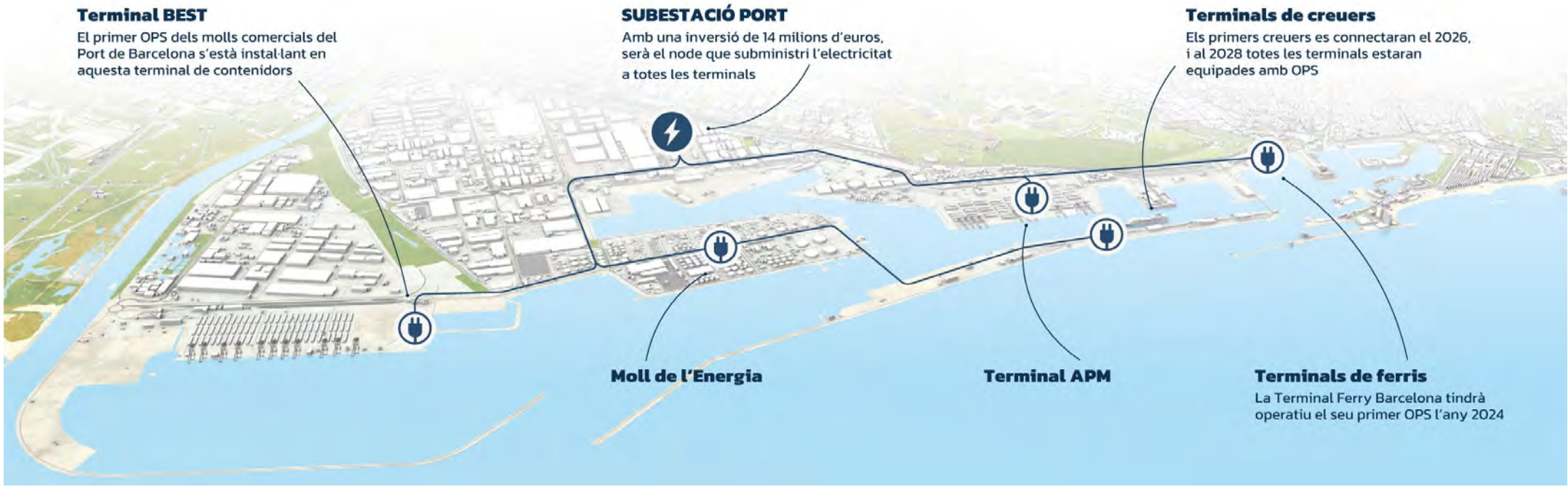
66,000
tonnes of CO2

1,234
tons of NOx

**Prioritizing**

Ships that generate the most emissions during their stay in port

Docks near the city




nexigen
Electrification by **Port de Barcelona**

# 5.1.3 Renewable electricity generation

Establishment of a Port Energy Company

Approx. 20 MWp installed


Potential of
**470MWp**
equivalent to
**630 GWh**

Covered

Car park canopies

Bus shelters at the terminals

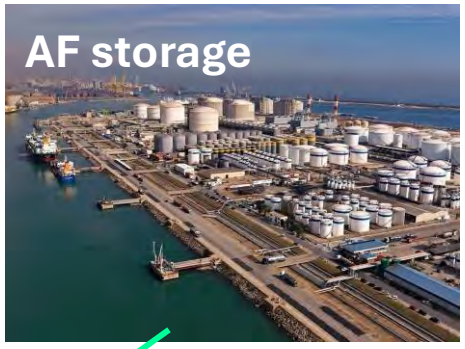
Long term

# 5.2 - Projects and actions in alternative fuels (AF)

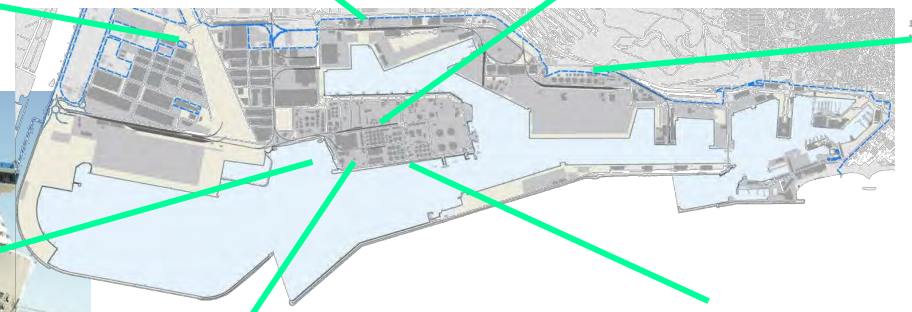
## Supply Chain Development

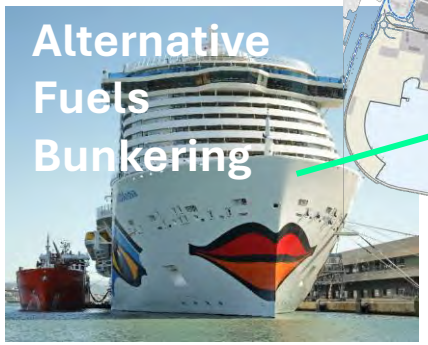
- Import - Export
- Storage and conversion
- Bunkering
- Production



