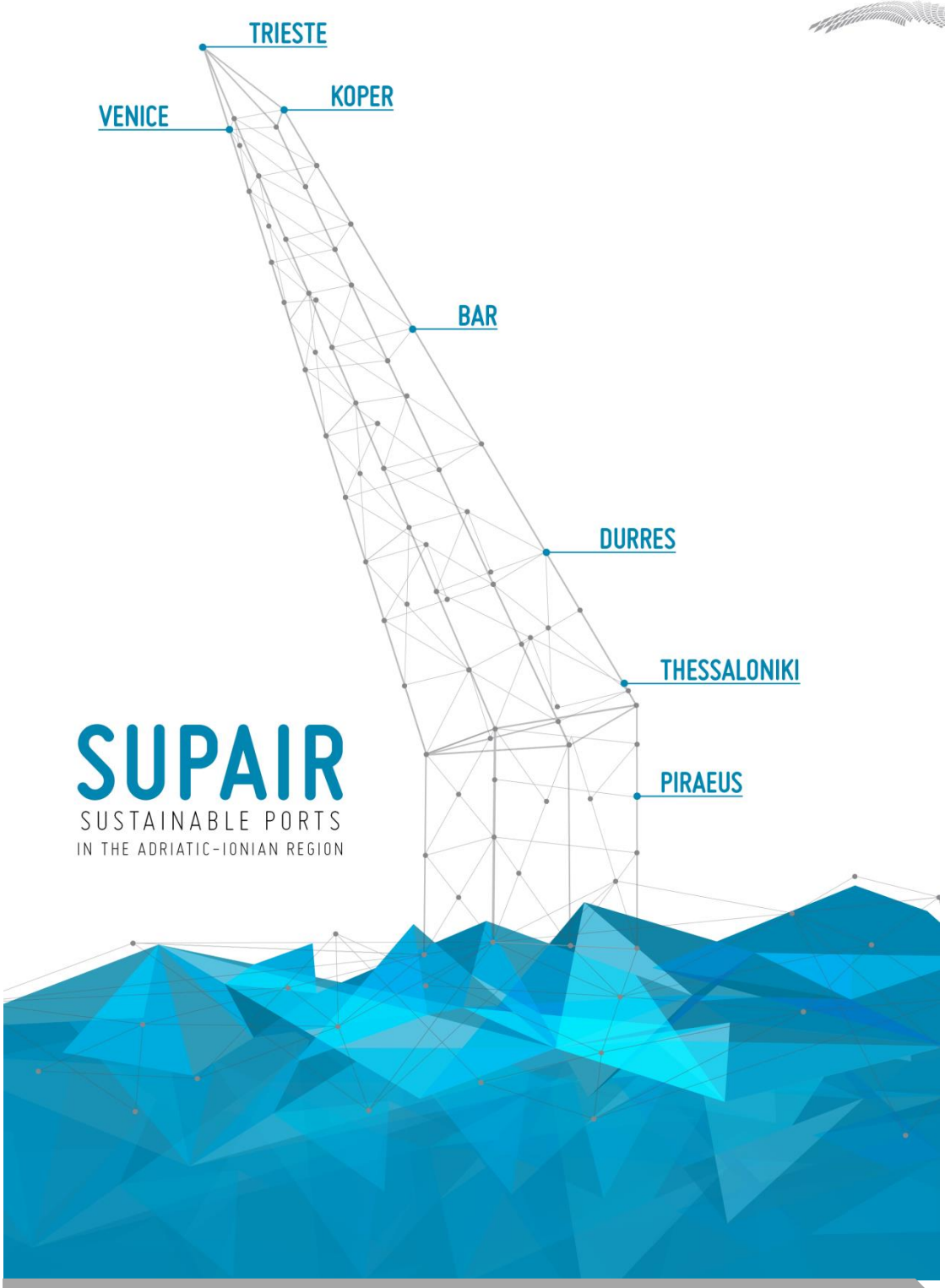


Action Plans for a Sustainable and Low Carbon Port of Durres

AUTHOR/INSTITUTION: Edmond ALITE (EML Consulting)

WPT1

Project co-funded by ERDF and IPA II fund

Last update: 26th December 2019

Work package: WPT1

Deliverable title: T1.6.1 Action Plan for a Sustainable and Low-carbon Port of Durres

Expected date: November 2019

Description: Durres Port Authority Action Plan is focused in 4 actions: Revitalization of Green Spaces within and outside the port areas, A Recycling Plan for a Sustainable Port, A Mobility Plan for Durres Port Staff to increase the use of green transport modes and Clean Energy Investment (renewable).

Partner responsible for the deliverable: DPA

Document Author(s): Edmond ALITE (EML Consulting)

Dissemination level: PU - Public

Status: Final

Version: Six

Document control

Revision History

Version	*Date*	*Author*	*Organisation*	*Comment*
V 1	14 Jan 2019	Afroviti Goge Blerina Hasani	DPA	DPA – Action Plan Interim Version (chapter 1 - 4)
		Marco Mazzarino	VIU	VIU review
	12th February 2019	Silvia Zampese and Fabio Tomasi	AREA	AREA review
V 2	08 April 2019	Edmond Alite, EML Consulting	DPA Consultant	DPA – Action Plan (Chapters 1 – 4) Revison
V 3	20th May 2019	Edmond Alite, EML Consulting	DPA Consultant	2nd Activity Report, First Draft Durres Action Plan
V 4	26th June 2019	Edmond Alite, EML Consulting	DPA Consultant	Final Report, First Draft Durres Action Plan
V5	16th December 2019	Lucio Rubini	VIU	VIU review
V6	26th December 2019	Serena Kovaçi	DPA	Final Revision

The content of this document reflects only the author's view and the Programme Authorities are not liable for any use that can be made of the information in it included

Index

1. Definition of "sustainable port as a key element of wider low carbon strategies"

A sustainable and low-carbon port is one that in close consultation with its users and stakeholders commits into, proactively plans and responsibly and continuously works towards ensuring economic prosperity and long-term improvement of the quality of life in the port area and the urban community it serves. Considering existing needs as well as the needs of future generations, a sustainable and low-carbon port puts forward and deploys different measures, actions and strategies, following an integrated approach, for efficiently protecting and managing natural and human resources, ensuring environmental protection and climate change mitigation and exploiting and widening the use of environmentally-friendly technologies and renewable energy sources.

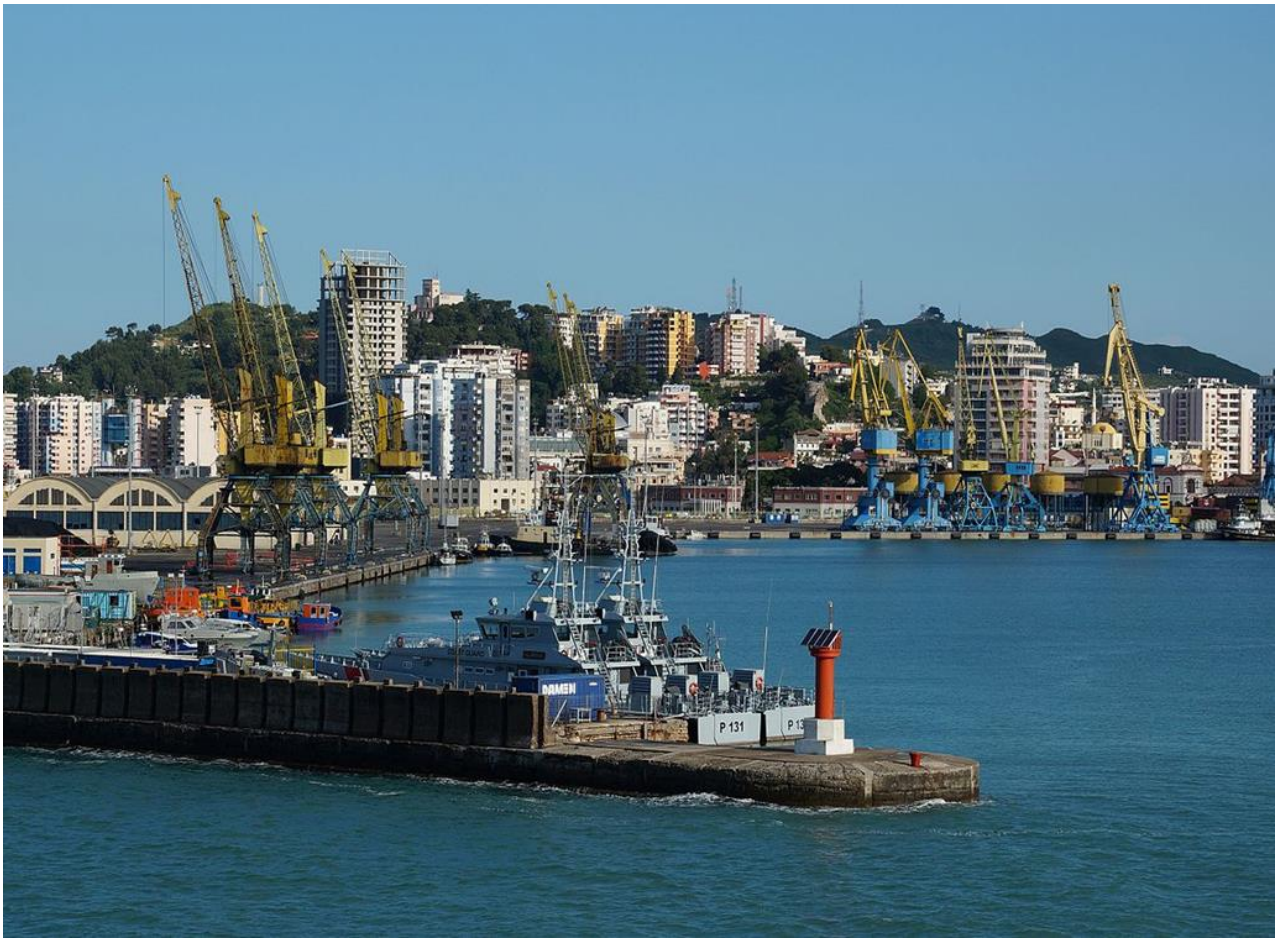


Figure 1 - Port of Durres

2. Understanding current port operations and management models

GENERAL PORT INFORMATION:

The Port of Durres is the largest seaport of Albania. The port is situated in the city of Durres. An artificial basin is formed between two moles, with a west-northwesterly oriented entrance approximately 183 meters wide as it passes between the ends of the moles. The Port is located at the north end of the Bay of Durres, an extensive body of water between "KALAJA E TURRES" and Cape of Durres.

As of 2014, the port ranks as the largest passenger port in Albania and one of the largest passenger port in the Adriatic Sea, with annual passenger volume of approximately 1.5 million. The Port of Durres has approximately 763 meters of alongside pier space on the West Mole and a fishing harbor lies at the north end of the East Mole. Several wrecks are located near the entrance channel to the Port of Durres. The use of tugboats is compulsory in the Port of Durres.

As of 2011, the port is undergoing major renovation and expansion. Following a shift to a landlord model, the core role of **Durres Port Authority** is port development, investing in better port infrastructure, establishing good customer relations with port users (concessionaires, shipping lines, importers and exporters), active business development to attract new port users, and initiatives to enhance the quality of the overall port product (rail access, an ICT platform, administrative procedures,).

Four major Operators, three private and one public, handle all port operations.

Figure 2 - Port of Durres Operators

General Passenger Services:

Mobility and Info Mobility Existing Services:

- Public transport Bus stop in walking distance
- Railway Platform
- Direct Connections to Railway Station from the Passengers Terminal
- Taxi Service (Situated at Port Entrances)

Passengers Terminal Facilities recently renovated, with:

- Benches for resting;
- Toilet facilities;
- Touristic Info Point (light infrastructures: information desks, totem and monitors);
- Food and beverage area (bar, restaurants, etc.);
- Wi-Fi network free;
- Luggage storage
- First aid equipment (heart impulse, …);
- Services for passengers with reduced mobility;
- ATM point;
- Air conditioning;
- Waiting area/room;
- Waiting garden/roof;
- Real Time information for ferries

Safety & Security is high quality, includes:

- Safety video-control system
- Electronic check-in system for passengers and vehicles
- Security team
- Body scanner
- Video surveillance
- Stairs to get out of water in case of accident
- Secure pedestrian paths

Key Elements missing related to the **Mobility** within the port area:

- Port Staff awareness of the importance of using sustainable transport mode
- Parking lot for bicycles
- Bicycle Lanes
- Terminal for Cruise Passengers
- Connections to airport Bypass/ring road directly access

Environmental Management Organization

The Port of Durres is more than cranes, cargo, terminals, ships and international trade; it is successful in another way. Environmental protection is a core value of the Port of Durres and is a very serious responsibility. The Environmental Management Sector has several duties:

- As a port having environmental services (since 2004), the first action of Port is to implement an extensive environmental policy with a rigorous appraisal procedure for all new projects. Further, to identify any potential risk to the natural environment, the Port conducted a full environmental audit of all marine facilities;
- It is working with other stakeholders to share information and coordinate environmental projects and plans;
- The participation of all of these stakeholders begins with initial planning. They identify environmental problems in the preliminary designs and begin timely investigative programs to gather environmental data. They also help to design procedures and features into the development plan to mitigate environmental impacts that might result from the construction and/or operation of new facilities;
- The Port Environmental Department administers the port's internal environmental review process and plays an important role in guiding the development proposal through external environmental reviews. In addition, it provides information and interprets complex technical issues for concerned members of the public and affected areas.

