



TREASURE

**TREASURE approach to Environmental Governance –multi-stakeholder supporting ecosystems for environmental quality in Mediterranean Ports
The Port of Piraeus**

*PP8 – Piraeus Port Authority SA / Pavlos Filippidis (External Expert)
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Context Analysis – Intro of PPA SA

- ❑ The central port of Piraeus holds significant geographical relevance due to its strategic location near Athens (~10Km), Greece's capital city. Situated on the eastern coast of the Saronic Gulf, Piraeus serves as the principal maritime gateway to the country.
- ❑ Piraeus Port connects continental Greece with the islands, is an international cruise center and a commercial hub for the Mediterranean, providing services to ships of any type and size.
- ❑ The port's geographical positioning at the crossroads of Europe, Asia, and Africa enhances its importance as a major hub for maritime activities. Its accessibility to major shipping lanes in the Mediterranean Sea facilitates the movement of goods and people between Greece and various destinations worldwide.
- ❑ Today P.P.A. S.A. employs more than 1.000 people and annually provides services to more than 24.000 ships. P.P.A. S.A contributes towards the local and national economic growth and is further developed by upgrading both the infrastructure and the services provided.
- ❑ Situated close to the international trade routes, the port is a hub of international trade being the only European port in the East Mediterranean with the necessary infrastructure for the accommodation of transshipment cargo.



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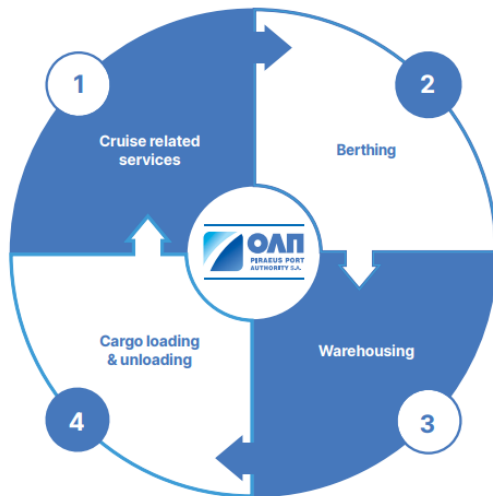
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Services and Infrastructure

An extensive range of services is offered that make the Port of Piraeus a strategic maritime transport hub in the Mediterranean and which are all fundamental to our operation, strategy and economic performance.



The Port comprises **5 business units**
and a **logistic terminal**

Container Terminal



The **Container terminal** at Pier I operates a critical hub for containerized cargo, offering services that support the smooth handling of global trade. It has an annual capacity of 1,100,000 TEUs and operates 24 hours, 365 days per year. The infrastructure within can accommodate the largest container carriers, with a total pier length of 1,150 meters, a maximum depth of 18 meters and a total storage area of 72,400 m². Moreover, the pier holds advanced port electromechanical equipment, promoting operational efficiency and capacity. It features 8 Ship to Shore Cranes, 5 Over Super Post Panamax Twinlift and 3 Panamax Twin-lift, 1 Harbor Mobile Crane, 8 Rail Mounted Gantries (RMGs), 22 Straddle Carriers (1 over 2 high), 36 Terminal Tractors, 2 Reach Stackers and 4 Empty Container Handlers.

Cruise Terminal



The **Cruise Terminal** is supported by three terminals, Terminal A – Miaoulis, Terminal B – Themistocles, and Terminal C – Alkimos. It holds 11 positions for berthing, while two additional berths are under construction to host larger vessels. The cruise terminal is essential for the economic development of both the port and the wider region, through the tourist exchange currency and the relevant services developed to cover tourism needs, such as arrival halls, parking areas for buses, taxis, X-ray machines and immigration desks.

Ferry Terminal



The **Ferry Terminal** supports regional connectivity, providing critical transport links for passengers and vehicles. The terminal supports the national mobility network, while several measures to enhance security have already been completed and investments are planned to strengthen infrastructure and security.

Ro-Ro Terminal



The **Ro-Ro Terminal** is one of the biggest hubs for local, transit and transshipment cars of the Eastern Mediterranean, Black Sea and North Africa. In addition to loading/unloading and storing new vehicles, all kinds of wheeled cargo are handled, heavy machinery, trucks, low roll trailers (mafi), trailers, etc., as well as general cargo. The Ro-Ro is located in Terminal G2 in the area of Keratsini – Drapetsona and has a storage capacity of 6,700 vehicles. The expansion of Herakleous Pier, has recently been completed by 40,000m² to offer through the terminal more

PPA SA key insights



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Piraeus Port



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Passenger Port / Central Port



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Cruise Port



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Container Terminal



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PPA SA Environmental Challenges & IROs