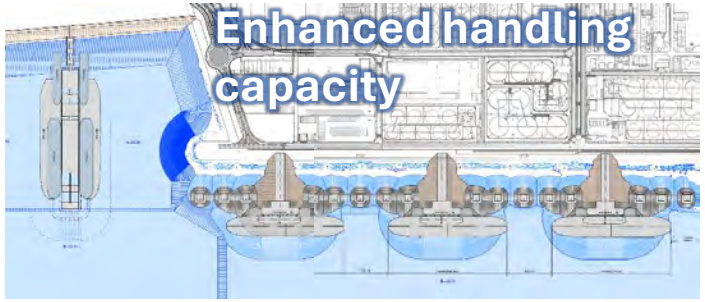










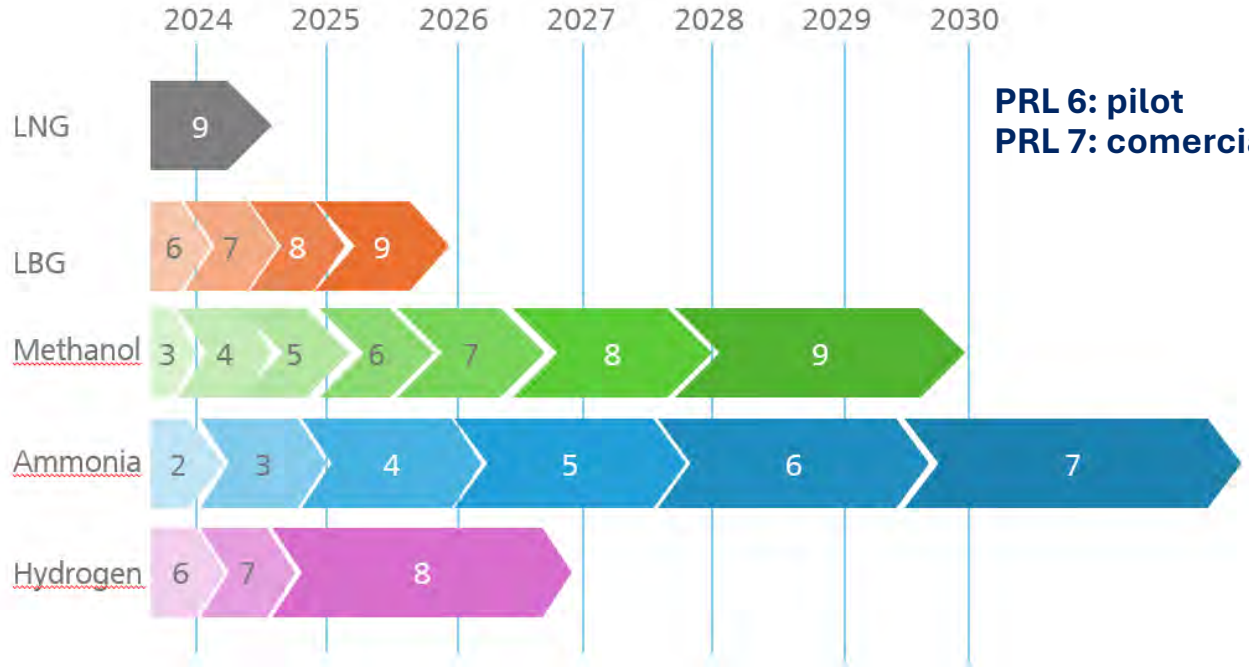
# 5.2.2 – Bunkering of AFs


Promotion of LNG as a transition fuel

The first Mediterranean port to have a *ship-to-ship supply* of LNG:

- Barge HUGESUND KNUTSEN

Liquefied Natural Gas, a transition fuel that substantially reduces NOx, particulate, SOx and GHG emissions