Key Elements missing related to the environment management

- Recycling bins for differentiated waste for recycling purposes
- Trainings for the administration with a recycling guide

Lack of Renewable Energy Investments

The Port of Durres is one of biggest energy consumption authority in Albania. Until now, there has been no effort whatsoever to switch to renewable sustainable energy.
In the 2019 development plan, there has been a strong interest from the DPA to invest in the renovation of all buildings with focus on efficient energy materials.
In addition, DPA is considering investing in the construction of solar panels sites within the Port area, in order to shift part of the energy consumption.

REGULATORY FRAMEWORK

National Strategy for Development and Integration (NSDI-II)

The NSDI-II defines Albania's vision for its national social, democratic and economic development over the period 2015-2020, including a roadmap for integration in the European Union following the granting of candidate country status on 27 June 2014. The present "National Sector Strategy for Transport 2016-2020" has been therefore, aligned with such governmental effort.
The development and modernization of Albania's transport infrastructure has been and remains one of the top priorities of the Government of Albania. The aim has been:

- to create the preconditions for the development of other sectors of the economy,
- to increase the accessibility of freight and passengers in trade and service delivery, and
- to significantly contribute to overall economic growth and development of the economy

The strategic priority is to accelerate the integration of Albania's transport system and the establishment of an integrated market comprised of transport infrastructure by land (road and rail), by sea and by inland waterways.
The main sector development goal for the period 2015-2020 is foreseen to be the "development of an efficient transport system, integrated in the region and in the EU network, which promotes economic development and the citizens' quality of life".

Albanian National Transport Plan (ANTP2)

Was released in 2010 and which has been maintained and updated annually since then. The general objective of the ANTP2 is to provide a safe, reliable, efficient and fully integrated transport system and infrastructure, aiming to meet the needs of freight and passenger customers, whilst being environmentally and economically sustainable. ANTP2 has been essential to support strategies for economic and social development as well as an optimal integration of the country's transport systems within international, European and regional transport networks. Based on these principles, the main specific objectives or goals are to:

- Create a regulatory and legal system which promotes the optimal operation of the transport system;
- Support the development of the economy;
- Ensure equitable access to transport throughout the country leading to an improved balance in the country's regional development;
- Reduce traffic bottlenecks;
- Promote integration with the European Union and meet the transport demand of the Southern Balkan Region;

- Improve safety, quality and reliability of the transport system;
- Provide enhanced focus on passengers and freight shippers as customers and users;
- ***Create an environmentally sustainable transport system***;
- Ensure transparency in the decision-making process.

Update of the Master Plan for the Port of Durres approved with the decision of CM no. 56 /2009

Objective is to decide optimal operational, commercial and financial strategies in long terms period. Master plan includes:

- Strategy & Policy
- Trade, Traffic Forecasting;
- Market Assessment
- Competitor Analysis
- SWOT Analysis
- Strategic Planning & Analysis
- Stakeholder Analysis
- Organizational Alignment
- Institutional & Regulatory Analysis
- Investment/Divestment Strategy
- PPP Strategy
- Pricing, Tariff Reform & Analysis
- Business Planning Preparation

Currently two important projects are completed:

- Construction of passenger terminal with all facilities, with funding of about EUR 22 million from EIB and EBRD
- Rehabilitation and extension of the eastern seabed and the squares for the processing of bulky goods, with a funding of about EUR 35 million from the EIB and EBRD.

Since 2016, the port is certified according to ISO 14001: 2004 and 9001: 2008 standards. According to the ISO 14001 Certification requirements, the Port Authority during its activity conducts the following:

- Integrates environmental issues in the company's decision-making;
- Constantly educates our report employees and contractors and encourages them to work environmentally friendly;
- Train, educate and inform our employees and private entities that conduct their activity at the port, about environmental issues related to their work;
- When developing port projects, it requires contractors to reduce waste through re-use and recycling as well as using recyclable materials in the project with innovative and environmentally friendly ideas.
- Cooperates with the Executive Director for minimizing unnecessary use of hazardous materials and products and takes all necessary steps to protect the health and the environment if such materials are used or stored in the port area;
- Drafts and refreshes the Anti-Oil Pollutant Pollution Plan in accordance with local legislation and whenever it is refreshed.

- Conscious and conscientiously aware of the environmental engagement of staff and entities operating in the port, as well as receiving various environmental initiatives by collaborating with third parties such as donors and other clients outside the port.
- During its activity focuses on continuous improvement of environmental performance and will minimize the impact and social damage of activities by reviewing environmental policies related to projects implemented year after year within the Port Authority.

Past Experiences Relevant To The Action Plan

- **ECOPORT 8 – Finished**: implementation of environmental policies, often because of the division made on decisions regarding:
  - Strengthening of infrastructure and
  - Management of Environmental Ports Policies.

- **TENECOPORT - Finished**: The main objective of the project is Improvement of the environmental management of the ecosystem in port areas of South East Europe

- **LOCATIONS - Ongoing**: Low Carbon Transport Plan for Cruise destinations, Locations is in full synergy with SUPAIR project especially relevant to the "Mobility Plan for DPA".

The strategic documents developed and produced by the above-mentioned projects, have been adopted and used as a strong reference point by the DPA.

KEY ISSUES, DRIVERS AND FACTORS AFFECTING PORT SUSTAINABILITY

Sustainability in maritime transportation systems is required to ensure safe, secure, efficient and reliable transport of goods while minimizing negative effects on the environment and maximizing resource efficiency globally. ESPO identifies and ranks a number of port sustainability issues with the aim of driving and prioritizing sustainable action plans. The last rank was released on November 2017. According to ESPO, although sustainability factors ranking depends on port geographical location, type of port activities and management and governance models, **air quality** has been representing the most important sustainability issue since 2013, given that more than 90% of EU ports are located close to urban areas and any improvement directly affects public health and quality of life of people. Starting from 2015, for instance, the low "Sulfur" areas (SECAS) have been implemented, thus generating huge benefits to the surrounding communities. Moreover, the global "Sulfur" cap on marine fuels has been confirmed. Additionally, the need to make ships complying with lower NO_x emission standards by 2021 is another top issue, which is being tackling with the NECA's. The second top port sustainability factor is **energy consumption** and this has been so since 2016. Energy consumption directly relates to carbon footprint and climate change. More broadly, the "climate change" issue includes energy efficiency and greenhouse gas emissions reduction and adaptation. Initiatives to reduce the carbon footprint in EU ports are of utmost importance and they could range from monitoring tools to investments in clean energy sources and decarburization strategies of the industries within the port.

Waste management is another issue, although it seems to have been less challenging in recent years (it was ranked at the top of sustainability issues back in 2004).

Durres Port Authority will aim to sustainability by focusing on three main issues and themes:

1. Environment and Surrounding Areas
    - Monitoring Air Quality and CO_2 emissions
    - Waste management and recycling activities
2. Port Hinterland Connections
    - Shift to low carbon transport modes
3. Energy Consumption
    - Use of renewable resources

A RECYCLING PLAN FOR A SUSTAINABLE PORT

Recently, Albanian citizens have started to raise awareness about waste minimization in the environment. We have to say that, unfortunately, for years, our government has not given priority to the creation of a regulatory plan for waste management. This continues even today with some improvements. These improvements have come because of the increase in the number of internet users where an important awareness role are social networks. When mentioning waste management, we refer also to waste coming from citizens, administrations, businesses etc. Durres Port is the largest and most important port in Albania. With an entry exit of 1 million and 700 thousand visitors in a year, it became one of the most important ports in the Balkans. With a staff of 450 employees, which includes only the West Terminal administration. Along with the other three terminals, the average number tripled. In Durres city, there are some important regional, local and national institutions where our co-operation is worth mentioning:

- Durres Municipality,
- Regional Council of Durres,
- Durres University (one of the largest universities in the country),
- Durres Prefecture,
- Albanian Railways,
- Archaeological Museum (the most important of its kind in the country).

All the institutions with their representatives are important stakeholders with whom we have continuous communication and support each other in their own initiatives and projects.

Recycling is a not often used in the institutional and daily terminology. There are no Special trainings in state administration and school and university curricula. The new generation through the internet has instant contact with any news or innovation using social networks initially and different office websites that are available and managed by relevant institutions. The purpose of our study is to create an awareness campaign based on our Port Authority. Our Campaign consists in raising awareness among our public administration and partners about the importance of

recycling and preserving the habitat, we live in. Our goal is to train all our staff on how and why we can recycle.

A MOBILITY PLAN FOR DURRES PORT AREAS

The purpose of this action is:

- To motivate employees to use bicycles and avoid daily use of the car.
- To build a bicycle parking lot.
- The construction of bike lanes in the Port Facilities.

The redesign of Durres Port parking spaces is one of the initiatives that the port intends to undertake. This will give the possibility of a soon implementation to our study. The use of e-biking and e-taxi has already started in the City of Durres with the initiative of the Municipality of Durres. In addition, the construction of bike lanes in the city has started and almost the entire central and beachside area of the city is being filled with bike lanes. The integration of these bicycle lines into the Durres Port facilities would simplify the use of them by the port authority staff. This action would avoid the use of cars, which are currently the widely used mode of transport of DPA staff. With the collaboration of DPA General Directory, we will create a set of questionnaires for the employee. We will collect the necessary information such as the number of workers using:

- Bikes
- Motorbikes/scooter
- Cars
- Public transport modes
- Walking to work

If the port will provide them the necessary conditions to switch using cars with the bikes, training sessions will be carried out to make sure that the staff will be aware also of the amount of money they can save by using bikes. The most important are the benefits to the quality of life. It can bring down air pollution in the environment where they work.

Figure 3 - Bike Line near Port of Durres Entrance

SWOT Analysis

Benchmarking Analysis

In order to have a clearer view we analyze the best practices of two main European port, Port of Rotterdam and Port of Antwerp. Then we compare those practices with the one we foresee to implement in the Port of Durres.

Environmental Challenge	*Port of Durres**	*Port of Rotterdam*	*Port of Antwerp*
1. Environment And Surrounding Areas	Revitalization of green spaces; recycling plan	Shipping index to incentivize green vessels	Technology to reduce air emissions; scrubber systems
		Green Awards program rewards ships for meeting best practices	LNG as alternative fuel for ships
		Infrastructure to make available electrical shore side power	
		Initiative to capture and store CO2 from CHEs in empty gas fields	
		Hybrid powered harbor crafts	
2. Water Quality		Assesses ecological risks and develops necessary corrective initiatives	
3. Energy and Others	Investments on solar panel power supply within Port Area		Installation of wind power
4. Port Hinterland Connections	Cycling/walking to work; modal shift	Cycling and walking; information panels	Accessibility to/from the port; modal shift monitoring

Table 1 - Comparison of Best Practices on Sustainability

*** Practices foreseen to be included in the action plan**

As we see in the above table even with this Action Plan, Port of Durres while will compare relatively well regarding issue 3 and 4, it still has a wide gap to make up in environment and surrounding areas and especially in Air Quality.

3. Stakeholder consultation

Focus Group Meeting

The stakeholders who participated in our Focus Group session have been informed previously about the project **SUPAIR**. The Stakeholders are linked to transport and environmental issues. Initially, the meeting was opened with the presentation of the **FOCUS GROUP** moderator who informed the interested parties about the suggestions Durres Port has regarding the solutions and studies that should be made for this project. Mrs. Celami presented our suggestions, for example, **a greener harbor** is an example of an ECO - friendly city for all the citizens and travelers. All stakeholders agreed that green spaces are a key element of a European city. In addition, Mrs. Celami suggested in the name of DPA the establishment of ecological and decorative containers for the recycle of waste in dividing Plastic/Paper/Glass. Our stakeholders have suggested that we can also collaborate with other businesses in the city to create the facilities for this study. The Municipality of Durres is partner in the SUMPORT project where their study focuses on **the construction of bicycle lanes in the city where the construction of such lanes in the Port of Durres would have a perfect fluidity with their study of the city transport system**. Another important issue for the Port of Durres was the discussion of **placement of wood-made information boards** across the entire port of Durres, consulting with two stakeholders representing private terminals was important. All port terminals should be agreed upon for the start of this study.

