



APDL's Sustainability Road Map

Ports as energy hubs and nodes of
the maritime energy corridors

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Brest, France



APDL

ADMINISTRAÇÃO DOS PORTOS
DOURO • LEIXÕES • VIANA

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PORT OF
VIANA
— APDL —



PORT OF
LEIXÕES
— APDL —



TERMINAL FERROVIÁRIO
MERCADORIAS LEIXÕES
— APDL —



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VIANA
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TERMINAL FERROVIÁRIO
MERCADORIAS GUARDA
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URBAN PORT

Sustainable paradigm

Resilient ports

Investment in Core
Business and
Business
Diversification



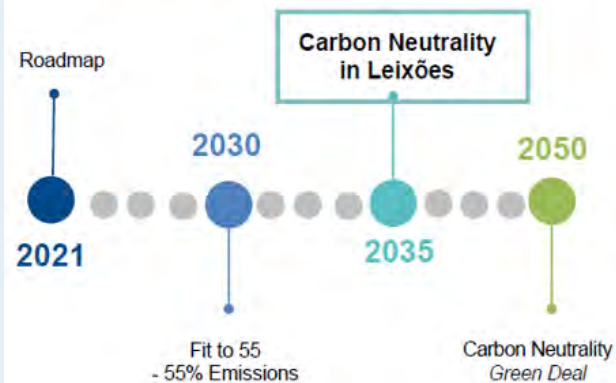
#2035APDL



PORTO DE
LEIXÕES
APDL

APDL Carbon Neutrality Roadmap

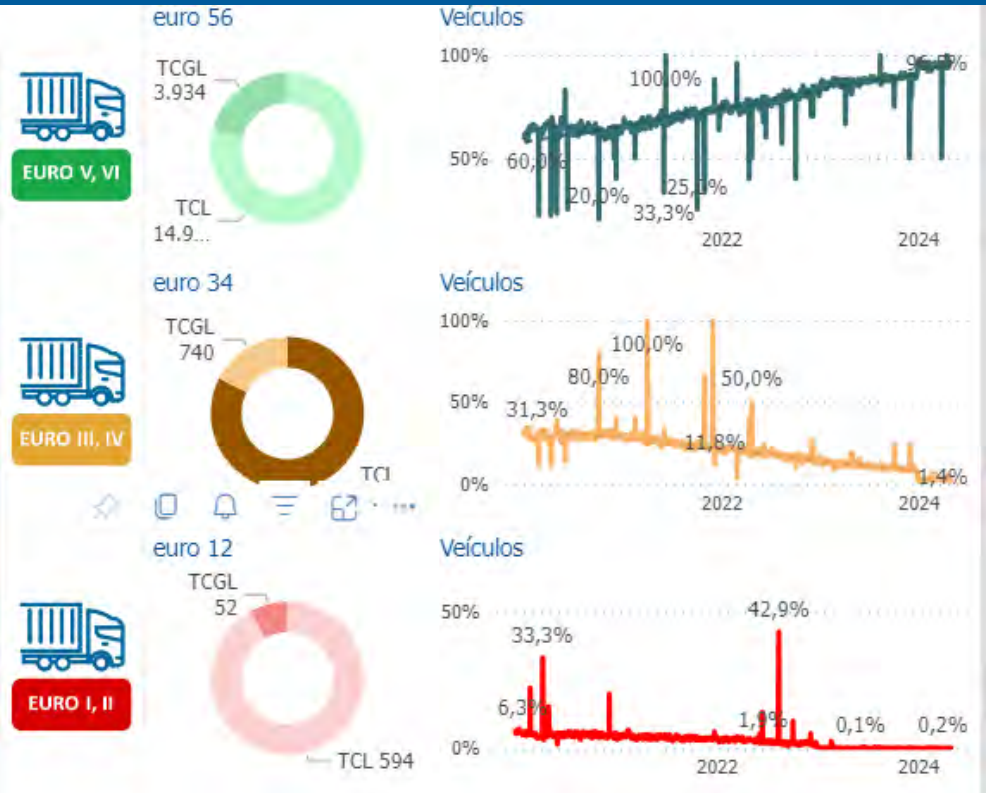
Anticipating EU and Fit for 55 goals due to Climate Emergency



	ACTION PLAN	MAIN OBJECTIVE
1.	ONSHORE POWER SUPPLY (OPS)	Decarbonisation of maritime traffic during its stay at the Port of Leixões.
2.	RENEWABLE ENERGY	Use the resources of the port to produce clean energy and become a self-sufficient port.
3.	ALTERNATIVE FUELS	Support the energy transition of the Port of Leixões through the implementation of new digital technologies.
	ELECTRIFICATION OF PORT ACTIVITIES	Decarbonisation of port activity and land traffic.
4.	DIGITALISATION	Support the energy transition of the Port of Leixões through the implementation of new digital technologies.
5.	AIR QUALITY	Monitoring of the real impact of the implemented measures on the improvement of air quality.
	ELECTRICAL GRID	Availability of an electrical network with sufficient capacity to supply the new demands foreseen for the port.