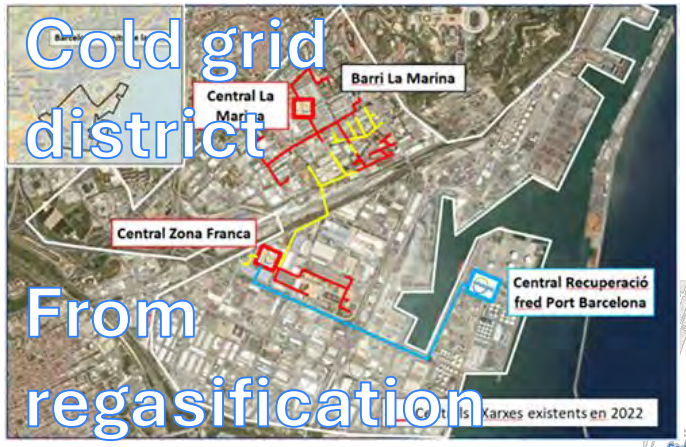

Bunkering safety protocols and commercial specifications for bunkering

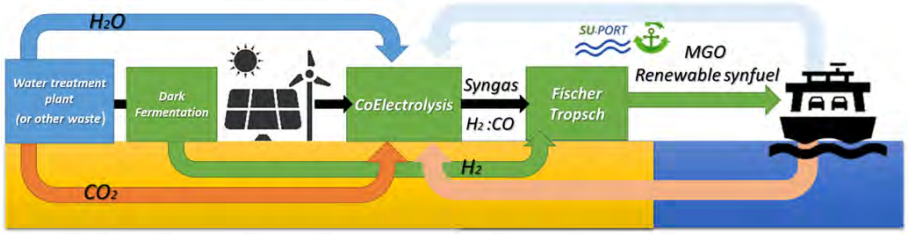
Procedures for authorisation of operations

Availability of alternative fuels: Infrastructure (pontoons, pipes) and tanking

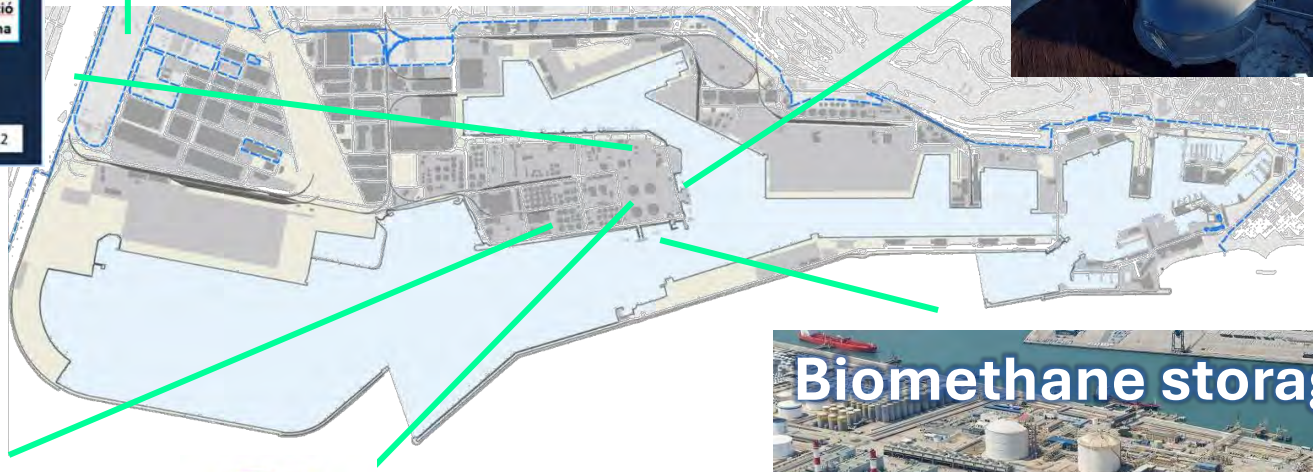
Demand aggregation: green corridors (cruise ships, car carriers or container ships)

# 5.3 - Projects and actions in the Circular Economy



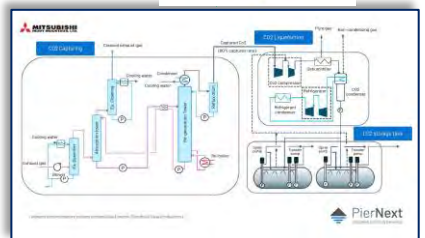









CO2 Capture from industry




# 5.4 - Decarbonisation of land transport

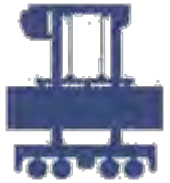
Heavy transport (trucks)