STAKEHOLDER CATEGORY	RELEVANT STAKEHOLDERS	INVOLVED IN THE FOCUS GROUP	CONTRIBUTION OF THE SUSTAINABLE AND LOW-CARBON PORT	
			NEEDS	IMPACT
PUBLIC REGIONAL AUTHORITY	DURRES MUNICIPALITY	**YES**	1. Establishing an e-biking rental. 2. Extend the E-Taxi services throughout the entire city.	Involvement: EASY Impact: LARGE
	REGIONAL COUNCIL OF DURRES	**YES**	1. Establishing info points with ecological material on the touristic pathway.	Involvement: EASY Impact: LARGE
PUBLIC NATIONAL AUTHORITY	ALBANIAN INSTITUTE OF TRANSPORT	**YES**	1. Contribute in Sustainable mobility plans. 2. Contribution on developing Improve of intermodality.	Involvement: EASY Impact: LARGE
	ALBANIAN ENVIRONMENT PROTECTION AGENCY	**YES**	1. Contribution on implementing the best practices of EU for the environmental protection in the port territory. 2. Developing of guidelines for the water management, air pollution etc.	Involvement: MEDIUM Impact: LARGE
	MINISTRY OF ENVIRONMENT AND TOURISM	**YES**	1. Contribute to improve accessibility for disabled low mobility passengers. 2. Contribute in adapting the national legislation.	Involvement: EASY Impact: LARGE
PUBLIC UNIVERSITIES	DURRES UNIVERSITY "Aleksander Moisiu"	**YES**	1. Collaboration in developing training courses about environmental issues derived by the port operations.	Involvement: EASY Impact: MEDIUM
PRIVATE – TRAVEL AGENCY	1. "ENGIN" 2. "PRAILA" 3. "FIORI TRAVEL AND TOURS	**YES**	1. Coordination in establishing an e-biking rental, connected to the DPA.	Involvement: DIFFICULT Impact: LARGE
PRIVATE TERMINAL OPERATOR	**AFTO,** Albanian Ferry Terminal Operator **EMS,** Bulk cargo terminal **DCT,** Durres Container Terminal	**NO**	1. Contribute in the extension of the bicycle lanes into the terminal, establishing of an e-bike rental station. 2. Placing a collection machine with protective nets, so that the grain residues do not spread to the city.	Involvement: DIFFICULT Impact: LARGE

Table 2 - Main results of the Port Stakeholders Consultation

4. Evaluation framework

- **The natural environment – *Revitalization of green spaces***

  - Revitalization, replacement, maintenance of green spaces in the territory of the DPA.
  - The green spaces of the Durres Port are divided into four main parts according to the following maps. Entrance 1, Entrance 2, (Entrance 3 – Pedestrian only), Entrance 4. The green spaces are filled by vases with flowers and trees.
  - Laying of ecological and decorative containers at the outer port facilities. We think these baskets are such as to help differentiate waste collection.

- ***Waste Management – A recycling Plan for a sustainable Port***

  - Revitalization, replacement, maintenance of green spaces in the territory of the DPA.
  - An initiative will be to provide trainings for the importance of recycling for the DPA staff and to expand it in a city level. Durres Port has 200 offices in its administration and 450 employees

- **Low carbon transport system – *A Mobility Plan for Durres Port Staff***

  - DPA has 450 employees in the administration only (excluding private terminals). The construction of bicycle parking lot in the DPA territory will bring ease in the use of environmentally friendly vehicles such as bicycles for all the employers. The use of bicycles will bring a reduction in air pollution. The promotion of their use by institutional workers in the region will reduce the overload of vehicles that damage the quality of the air.
  - Durres Municipality is engaged in the construction of bicycle lanes throughout the city and its provinces. This will facilitate the free movement of citizens by bicycle. Placing a parking lot for bicycles is important both for the development of ecological transport also to guide the citizens towards low carbon transport.

- **Clean Energy Investment – *Investment in Solar Panels within the Port Area***

  - Investments in solar panels within the Ports Areas.
  - Draft a long-term plan to shift to renewable energy sources and to convert all vehicles and machines that are used on port operations to electrical ones
  - Provide onshore power supply (OPS) to vessels at berth, rather than rely on electricity generated by their own (auxiliary) engines

SUSTAINABILITY GOALS	Specific Goals	ACTIONS	INDICATORS
ENVIRONMENT AND SURROUNDING AREAS	AIR QUALITY	Revitalization of Green Spaces.	1. Emissions (SO_X, NO_X, CO_2, particulates, dust) 2. Cleanliness index 3. No. of habitats and ecosystems
	WASTE MANAGEMENT AND RECYCLING ACTIVITIES	A Recycling Plan for A Sustainable Port.	1. Dock litter (empty cans, plastic, wood, et Recycle) 2. Waste quantity 3. Perceptions (surveys)
PORT HINTERLAND CONNECTIONS	SHIFT TO LOW CARBON TRANSPORT MODES	A Mobility Plan for Durres Port Staff.	1. DPA territory parking spaces allocated to bike users. 2. Nr of bicycle users 3. Perceptions (surveys)
ENERGY CONSUMPTION EFFICIENCY	USE OF RENEWABLE RESOURCES	Clean Energy Investment (renewable)	1. CO_2 footprint

Table 3 - Port of Durres Action Plan Indicators

5. Action plan solutions design

After the consultation with all relevant stakeholders in the below tables we identified the actions that are part of the Durres Action Plan. These actions and all respective measures were given an expected implementation timeline.

Table 4 - *Proposed Actions – Durres Port Action Plan*

Proposed actions	SUSTAINABILITY GOAL	Specific Goal	Strategy Concept
A. Revitalization of Green Spaces.	Environment and Surrounding Areas	Air Quality	The most directly noticeable part of shipping emissions takes place in port areas. Shipping emissions in ports can represent a substantial share of total emissions in the port-city interaction. Defines the goal to revitalize the Port Areas and add Green spaces.
B. Recycling Plan for a Sustainable Port.	Environment and Surrounding Areas	Waste Management	An adequate waste management in ports is crucial for minimizing negative environmental impacts. In addition, the steadily rising number of passengers and freight volumes also leads to larger quantities of waste produced.
C. Mobility Plan for Durres Port Staff.	Green Mobility	Staff Mobility Plan	A contract between the company and its employees, which aims at fostering the use of alternative green travel modes to private cars for commuting and professional trips.
D. Clean Energy Investment (renewable)	Energy Consumption Efficiency	Renewable Energy	Looking into the issue of sustainability as it applies to their facilities, vehicles and operational machines, based on many studies being conducted and plans being looked into cost-cutting measures on energy consumption.

Table 5 - Measures Implementation Timeline

Proposed actions / measures	Timeline				
	1 year	2 years	5 years	5 – 10 years	up to 15 years
A. Revitalization of Green Spaces.					
Divide the port in distinct areas, according to categories of functions				✓	
Revitalize the and create green areas within the port territory and nearby areas		✓			
B. A Recycling Plan for a Sustainable Port.					
Employee Environment training. Recycling Seminars	✓				
Waste fee reduction for sorted waste	✓				
Waste Management Plan	✓				
C. A Mobility Plan for Durres Port Staff.					
Establish the Company bus for peripheral resident commuters' staff	✓				
Foster beaver change to the bus public transport use, addressed to the City and peripheral resident commuters' staff (soft Measure)	✓				
Introduce carpool to the other city commuters' staff (Soft Measure)	✓				
D. Clean Energy Investment (renewable)					
Conversion of all port cranes and vehicles from diesel engine to electrical ones.			✓		
Installation of Photovoltaic Plant System. (Project Proposal Already Drafted)		✓			
On-shore power supply (OPS)					✓
Grand Total	**6**	**2**	**1**	**1**	**1**

A. Revitalization of Green Spaces.

SUSTAINABILITY GOAL: Environment and Surrounding Areas

Specific Goal: Air Quality

Port sustainability has three primary dimensions; environmental quality, economic prosperity, and social responsibility (Cheon and Deakin, 2010), which implies the need to navigate the balance between multiple variables such as coastal stewardess, communities, and facilitators of economic and logistics imperatives (Guglielmo 2000). Beyond compromising the ecological balance, ports and respective stakeholders are implementing sustainability initiatives to strengthen their brand as a form of competitive advantage in the industry they operate in (Galbraith et al., 2008).

Strategy Concept

Although most ship-related GHG, air and noise emissions take place at sea, the most directly noticeable part of shipping emissions takes place in port areas. It is here that shipping emissions have the most direct health impacts. Furthermore, shipping emissions in ports can represent a substantial share of total emissions in the port-city interaction.

The Action plan defines the goal to revitalize the Port Areas and add Green spaces.

Scenario "as is"

A green and clean port is well integrated with the city and with the initiative of the municipality to create a city with as many green spaces as possible. The DPA is interested to maintain the current green spaces and increase them will be part of our study.

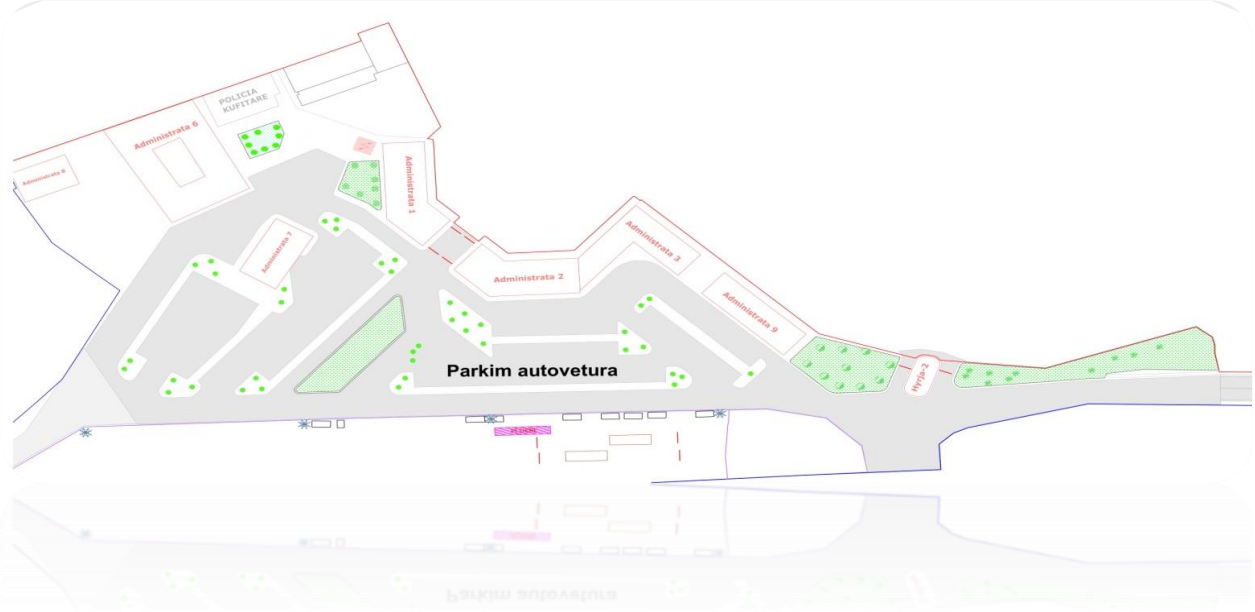
Table 6 – Air Monitoring Data

No	*Parameters*	*Unit*	*Norm*	*EU Norms*	*2016*	*2017*	*2018*
1	Particles (PM10)	µg/m3	150	40	62.6	40.6	43.2
2	Benzene (C6H6)	µg/m3	5	5	4.0	4.1	4.3
3	Nitrogen Dioxide (NO2)	µg/m3	250	40	8.6	12.0	16.6
4	Sulfur Dioxide (SO2)	µg/m3	500	125	48.4	48.6	49.7
5	Carbon Dioxide (CO2)	ppm	1000		560.7	509.4	517.0

*The norms are based on the reports of the National Environment Agency

Current Green Spaces are distributed as follows in the maps below:

Entry nr.1: Palm Trees & Ilex Quarks Trees



Entry nr.2: Palm Trees

Entry nr.3:
Palm Trees

Washingtonia Robusta

Roses

Existin green spaces and vegetation:

WASHINGTONIA ROBUSTA CHAMAEROPS HUMILIS CHAMAEROPS EXCELSA

The Overall Objective:

The relationship of the city with its port strongly influences the development of port function, urban renewal and the port–city system as a whole; for this it plays a key role in the action we propose.