Emissions





• Prohibiting the entry of trucks with Euro I, II, III and IV certification in the Port

DECARBONIZATION E ELECTRIFICATION

- Reduction of Gas Emissions from Trucks and Tugboats
- Measuring Air Quality
- Eco-Truck



↓ **tCO_{2eq}**



• Electrification of Port Activities (forklifts, reachstackers, cranes and other equipment)



• Electric and Hybrid Vehicles Fleet



• Electric Vehicles Charging Stations
• Shuttle eléctrico portuário



ELETRIFICACION DE TERMINALES

O1. OPS - ON SHORE POWER SUPPLY



- Connection to the High Voltage Network (HV)

- Development of the Medium Voltage Network (MV)

- Development and Implementation of a Pilot

- Installation of OPS on Specific Piers

- Connection to the Ships' Electrical Grid during Docking

- Reduction of Noise produced by Ship Engines

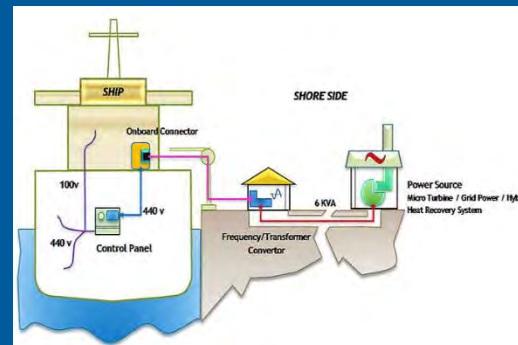
- Improving the Health and Quality of Life of the Surrounding Population

- Importance of Adequate Legal Framework

GEE CO_{2eq}

Reduce ship emissions (NO_x, SO_x, PM)

Requires a major upgrade of port electrical infrastructure (HV e MV) and old vessels "retrofit"/update
7MVA >>> 73 MVA

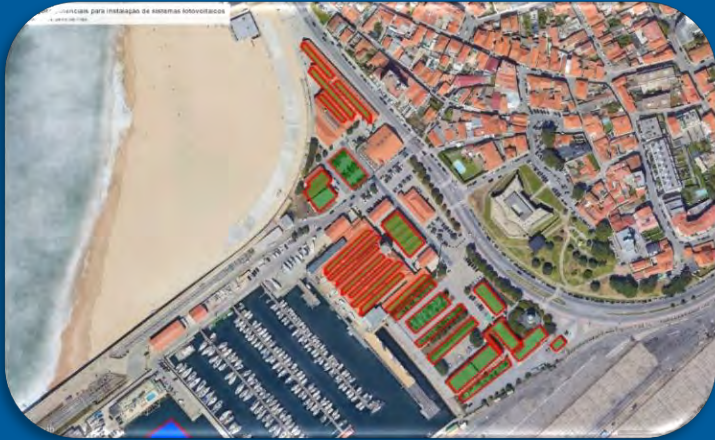


Regulatory Compliance

2. RENEWABLE ENERGY



SOLAR



WIND

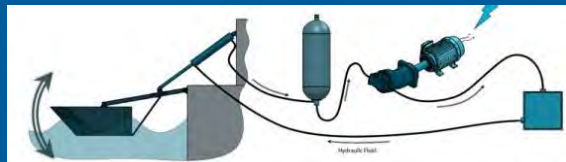


WAVES



Leixões

Douro



- PV Panels on Roofs of Buildings, Parking Lots and Floating Solar Panels
- 2 turbines of 4 MW each (**Wind Energy**)
- 1 MW Pilot (**Wave Energy**)
- Integration of Renewable Energy into Electricity Grids
- Producing up to **35 GWh/year** (Can be increased by producing in other APDL domains)



United Nations
Global Compact



OCEAN
STEWARDSHIP
COALITION



ALTERNATIVE FUELS

- Monitoring demand for Alternative Fuels
- Development of a Biodiesel Pilot
- Introduction of Carbon Rate
- Port Fees Reduction for Ships with Better Environmental Performance
- Green Fuels Storage (Hydrogen, Ammonia, Methanol)