Port machinery


Containers


UTIS


Liquid bulk



Straddle carrier

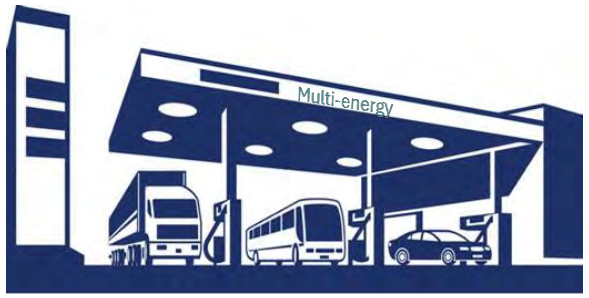
Reach stacker


Solid bulk


Car-carrier


Logistics

*Electrification*
*fuel cells*
*Alternative fuels*




Hydrogen
Battery / cell chargers
Synthetic fuels

Hinterland:
Hydrogen/e-
chargers

# 5.4.2 - Conversion of truck fleets

Deployment of a network of electric charging stations (electroliners) and hydrogen supply stations (hydroliners or hydrogen), and the logistics of new zero-emission fuels (biomethane, HVO and synthetics). Green character.


Electric charging. First phase

- 600 kW with 4 connection satellites with two hoses each.
- Service to 2-4 trucks simultaneously
- Loads of 350 kW for tractors and 150 kW for rigids

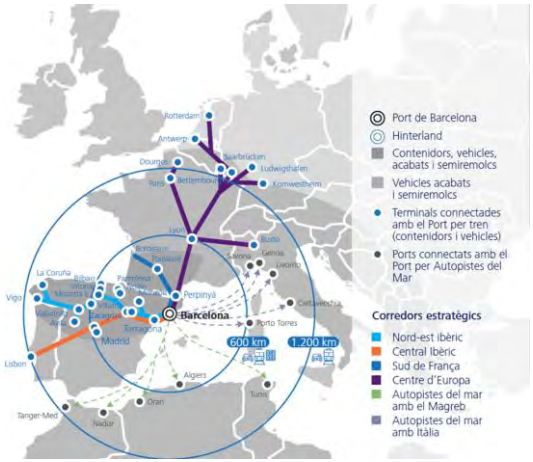

Supply of H2. First phase

- Two supply points at 350 and 700 bar.
- Service to 2 trucks simultaneously and up to 10 trucks per day

Storage of 500 kg H2

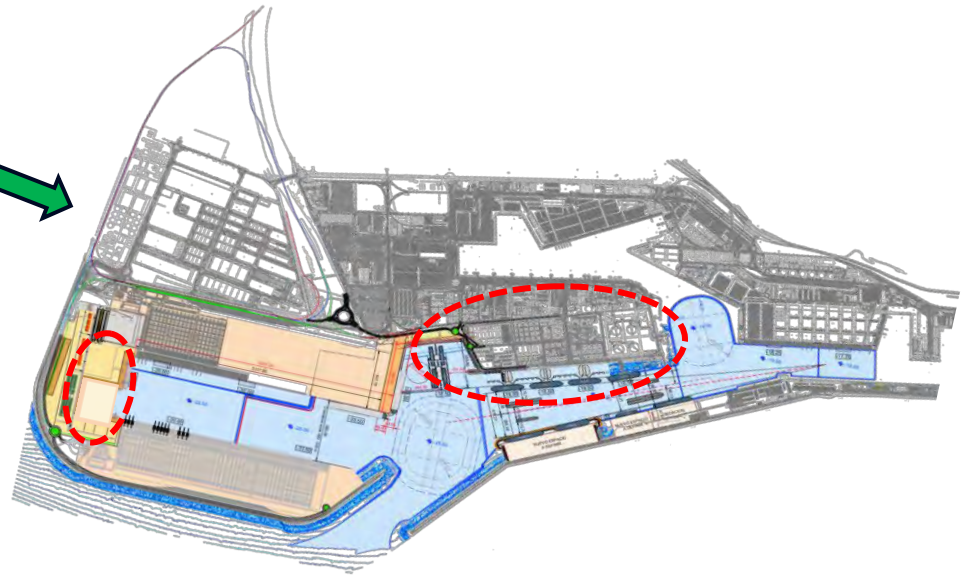
# 5.5 - Port planning, adaptation to the changes that come

## MULTI-MODALITY






- The port is in continuous improvement
- Limited space and high value
- Ensure availability for:
  Strategic value-added facilities.
  Spaces dedicated to green energy, new rail and road accesses and new *0-emission* terminals : Reorganisation of the South



**From now to 2031**: New railway and road accesses – 3 new rail terminals directly connected: Europe and National grid

**Increasing railway sharing from 15% to >30%**

**Connected to industrial and urban hinterland**

Thank you for your attention