The overall objective is to revitalize the green areas that connect the port to the city and to create new areas that will function as "Port tourism". Also, this will improve the quality of environment in the port and its surrounding areas.

Work Plan

Table 7 – Description of proposed action and timeline

Specific objective	*Measures*	*Actors / Stakeholders*	*Role and Responsibilities*	*Time*
Increase air quality by adding green areas and improving the surrounding areas	Revitalize the existing green areas and create new green areas within the port territory	Durres Port Authority	Increase the "green areas", at least by 50%	2 years
	Divide the port in distinct areas, according to categories of functions	Durres Port Authority	The main gate area must be freed from the Customs border and have destinations such as to enable the "urban" use of the yards and docks and the establishment of an appropriate waterfront, in order to improve the integration port/urban area.	5 – 10 years

Scenario "to be"

The main entry of Port of Durres, within a municipality project is going through major renovation and also has been defined as a pedestrian area only. The DPA in collaboration with the municipality will renovate and increase the green spaces in this area. The focus will be on pedestrian comfort and integrating the port/urban area, to function as a "green pedestrian park".

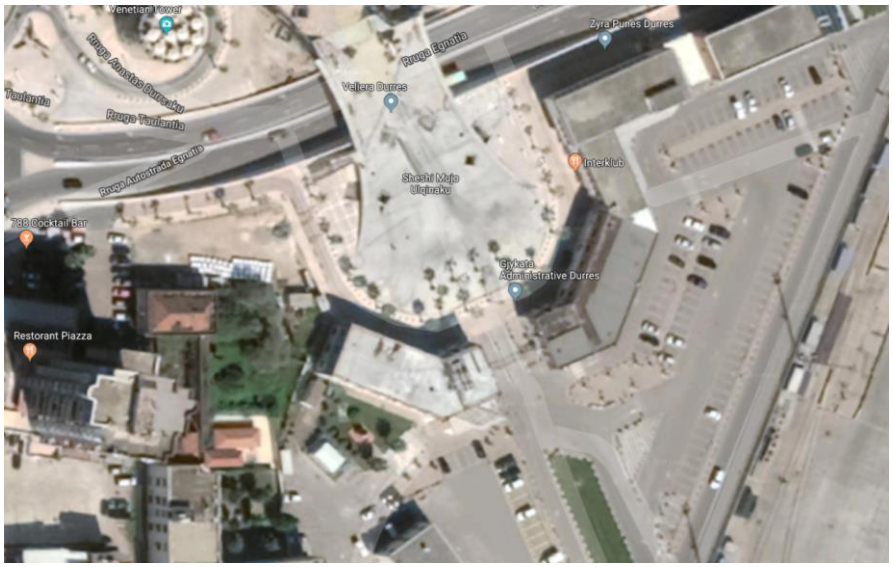


Figure 4 - Port of Durres Main Entrance

The main areas identified to create **new green areas** are The Western Terminal and The Eastern Terminal.

Eastern Terminal Intervention

Figure 5 - Eastern Terminal

The eastern terminal is where all bulk cargo are handled. As seen in the above photo green spaces are no existing and the air quality and pollution is the most problematic of the port territory. The DPA in collaboration with the municipality and terminal operator will create a new green park along the beach side of the terminal and a water front will be constructed in a later stage. This intervention will reduce the pollution especially reducing the Particles (PM10) inquination.

Western Terminal Intervention

Figure 6 - Western Terminal

According to the Master Plan of Port of Durres the western terminal is foreseen to be transformed in yacht marina from the outside. In the sense the plan envisions the construction of a water front. To further enrich the plan DPA authority in collaboration with the municipality will create a new park along the shore and partly inside the port territory. This area is very close to the urban center of Durres City, therefore the plan is to better integrate the port/urban territory. The realization of the "green park" will try to attract "urban tourist" to walk, cycle and enjoy this part of the shore that until now is not accessible. Together with the Yacht Marina and the Cruise Terminal that are foreseen to be constructed, this urban area will go through a major restoration and revitalization. The area will then be connected to the already existing "VOLLGA AVENUE" waterfront, contributing to almost double the walking, cycling and green pathway of the city.

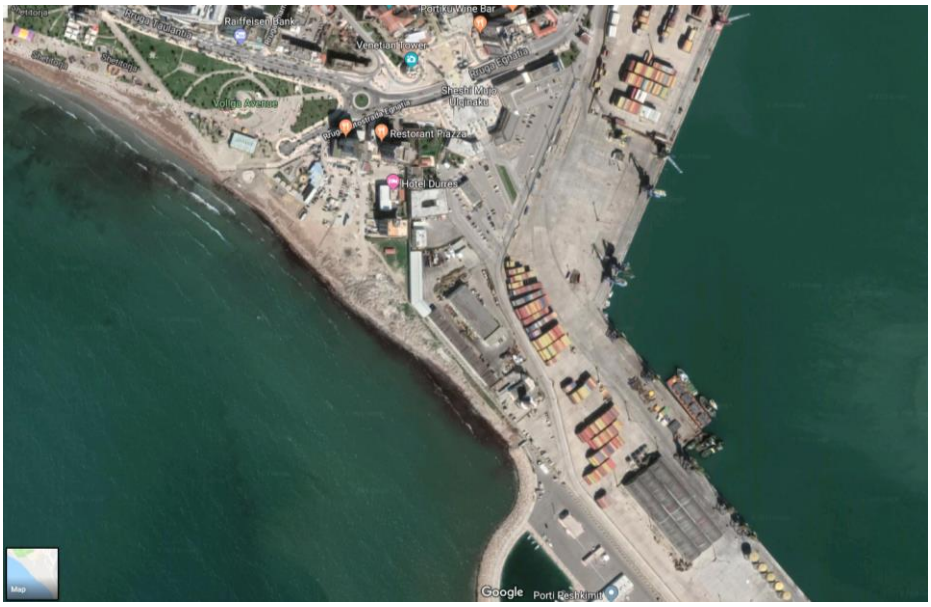


Figure 7 - Google View, Distance from Western terminal to Vollga Avenue

B. A Recycling Plan for a Sustainable Port.

Strategic Concept

Although ports are a vital part to the engine of an economy, they are also locations that harbor environmental and social pollution originating from land, ships and port machinery activities. This has led to the provision of sustainable development policies/legislation for ports both globally and locally that aim to incorporate environmental issues into core strategies and operations of port development.

An adequate **waste management** in ports is crucial for minimizing negative environmental impacts. In addition, the steadily rising number of passengers and freight volumes also leads to larger quantities of waste produced.

According to MARPOL 73/78 and the EU Directive 2005/59/EC ports are obliged to provide adequate port reception facilities which must be adequate to meet the needs of ships using the port, without causing undue delay. The EU Port Reception Facility (PRF) Directive also requires:

- Vessels to land the waste they produce during voyages to and between ports to port reception facilities;
- Ports to develop waste handling plans; and
- Vessels to pay a mandatory fee for landing this waste and to notify the port of what waste it has in advance of arriving in port

Scenario "as is"

Within the port policy of "Environmental Management of Durres Port Authority", the port aims to obtain certificates **IS0 9001** and **IS0 14001**. Among other specific objectives the ports will asks all operators the:

- Reduction of waste through the re-use and recycling and also promoting the use of recycled materials as much as possible;

Waste management in the port is currently handled by to private operators each with its own specific task. As of the present no special policy is being followed to encourage the reuse and recycling and disposal of wastes applied across the port sites. Their main activities are:

- Collection, selection, manipulation of solid residue.
- Collection, separation of liquid residue.
- Repairs on boats and ferries.
- Industrial laundry
- Water supply for ships and ferries.

Nevertheless the DPA is working to draft and implement a new Waste Management Plan.

The Overall Objective:

As a port having environmental services (since 2004), the first action of Port is to implement an extensive environmental policy with a rigorous appraisal procedure for all new projects. Further, to identify any potential risk to the natural environment, the Port conducted a full environmental audit of all marine facilities.

In general, the **disposal of waste should always be the last option** and waste should always be recycled, if possible. Against this background, one of the DPA main goals is to **increase the recycling rate** of vessels/ships/cruise port terminals and **improve the waste management system**.

Work Plan

Table 8 - Description of Proposed Action and Timeline

Specific objective	*Measures*	*Actors / Stakeholders*	*Role and Responsibilities*	*Time (months)*
Increase the recycling rate and improve the waste management system	Waste Management Plan	Durres Port Authority	Produce a document unifying the policy on waste reception facilities for vessels and outlining the facilities available at the location, fulfilling all the requirements of domestic and international regulations.	Within 10
	Waste fee reduction for sorted waste	Durres Port Authority; Terminal Operators	Reduced waste fee offered for vessels which sort the waste on board.	Within 12
	Employee Environment training. Recycling Seminars	Durres Port Authority; Terminal Operators	Creating a "green mind-set" of the employees through short training sessions.	Within 10

Scenario "to be"

a) Waste Management Plan

A Port Waste Management Plan (PWMP) is a document produced by the port and/or the terminal operators unifying their policy on waste reception facilities for vessels and outlining the facilities available at the location. This plan should demonstrate that they are fulfilling all the requirements of domestic and international regulations and that the facilities and infrastructure is available to meet the needs of vessels normally using the port/terminal without causing undue delays.

The Plan shall also include:

- a summary of relevant legislation and formalities for delivery;
- identification of a department or departments to be responsible for the implementation of the waste management plan;
- a description of the pre-treatment equipment and processes in the terminal;
- a description of methods of recording actual use of the waste reception facilities;
- a description of methods of recording amounts of prescribed wastes received; and,
- A description of how the prescribed wastes are disposed of.

The plan after consultation with all relevant stakeholders, should be subject to Durres Port Board approval, thus making it **compulsory to be followed** by all private operators and public institutions that "do business" in the port area.

b) Waste Fee Reduction for Sorted Waste

Reduced waste fee can be offered for vessels which sort the waste on board, as practiced in the Port of Tallinn or the Port of Stockholm. This would encourage shipping lines to introduce a sorting system on board (if not already in place) and increase the efficacy of the resource disposition of the waste disposal companies. An example of this approach is followed by the Port of Helsinki where vessels are granted a 20% fee reduction for waste disposal if they also dispose of their wastewater.

In the Port of Durres we propose the fee reduction to be 15% (further review may be needed) to all vessels that sort the waste on board. This measure will enter in force shortly after the approval of the Port of Durres Waste Management Plan.

c) Employee Environment Training

The focus of this measure will be on training all port employees through short sessions on a “green mind-set”.

All employees will be divided in categories based on their working positions and areas and participate in short training session on:

A) Port Administration Staff
    1. Recycling of all “office waste”
    2. Green and Clean Working Spaces
    3. Use of Recycled Materials
B) Terminal Operators Staff
    1. Green and Clean Working Spaces
    2. Use of Recycled Materials
    3. Waste Management Plan
    4. National and EU Legislation Requirements for Waste Management
C) Waste Handling Private Operators
    1. Waste Management Plan
    2. National and EU Legislation Requirements for Waste Management

Another proven means to involve employees into the process of striving towards environmental sustainability is to introduce an employee suggestion system. Awards for bringing in ideas with a high impact on environmental sustainability can further promote participation and increase employees’ motivation. Thus, after the conclusion of the seminars a system should be created and maintained in time to receive as much as possible employee feedback and ideas.

C. A Mobility Plan for Durres Port Staff

Strategic Concept

The company travel plan is a contract between the company and its employees, which aims at fostering the use of alternative green travel modes to private cars for commuting and professional trips. The plan relies on concrete measures and an involvement of employees. This is a long-term management strategy to promote more sustainable transport amongst staff, visitors and deliveries to the port. This can simultaneously bring about a number of benefits such as a reduction in associated CO2 emissions, cost savings, reduced congestion and improved health through active travel so that both employers and employees truly benefit.