Environmental IROs (Impact Risk Opportunities)

TOPIC	IRO	TYPE	ACTUALITY/ POTENTIALITY
Climate Change	Energy Consumption and GHG Emissions	Negative	Actual
	Energy Mix (opportunity)	-	-
	Climate Change Adaptation	Negative	Actual
	Climate change mitigation	Negative	Actual
Pollution	Pollution of Air	Negative	Actual
	Pollution of Coasts, Water Column and Sediments (Company Specific)	Negative	Actual
	Noise pollution (Company Specific)	Negative	Actual

To manage significant impacts, risks and opportunities PPA S.A. has developed an integrated management system which has been certified with ISO 9001:2015, ISO 14001:2015 and ISO 50001:2018, since 2022. Currently, Scope 1 and 2 emissions are certified annually, in line with ISO 14064-1:2018 standard and the requirements of the Greek Climate Law (4936/2022).

ENVIRONMENTAL CHALLENGES OF THE CENTRAL PIRAEUS PORT



Air Pollution

Ship emissions and port-related exhaust



Water Quality

Urban pollution, risk of spills



Urban Environmental Pressure

Air quality, green spaces, living conditions



Noise, Light, and General Pollution

Nuisance pollution



Climate-Related Risks

Energy and infrastructure pressures



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PPA SA Environmental Regulatory Framework

Port's Master Plan

Strategic Environmental Study

EIA_New Environmental Terms Approval Decision

Integrated Environmental Management System

PPA S.A.'s Integrated Management System



The management system applied enables ongoing environmental improvement through identification and early detection of issues as well as regular monitoring. Environmental data and metrics for

energy use, GHG emissions and pollution are all audited by an external verifier¹ annually. To strengthen credibility and transparency pollution monitoring is carried out by certified contractors.



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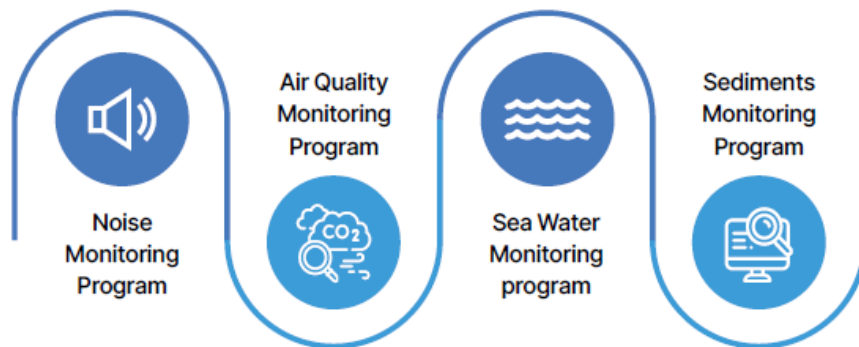
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Environmental Monitoring Programs

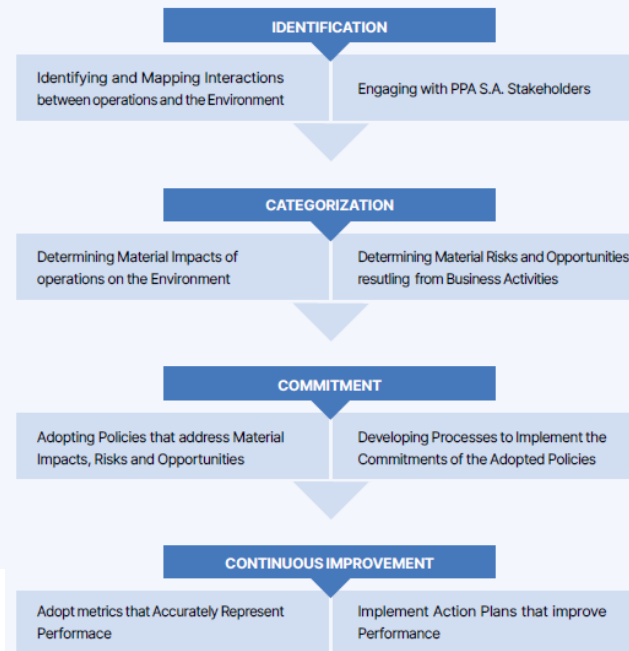
Integrated Monitoring Programs closely observe any potential pollution-related impacts caused by operations.



All measurements are carried out by certified external contractors as well as the National Technical University of Athens and are designed in alignment to the Company's Environmental Approval Decision and Integrated Management System.