4. DIGITALIZATION



➤ **Digitalization for energy transition:**

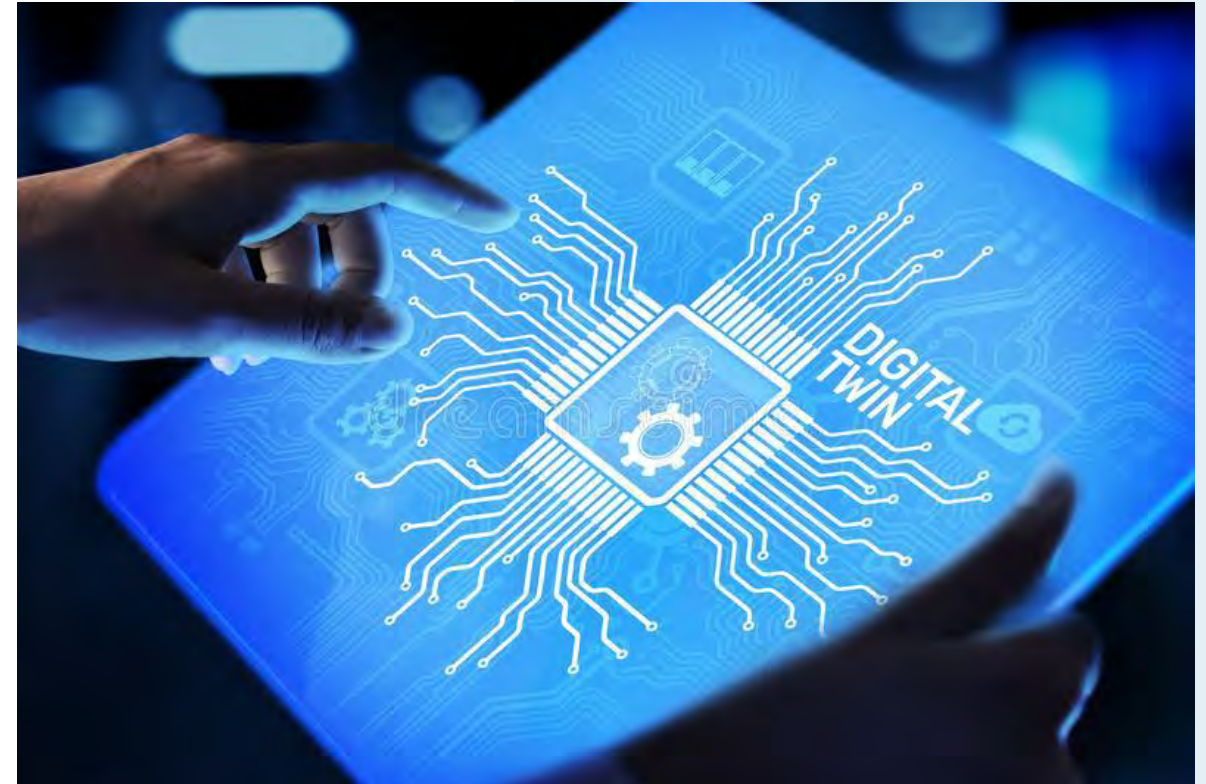
sensing, monitoring, smartgrid, BI/IoT and Blockchain

➤ **Extended gateways for dry ports:**

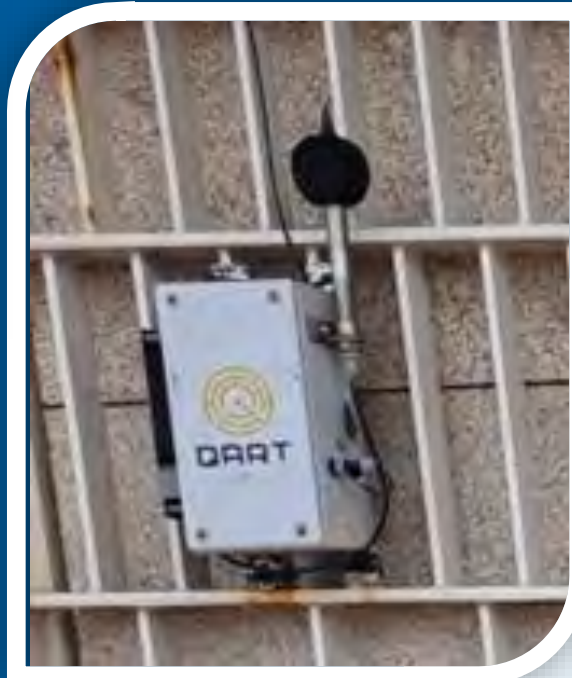
management platforms for Rail-road terminals and equipment (dialog boxes, barriers, etc)

➤ **Digital Twin:**


Safety- HAZMAT, Environment, Infrastructure, Hydrography, Port Traffic management, Testbed, Draw bridge management, Port Operations, Safety, SmartCity – port-city interface



5. AIR QUALITY




THE PORT OF THE FUTURE...




CARBON NEUTRALITY
Decarbonization
roadmap, energy
transition




DIGITALIZATION
Data center, LSW, Sensors, 5G,
IoT, AI, blockchain, cybersecurity




INFRASTRUCTURE
New terminal, north terminal
reconversion




OPS
On shore power supply




ALTERNATIVE FUELS
Fuels of the future
LNG, H2, NH3



AUTOMATION
Electrification, remote operation
and automation



RENEWABLE ENERGY
Energy mix, self-sufficiency,
diversification of energy sources



INTERMODALITY
Highway, railway, maritime
transport



MARITIME ACCESSIBILITY
Breakwater extension, dredging

THANK YOU !



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OBJETIVOS DE DESENVOLVIMENTO SUSTENTÁVEL