The mobility plan addresses a variety of different travel types to and from the Durres port, but one of most important is

- Travel undertaken by staff

Scenario "as is"

From the analysis of the current situation referring to the indicative data as well as the statistics of Human resources sector of that the DPA, results:

1. ***Total number of Employees include private terminals operators is approximately 862***

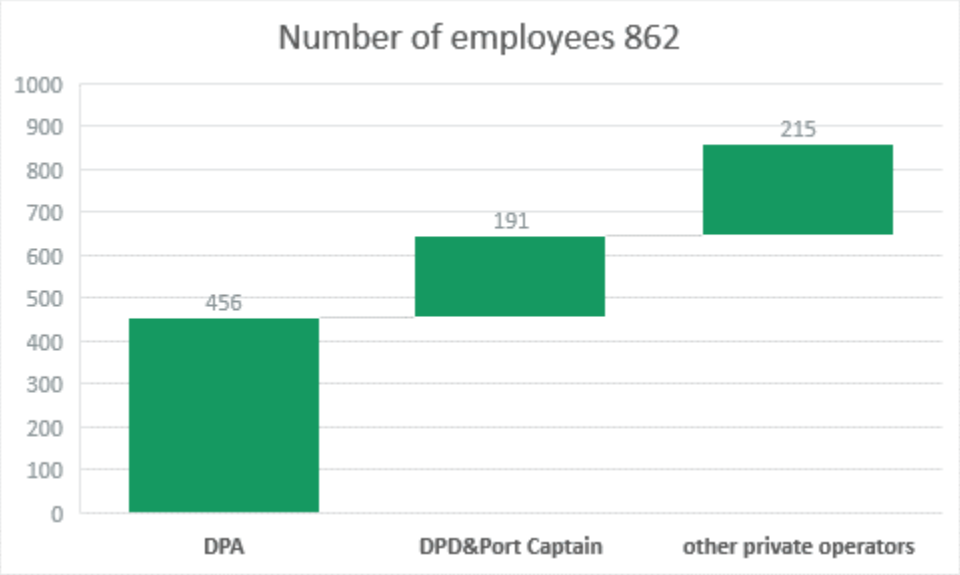


Figure 8: Total number of employees

2. ***Only 44% of total employees have their residence within the Durres City the other's residence is peripheral zones of Durres and in the other cities.***

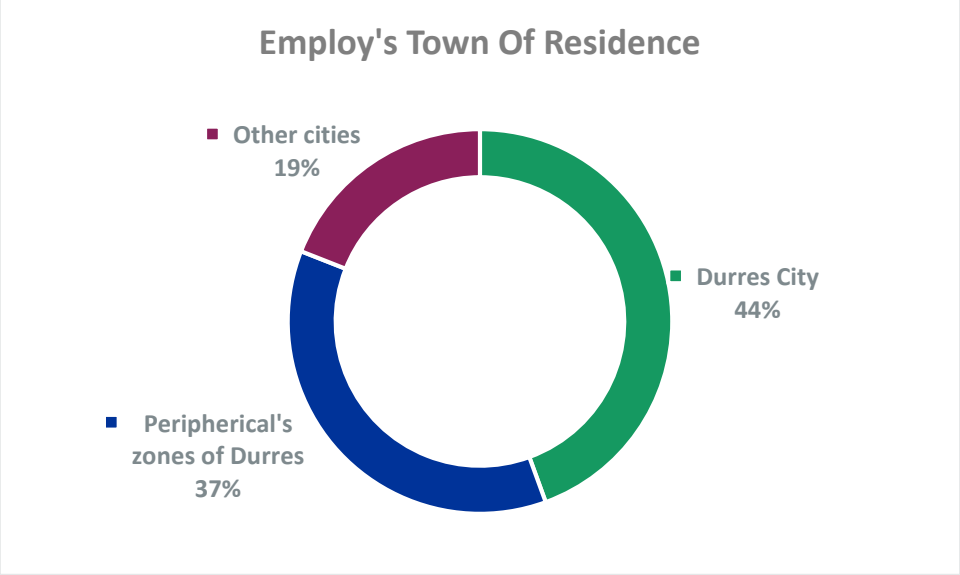


Figure 9 - DPA Employers Residence Graphic

3. ***As about "Modal shift" of home to work travel, result that only 40% of staff using green transport modes.***

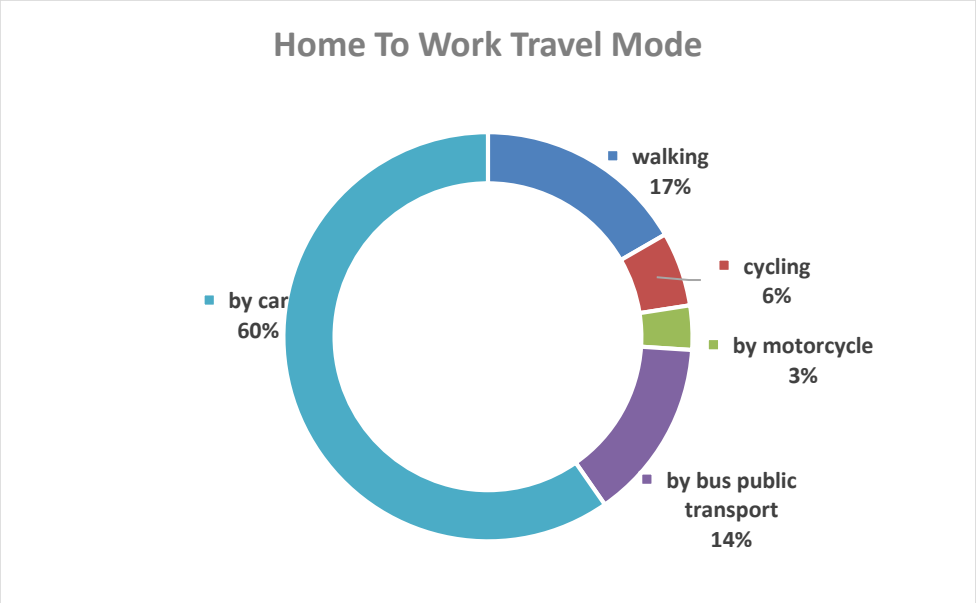


Figure 10 - Transport Modal Share

Work plan

Overall objective:

The overall objective of travel plan is to increase shift to the green transport modes from 40% to 58% within next 3 years, by reducing the private car use by staff commuters from 60% to 42%.

The main attention to the achievement of the overall objective will be measures to ensure the growth of bicycle trips and public bus transport by the Durres port staff.

Table 9 – Action Plan Description and Timeline

Specific objective	*Measures*	*Actors / Stakeholders*	*Role and Responsibilities*	*Time (months)*
Increase to 21% of collective transport commuters staff trips	Foster beaver change to the bus public transport use, addressed to the City and peripheral resident commuters' staff (soft Measure)	Durres Port Authority	Foster the staff using bus public transport	within 6
		Durres Municipality	foster private operators to improve the quality of service	within 12
		Private Port Operators	Foster the staff using bus public transport	within 6
		Private public transport providers	Improve the reliability and quality of service	within 12
	Establish the Company bus for peripheral resident commuters' staff	Durres Port Authority	Provide 2 bus company and approve the time and bus stops or	within 12
			Service Contract with private bus companies	within 6
	Introduce carpool to the other city commuters' staff (Soft Measure)	Durres Port Authority Durres Municipality Private Port Operators	Establish the carpool web-platform	within 12

Table 10 - Action Plan for Specific Objective Description and Timeline

Specific objective	*Measures*	*Actors / Stakeholders*	*Role and Responsibilities*	*Time (months)*
Increase to 22% of commuters staff walking trips	Foster beaver change of commuter's trips, addressed to the residents within 3km distance	Durres Municipality	Improve the pedestrian walk side	within 12
		Durres Port Authority	reduce the car parking permissions within the port area	within 6
	Establish Bicycle parking lots near workplace within the Port area	Durres Port Authority	invest for parking lots within the Port area, near to the administrative offices of DPA and to the terminals	within 12
Increase to 11% of cycling commuters staff trips	Set up the bicycle lines within the port area	Durres Port Authority	Invest for bicycle lines	within 12
	Foster beavers change of commuters and professional trips to shift to the bicycle. (Soft measure)	Durres Port Authority		within 12

Scenario "to be"

In the figure below is shown the graph of modal shift of Scenario "to be" comparing with "as is"

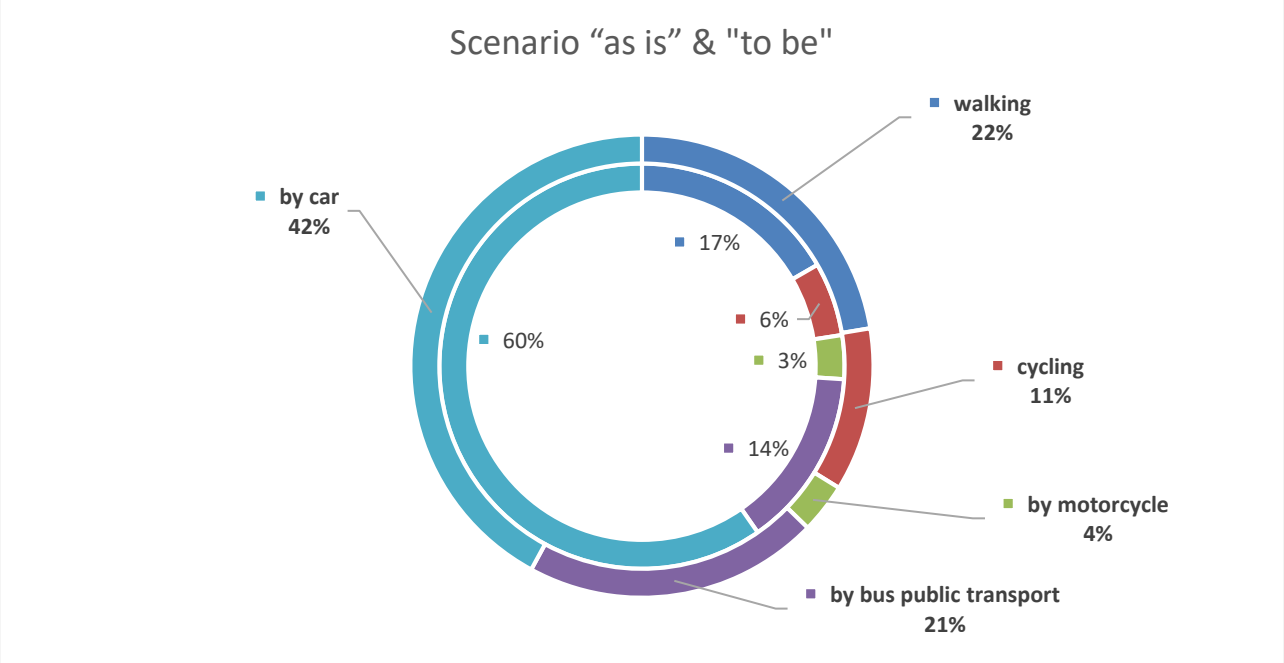


Figure 11 - Modal Share Comparison Before and After Measure Implementation

Reasons for launching the port mobility plan

PARKING MANAGEMENT: Durres Port Authority has insufficient car park spaces for its employees and wishes to optimize parking use.

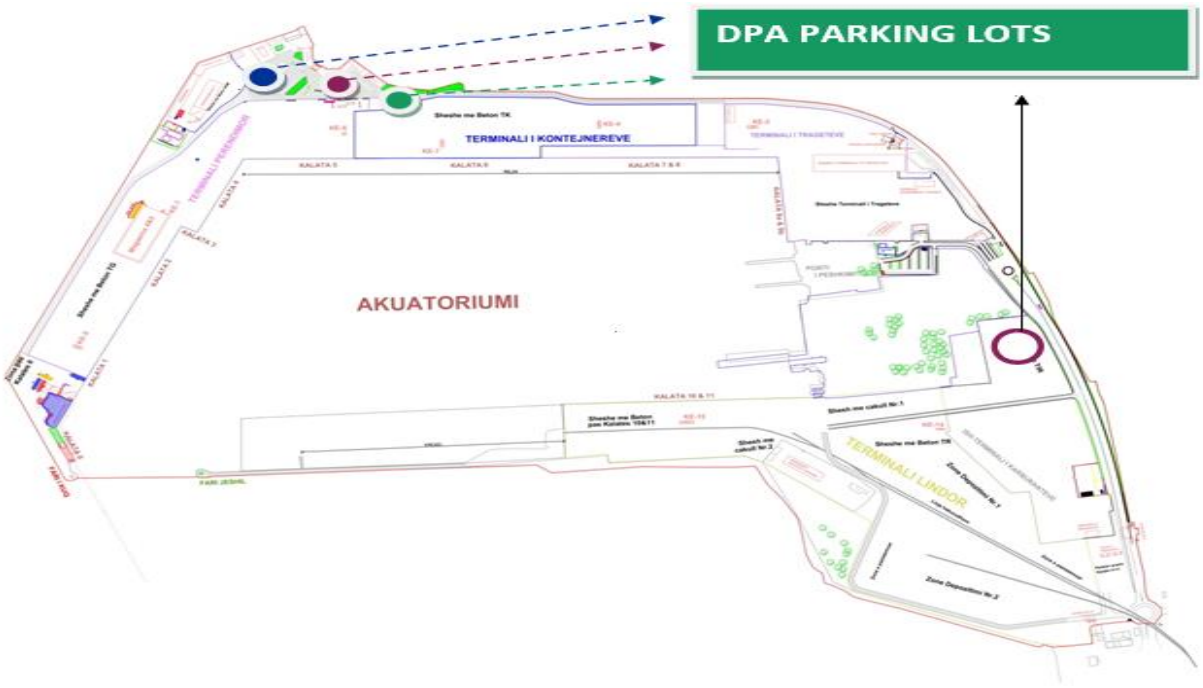


Figure 12 - Parking Areas inside the Port Territory

At the moment there are about 2,500 automobile permits for one-year period (including administration), which go in and out of the port several times a day.