Integrated Management System: Managing Impacts, Risks and Opportunities



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PPA SA – Map of Environmental Actions

PROVIDING SUSTAINABLE SERVICES TO SHIPS AND PASSENGERS | **PPA's ENVIRONMENTAL ACTIONS** | PRESERVING THE ENVIRONMENT AND ITS LIMITED RESOURCES FOR FUTURE GENERATIONS | A LEADER IN MEDITERRANEAN PORT ENVIRONMENTAL ISSUES | PROVIDING SUSTAINABLE SERVICES TO SHIPS AND PASSENGERS

Sea Water Quality

- Sea Water Monitoring Program Implementation
- Measuring Parameters: PH, Turbidity, Salinity, BOD, COD
- Enterococci, E-Coli, Total Coliforms
- TDS, Heavy Metals



Salamis Island

Noise

- Noise Monitoring Program Implementation
- Traffic measurements
- Noise barriers
- Container terminal (Pier I)
- Noise Mapping

Air Quality

- Air Quality Station
- 24h measurements
- Measuring parameters: BTEX, CO, NOx, SO₂, O₃, PM₁₀



Prevention & Response of oil & noxious substances spills

- Oil & HNS Contingency Plan Implementation
- Daily inspections of the port area
- Daily cleaning from floating substances



Improvement of the energy efficiency of the buildings

- Green roof on the administration building of the Container Terminal (Pier I)
- Partial capture of CO₂ emissions,
- Limitation of energy losses of the building and
- Improvement of the thermal isolation of the building
- Photovoltaic Park



Ship generated Waste Reception Facilities

- Waste reception Facilities plan
- Marpol Annexes I,II,III,IV,V,VI
- All ship types
- 24h services
- Environmental friendly technologies & methodology



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Environmental Challenges & Actions undertaken in Treasure

Sea Water & Sediments Quality Monitoring

- ❑ PPA S.A. has established a formal cooperation Agreement with the National Technical University of Athens (NTUA) for the collection and analysis of water and sediment samples in the Port of Piraeus.
- ❑ The NTUA carries out sampling and analysis missions in two selected port zones, the first sample was taken and examined in May 2025 and the second in May 2026, covering the full set of parameters defined in the accompanying matrix.
- ❑ The NTUA has draft a report and LoEs templates that will be used in project's tool Sediqua soft tool for the monitoring the quality of the Sediments & Water in Piraeus Port (Cruise terminal)
- ❑ PPA S.A. is planning to implement a pilot activity at the Cruise Terminal, focusing on the reduction of pollutant loads from stormwater discharges.



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Pilot site location/s (Google Maps pin)



The coordinates of the sampling locations are presented in Table 1, while the location of sampling points is shown in Figure 4.

Table 1: Sample Coding and Coordinates

Code	Lat (°)	Long (°)	Sample type
T311S	37.939606	23.632694	Sediment
T311N	37.939606	23.632694	Seawater
T323S	37.939410	23.628193	Sediment
T323N	37.939410	23.628193	Seawater



Figure 4: Location of study area and sampling point locations



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Reason for site selection

- **Urban run-off:** Water from rainfall washes contaminants from industrial areas, roads, and port facilities into storm drains, which then discharge into the sea.
- **Cruise ship pollutants:** These pollutants, including wastewater, ballast water, and accidental discharges such as fuel or waste, are released directly into the water.



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Challenges to be tackled with pilot solution

Main challenges to be tackled are the **urban run-off** and **cruise ship discharges**.

These pollutants **degrade water & sediments quality**, harm marine ecosystems, and affect port operations. Addressing these sources of pollution will ensure sustainable port operation.



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Testing Solutions Overview for Piraeus Port – Cruise Terminal

The following technologies are expected to provide a comprehensive **understanding of pollution dynamics in port environments** and evaluate the effectiveness of pollution reduction measures.

- 1. Oil Recovery Skimmer:** Oleophilic, free-floating skimmer, designed for oil recovery operations in varying environments and scenarios.
- 2. Multi-instrument for monitoring and measurements in the port waters:** Used for monitoring key water quality parameters such as pH, turbidity, dissolved oxygen, and salinity in port waters.
- 3. Sediment sampler with swimming and diving equipment, for collecting samples from the seabed and analyzing the quality - chemical composition:** A seabed sampler that collects sediment samples to analyze contamination from pollutants like heavy metals and hydrocarbons.



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1 – Oil Recovery Skimmer

- ❑ An oleophilic, free-floating skimmer designed for oil recovery operations in varying environments and scenarios.
- ❑ The modular system allows fast interchange from brush, to disc or drum recovery bank depending on the viscosity of the target oil.
- ❑ Proven oleophilic technology allows the system to achieve oil recovery rates of up to 99%.
- ❑ Designed with a shallow draft for portability, the skimmer is effective in operations to nearshore applications.