The number of additional car permits (for 24 hours) given to the visitor, customers and private companies during the last 4 months, is 5,265.

As above, the Port is faced with a misbalance between the offer and supply of car parking space.

COST REDUCTION: Durres Port Authority purpose is to cut costs, in particular the budget allocated for maintenance of parking spaces.

Durres Port Authority wishes to optimize business travel costs for employees using their private car, or reduce expenses linked to service vehicles.

IMPROVING EMPLOYEE HEALTH AND QUALITY OF LIFE: Durres Port Authority wishes to improve the working conditions and the well-being of its employees and decrease travel-induced stress.

RAISING AWARENESS OF ENVIRONMENTAL ISSUES: Durres Port Authority is committed to an environmental management approach and wishes to rationalize the use of cars.

A carbon assessment or a quality policy with a view to certification is in progress to improve the company's image.

Facilities for new mobility practices

The presence of amenities at the workplace, such as a kitchen, cafeteria and crèche, reduces the number of journeys made by employees and improves their comfort. The provision of facilities (lockers, changing rooms, showers) encourages the use of alternatives to the car and has major benefits for employee health and the environment.

D. Clean Energy Investment (renewable)

SUSTAINABILITY GOAL: Energy Consumption Efficiency

Strategic Concept

Renewable energy is energy that is collected from renewable resources, which are naturally replenished on a human timescale, such as sunlight, wind, rain, tides, waves, and geothermal heat. Improved energy efficiency is an important issue at major ports across the globe. At many of these ports, outdated land-based power grids aren't keeping up with the increased demand of the cargo flow. There is also the environmental impact to consider, as carbon-emitting fuels are proving to be a detriment to the surrounding areas and to the planet at large.

Right now, most ports are looking into the issue of sustainability as it applies to their facilities, vehicles and operational machines. There are many studies being conducted and plans being looked into. There are already a handful of ports that are taking the lead in regards to cost-cutting measures on energy consumption.

Following this trend, the Durres Port Authority has planned a considerable investment in clean energy, with the aim to shift part of the Port energy consumption in to renewable energy. The ports aim is to install a photovoltaic plant system inside the port area.

Scenario 'as is'

Durres Port Authority is one of the greatest energy consumers in the region of Durres. And all energy is purchased from the national grid.

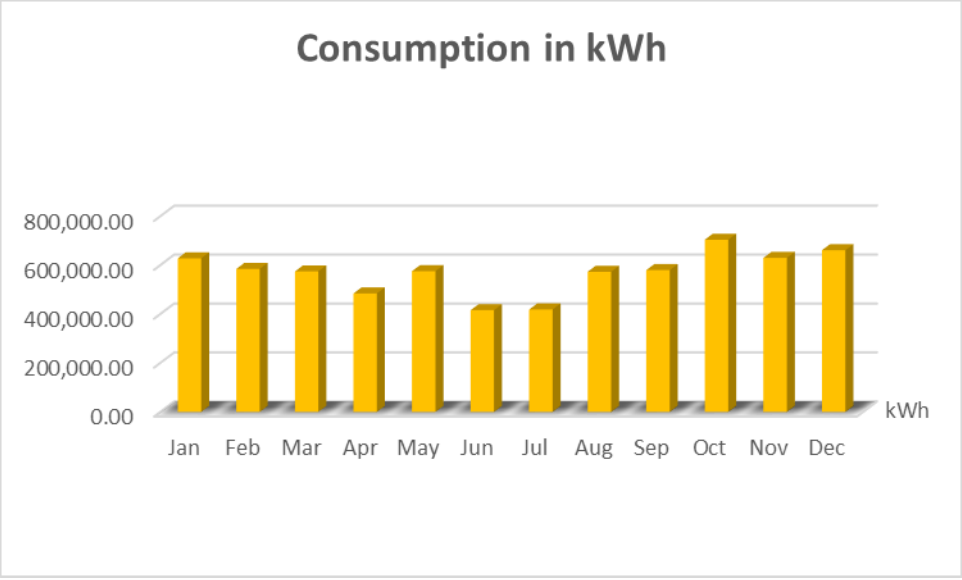


Figure 13 - Energy Consumption by DPA, Year 2018

Draft The work plan

Overall objective

The DPA main objective is to shift by 2030 50% of the electric energy consumption to renewable energy sources.

The **first step** will be the installation of photovoltaic plant system in the port areas. In terms of ease of installation and maintenance, PV is clearly the most convenient way to generate renewable electric energy. It is worth noting that sufficient space needs to be available (e.g. on roofs) and the technical and economic feasibility is case dependent.

The **second step** will be to convert all port operations based on fuel in to electric vehicles.

Step three will be to invest more in other renewable energy sources (ex. Solar, Wind, Tides, Waves etc...)

Step four will be to provide onshore power supply in all terminals. Onshore power (OPS) is one possible technology to avoid GHG, air and noise pollutions from (cruise) vessel located at berth. This stationary technology allows vessels at berth to use shore power rather than rely on electricity generated by their own (auxiliary) engines that emit GHG and air emissions, affecting local air quality and ultimately the health of both port workers and nearby residents.

Table 11 – Action Description and Timeline

Specific objective	*Measures*	*Actors / Stakeholders*	*Role and Responsibilities*	*Time (years)*
Shift 50% of energy consumption to renewable energy sources.	Installation of Photovoltaic Plant System. (Project Proposal Already Drafted)	Durres Port Authority	First Financial Investment. Define the areas where the solar panels will be installed.	within 1
		Private Operator	Service Contract for installation of the photovoltaic plant system.	within 2
	Conversion of all port cranes and vehicles from diesel engine to electrical ones.	Durres Port Authority	Convert all port vehicles and machines to electric ones.	within 5
	On-shore power supply (OPS)	Durres Port Authority	Provide the technology that allows vessels at berth to use shore power rather than rely on electricity generated by their own (auxiliary) engines.	From 10 to 15

Scenario "to be"

a) Project Proposal - Installation of Photovoltaic Plant System (source of study DPA)

PROJECT LOCATION: Durres Port Authority
SURFACE: 26,814.70m2 (25,098.40m2 the surface of parking)
PROPOSED CAPACITY: 5,134.61 KWP

The project proposal has foreseen to install the plant system in three different zones.

I. Zone 18 (Administrative Building Roofs)
II. Zone Parking Space 1
III. Zone Parking Space 2

I. Zone 18 PV System Proposal

Table 12 - General Information

System Information	Cost Estimation
Installed Power - 1,027.40 KWP	Value of Investment for PV System (750€/KWP)– € 770,546.25
Annual Production - 1,361.00 KWH/KWP	Value of Investment for Parking Structure (80€/m^2)– € 182,460.00
Parking Surface – 3,649.20 m^2	Total Value of Investment for Zone 18 – € 953,006.25
PV Generator Energy (AC grid) - 1,398,284.60 kWh/year	Total Surface – 5365.5 m^2
PV Modules (n_0 – 2601 pcs)	PV Inverters – 19pcs
CO_2 emission avoided – 839,409 kg/year	Needed trees to absorb this CO_2 - 21,547 pcs

Figure 14 - Satellite view of zone 18 projected PV

Figure 15 - Angled Image of zone 18 projected PV

II. Zone Parking 1

Table 13 - General information

System Information	Cost Information
Installed Power - 1,718.25 KWP	Value of Investment for PV System (750€/KWP)– €1,288,687.50
Annual Production - 1,388.38 KWH/KWP	Value of Investment for Parking Structure (80€/m^2)– €717,840.00
Parking Surface – 8,973.00 m^2	Total Value of Investment for Parking 1– €2,006,527.50
PV Generator Energy (AC grid) - 2,385,583.94kWh/year	Total Surface – 8,973.00 m^2
PV Modules (n_0 – 4350 pcs	PV Inverters – 22pcs
CO_2 emission avoided – 1,431,350kg/year	Needed trees to absorb this CO_2- 36,742pcs

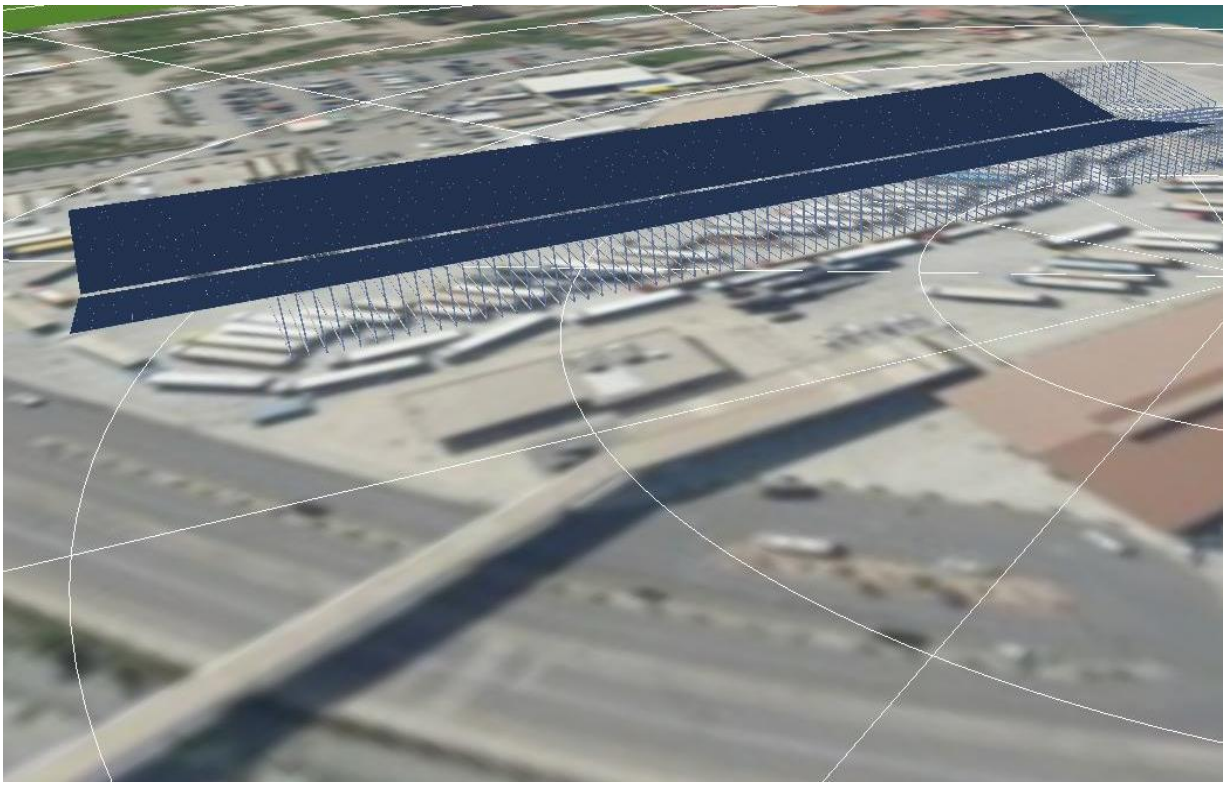


Figure 16 - Zone Parking 1 PV Projection

III. Zone Parking 2

Table 14 - General Information

System Information	Cost Information
Installed Power - 2,388.96 KWP	Value of Investment for PV System (750€/KWP)– €1,791,720.00
Annual Production - 1,396.60 KWH/KWP	Value of Investment for Parking Structure (80€/m^2)– €998,096.00
Parking Surface – 12,476.20m^2	Total Value of Investment for Parking 2– €2,789,816.00
PV Generator Energy (AC grid) - 3,334,276.78kWh/year	Total Surface – 12,476.20bm^2
PV Modules (n_0 – 6,048 pcs	PV Inverters – 31 pcs
CO_2 emission avoided – 2,000,560.00kg/year	Needed trees to absorb this CO_2- 51,354 pcs

Figure 18 – Satellite view on Zone Parking 2 PV Projection

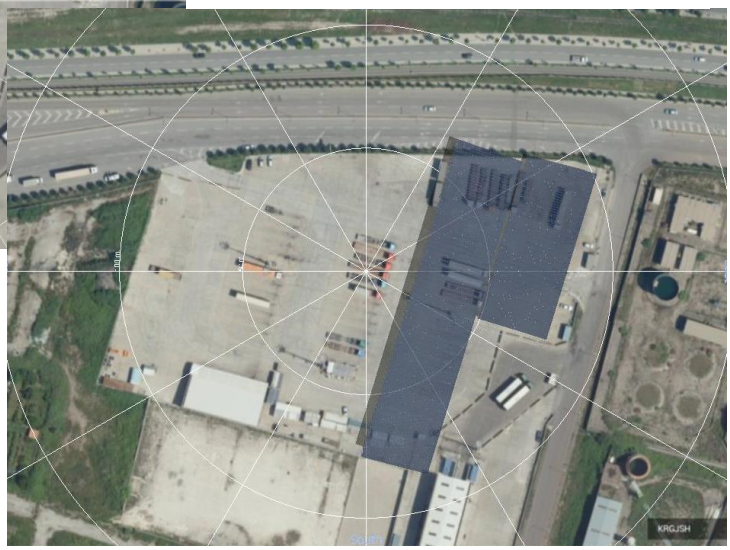


Figure 17 – Satellite view on Zone Parking 2 PV Projection

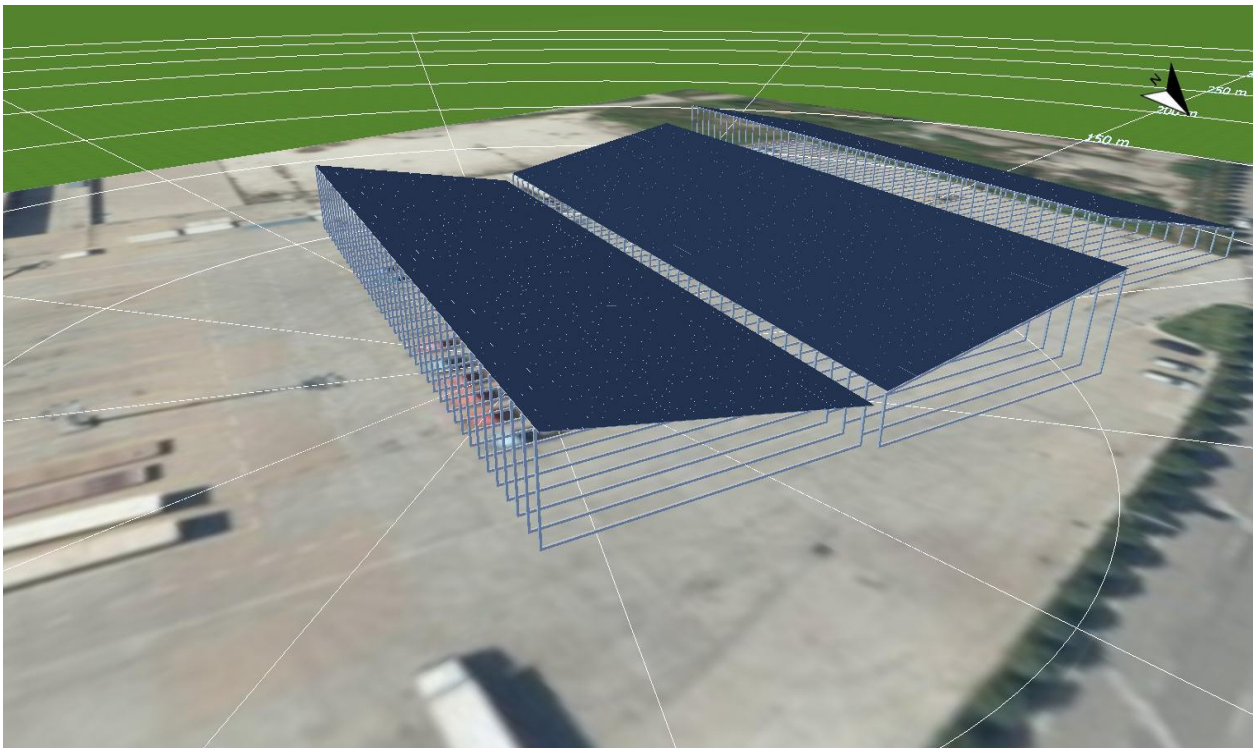


Figure 19 - Angled Image of Zone 2 projected PV

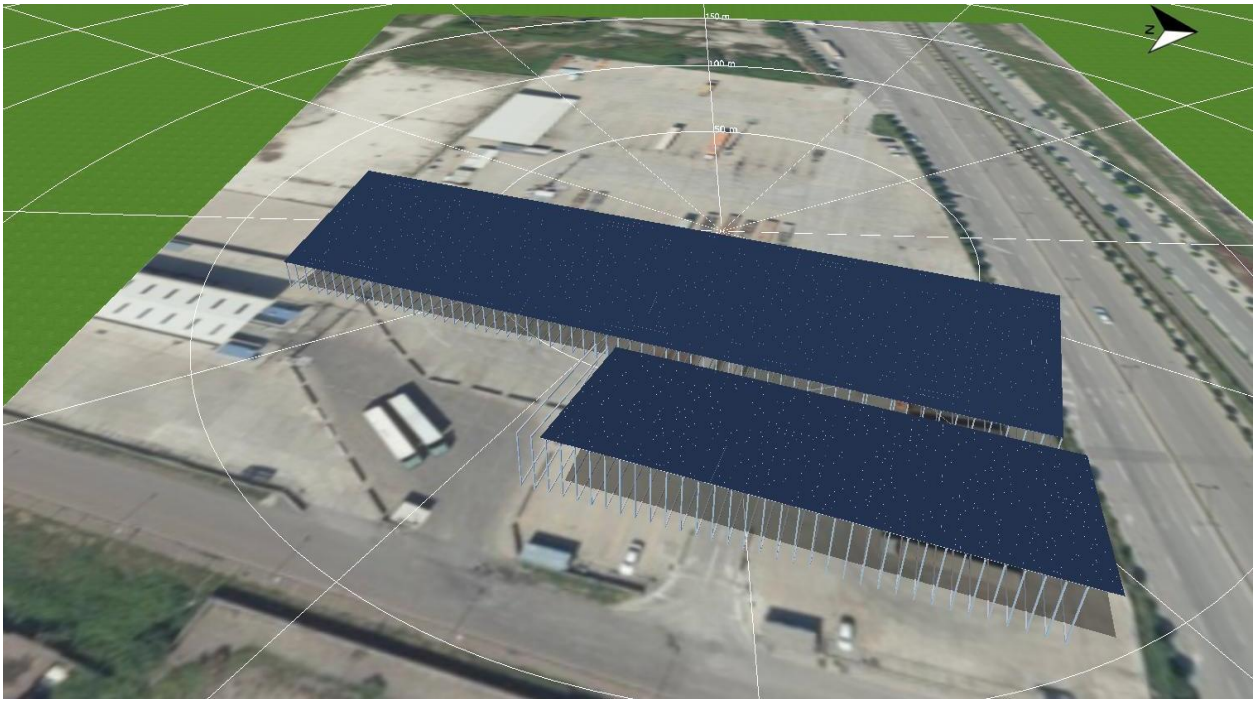


Figure 20- Angled Image of Zone 2 projected PV

System Performance Summary

Table 15 - General Summary

System Information	Cost Information
Installed Power - 5,134.61kWp	Value of Investment for PV System (750€/kWp)– €3,850,953.75
Annual Production - 1,385.64kWh/kWp	Value of Investment for Parking Structure (80€/m^2)– €1,898,396.00
Parking Surface – 25,098.40m^2	Total Value of Investment – €5,749,349.75
PV Generator Energy (AC grid) - 7,118,145.31kWh/year	Total Surface – 26,814.70m^2
PV Modules (n_0 – 12,999 pcs	PV Inverters – 72 pcs
CO_2 emission avoided – 4,271,319.00kg/year	Needed trees to absorb this CO_2- 109,644pcs

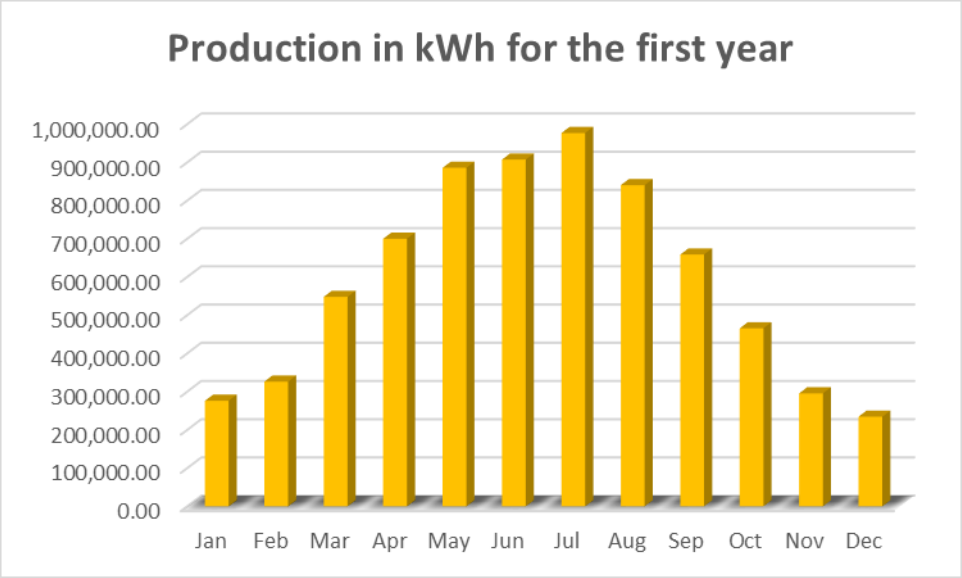


Figure 21 - Expected Energy Production from PV, Year 1

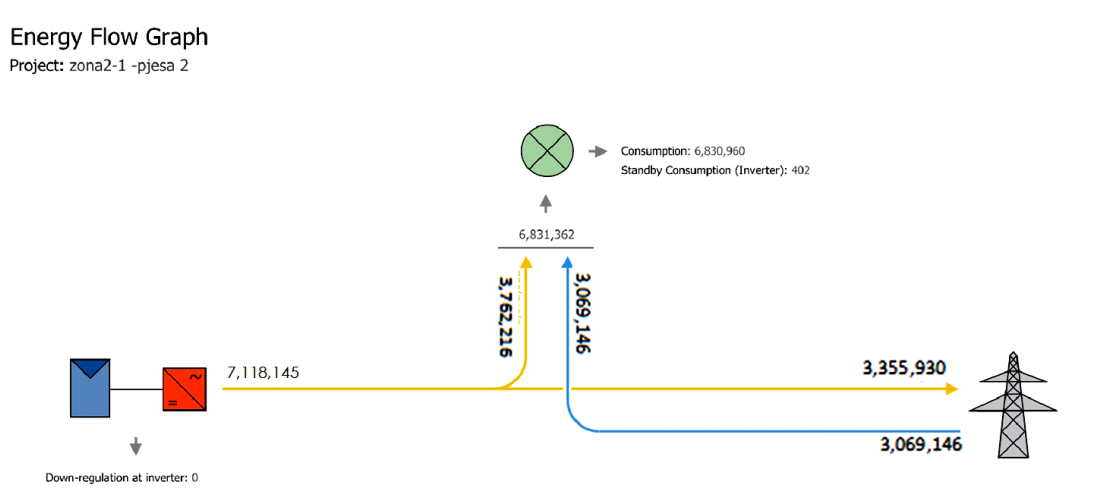


Figure 22 - Energy Flow Graphic

Annual savings of PV system

From the estimated annual production output, the total value of the savings is calculated to be around **€338,599.40** that are obtained from the energy used only for Net-Metering.

Over the years, the value of saving tends to increase as the electric utility rates are expected to rise 2% a year. Over 26 years, the annual utility savings are anticipated to average **€338,599.40 / year**. In the 26th year, the cumulative value of Cash-Flow will reach the value of **€11,677,539.20** which serves also as an indicator for investment appraisal.