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2 – Multi-instrument for monitoring and measurements in the port waters

The Multiparameter instrument will be used to measure important water quality parameters, including:

- **Key Parameters:** pH, temperature, turbidity, dissolved oxygen (DO), salinity, and conductivity. These parameters will help evaluate the impact of both urban runoff and cruise ship discharges on water quality in the port.
- **Expected Results:**
 - Real-time detection of water quality issues, such as low DO levels or high turbidity.
 - Identification of pollution hotspots near stormwater outfalls or areas of high cruise ship traffic.



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3 – Sediment sampler with swimming and diving equipment, for collecting samples from the seabed and analyzing the quality - chemical composition

The Sediment sampler will be used to collect sediment from various locations within the port to provide a comprehensive view of sediment contamination.

- **Expected Results:**

- **Measurement of contamination levels in sediments**, such as heavy metals, hydrocarbons, and microplastics.
- **Assessment of how pollutants accumulate** in the seabed and their **effects on benthic organisms** (organisms living on the seabed).



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Timeplan & Milestones

- ❑ The equipment is expected to be purchased by **April 2026**.
- ❑ The testing of the equipment is estimated on the first half of **May 2026**.
- ❑ The 2nd sample collection and analysis will be conducted on the 2nd half of **May 2026**.
- ❑ The report with the findings of the analysis is expected first half of **June 2026**.



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Key stakeholders (and running Agreements)

Name of the organization	Role and agreements
Hellenic Ministry of Shipping and Insular Policy	Ministry. Policy provision and regulatory oversight / Current legislation
Hellenic Ministry of Environment and Energy	Ministry. It formulates, regulates, and enforces the environmental maritime policy / Current legislation
Environmental Protection Agencies	They monitor the environmental quality and implement pollution control measures in and around the Piraeus Port.
Shipping companies and vessel operators	Main users of the Piraeus Port
National & Technical University of Athens (School of Civil Engineering)	Scientific services: Implementing the environmental quality monitoring program on Air, Noise, Sediments and sea water quality . Often support PPA and stakeholders of the port to conduct environmental monitoring, research, and development of innovative solutions on the subject in the Piraeus Port (Cooperation Agreement also for TREASURE)
Living Prospects Ltd	Environmental Consulting services: Calculation of PPA SA Scope 3 emissions based on the ISO 14064-1:2018 and the acquisition of corresponding certification for all 3 Emission Categories (Scope 1, 2, 3) & EU projects (Cooperation Agreement also for TREASURE)
Other Key Actors	Other External colleagues already collaborated with PPA SA (Antipollution, HEC, ABS, Lloyds, BV, other external colleagues etc.)



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Territorial Protocol of Cooperation in TRESURE



- Signed between PPA S.A., NTUA and Living Prospects Ltd.
- Objective:
 - Establish a territorial lab (Mini-Lab)
 - Support WP2 monitoring & WP3 pilot actions, WP4 mainstreaming of results of the TRESURE project
 - Continue to operate after project's end
- Key features:
 - The activities include:
 - Two rounds of water and sediment sampling and analysis (in May 2025 & May 2026),
 - The completion of pre-formatted spreadsheets for Lines of Evidence (LoE1 for sediments and LoE2 for water),
 - The elaboration of two evaluation reports (June 2025 and June 2026 Shared data, reporting and evaluation
 - Conduct pilot activity in WP3
 - Elaborate WP4 – Action plan for transferring project's results



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The Mini-Lab Concept

Collaborative platform combining:

Fieldwork, Laboratory analysis, and data evaluation
Technical and consulting advisory

Roles:

PPA: Institutional role, Coordination, Monitoring, Logistics

NTUA: Scientific skills, Monitoring, Laboratory analysis

Living Prospects: Consulting & Technical skills on environmental issues,
Technical skills, Networking, Planning

Ensures alignment between science and port operations



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Main tools & equipment

- Standard water & sediment sampling devices
- 3 equipment tools to be supplied for testing (***Oil Recovery Skimmer, Multi-instrument for monitoring and water measurements, Sediment sampler***)
- Laboratory instruments of NTUA for chemical and physical parameter analysis (spectrophotometers, turbidity meters, particle analyzers)
- Data management software for recording and interpreting results
- Sedicalsoft tool for monitoring environmental status of the port



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Synchronizing Port & Laboratory Operations after project's end

- **The Main Challenge**

- The complexity of synchronizing operational schedules with laboratory timelines, due to the busy port environment and the need for precise sampling conditions
- Need for funds after project's ends.

- **Mini-Lab added value**

- Bridge governance and technical implementation
- Support evidence-based decision-making
- Improve coordination across institutions
- Can continue operating beyond project lifetime



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Thank you!

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