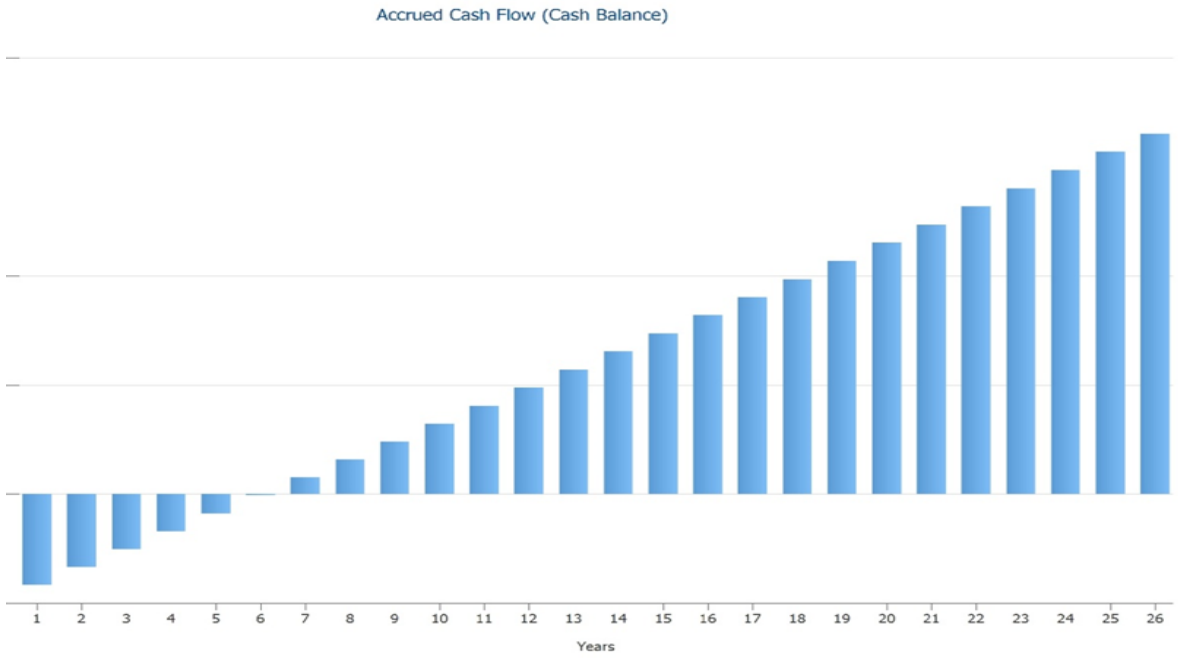


Figure 23 - Cash Balance Estimation

b) Convert all vehicles and machines that are used for port operations in to electric ones

Port equipment for load/unload/movement of freight that should be replaced with EV.

- ***Equipment on ferry terminal***

3 Towing Heads MAFI
1 Towing Head SCANIA
1 Lifter

- ***Equipment for handling the containers on containers terminal***

REACHCTACKER

Forklift	*(16 tons)*	*2 items*
Forklift	*(32 tons)*	*2 items*
ECH	*(7 tons)*	*1 item*
Trailers	*(100 tons)*	*5 items*
TYRE crane		*1 item*

- ***On eastern terminal for transitory use.***

GRIFERA *25 items*

- ***On western terminal for handling general cargos***

GREJFERA	*(5 -10 tons)*
Auto cranes	*(45 tons)*

As seen in the above list all equipment should be replaced with Electrical Vehicles this will contribute to reduce the GHG emissions considerably.

Figure 24 - Port of Durres Load/Unload Equipment

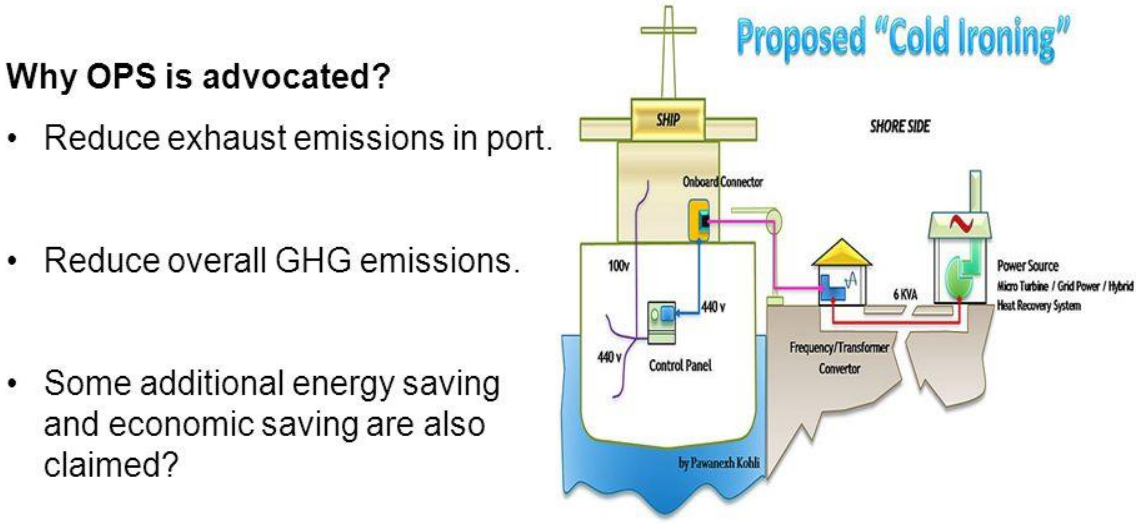
Figure 25 - Port of Durres Cranes

c) On shore power supply (OPS)

Onshore power (OPS) is one possible technology to avoid GHG, air and noise pollutions from (cruise) vessel located at berth. This stationary technology allows vessels at berth to use shore power rather than rely on electricity generated by their own (auxiliary) engines that emit GHG and air emissions, affecting local air quality and ultimately the health of both port workers and nearby residents. While local air emissions can nearly be eliminated, the actual GHG emission reduction potential depends on the electricity generation mix of the grid. According to SLR Consulting Australia Pty Ltd (2017), shore-based power, as an alternative to on-ship power, would also result in a noise reduction of up to 10 dB(A). Economic issues are the largest challenge of OPS. First of all, high investment, between 5 and 25 million € per installation, are required to realize OPS in ports, mainly related transformer stations, frequency converters, cable management systems and grid extension. Furthermore, suitable equipment on ships is required, such as connection panel and control systems or on-board transformers, ranging from 300,000 – 1.75 million € per vessel, depending on type and size. Finally, the profitability is strongly dependent on local electricity and fuel prices as well as on the number of calls per year. Mobile facilities are also possible but much more expensive to establish and operate than stationary OPS facilities.

The actual GHG emission reduction potential from onshore power supply depends upon the **energy generation mix of the local grid**. Since the national energy generation mix is still very dependent on hydro power plants and after the **Installation of Photovoltaic Plant System** the implementation of OPS in the Port of Durres is expected to have a high impact on the reduction of GHG emissions considering the fact that **50% of the port energy is expected to be obtain through renewable energy sources**.

Figure 26 - Schematic OPS Deployment



6. Actions and solutions deployment

A. Revitalization of Green Spaces.

The port-city relationship

Each port city has its distinctive feature that depends on city size and port traffic and pattern; for this, the relationship between a city and its port evolves over time. The so called "ANYPORT Model" (Bird, 1963) already shows urban expansion and port specialization.

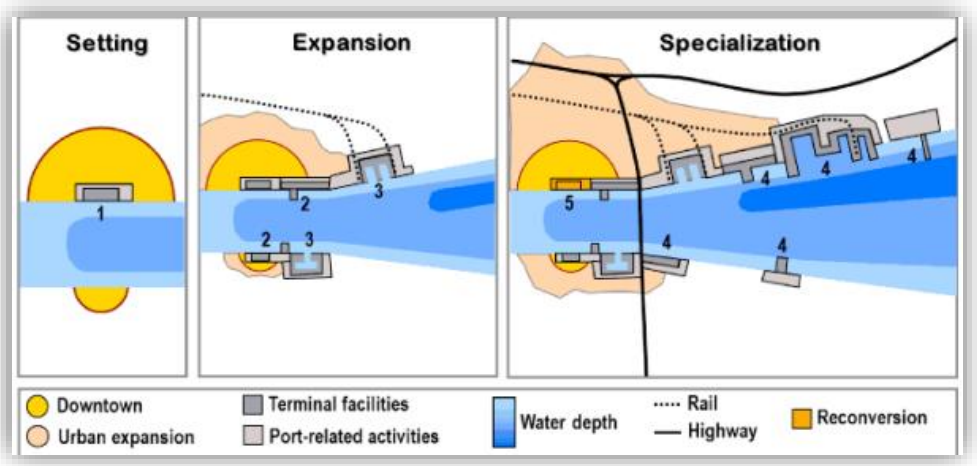


Figure 27 - ANYPORT Model

1. COLLABORATION WITH DURRES MUNICIPALITY, INTEGRATION WITH EXISTING PLANS

The revitalization of green areas and creation of new green parks will be done in strong relation to the municipality development strategies. Therefore, before starting the solutions e deployment a common work plan should be agreed with Durres Municipality.

2. STAKHOLDERS CONSULTATION AND FEEDBACK

The main group of people affected by the revitalization of the green areas inside the port will be all the port employees. Therefore, during the seminars for waste management, there should be a starting conversation to collect the necessary feedback on the green areas to be "revitalized". As the main beneficiaries the employees, should submit their ideas to contribute to a more sustainable green port.

3. USE OF NATIONAL FUNDS AND/OR EU FUNDS

The costs of intervention are relatively too high for the DPA only, therefore other possible sources should be identified. National funds and EU funds should be a suitable and accessible source, considering the fact that green investments are part of both national and EU long term sustainable strategies.

B. A Recycling Plan for a Sustainable Port.

Durres Port Authority is committed to reducing the impact of shipping on the environment and works within international fora to achieve consistent standards. The International Convention on the Prevention of Pollution from Ships (known as MARPOL) provides an international framework on how pollution from shipping should be regulated.

MARPOL simply requires States to ensure that the provision of waste reception facilities is "adequate" and do not cause "undue delay" to the ships using them.

A Port Waste Management Plan (PWMP) is a document produced by a port or terminal unifying their policy on waste reception facilities for vessels and outlining the facilities available at the location. This plan should demonstrate that they are fulfilling all the requirements of domestic and international regulations and that the facilities and infrastructure is available to meet the needs of vessels normally using the port/terminal without causing undue delays.

1. CONSULTATION WITH CUSTOMERS

Each terminal will have customers with differing priorities. Therefore, planners must consult their customers to be able to understand and meet their needs. Good facilities, at the right price, can only be provided if there is full and constructive dialogue between the harbor authority, terminal operator and the regular users as to what facilities should be provided to meet their normal needs for disposing of all types and quantities of waste, and for any special requirements. Ports/Terminals should consult with users as part of the triennial review of the waste management plan. Regular review meetings could be held as one way of continuing on-going consultation. At such meetings, the existing waste provision and plan could be discussed, together with suggested changes and improvements.

Other methods include newsletters, questionnaires, the use of notice boards, and contact with ships' agents and local representative bodies.

2. DATA COLLECTION AND ASSESSING THE NEED FOR WASTE RECEPTION FACILITIES

The adequate facilities cannot be provided without an accurate assessment of the need for them. Each terminal should collate information under three headings;

- The amounts of each type of waste actually received in the port or terminal;
- The amounts of each type of waste which should be received in the port or terminal;
- The amounts of each type of waste stored by ships for reception in other ports/terminals.

The information received from notification will aid the collection of waste arising statistics and enable waste management planners to tailor the requirements to ensure sufficient capacity of reception facilities.

3. INFORMATION TO BE INCLUDED IN THE PLAN

An assessment of the need for waste reception facilities, in the light of the need of the ships normally visiting the harbor or terminal;

- a description of the type and capacity of waste reception facilities;
- a detailed description of the procedures for the reception and collection of prescribed wastes
- a description of the charging system;
- procedures for reporting alleged inadequacies of waste reception facilities;
- procedures for on-going consultations with persons using the harbor or terminal, waste contractors and other interested parties; and,
- The type and quantities of prescribed wastes received and handled.

4. CONSIDERING LOCATION AND EASE OF USE

When selecting a site for facilities the following considerations should be taken into account: their siting should be convenient for users, contractors and vehicles but should not hinder other port/terminal operations or impact adversely on the local community; there should be a minimal risk of wastes entering the water; and they should be clearly identified and well-lit.

5. REDUCING, REUSING AND RECYCLING WASTE

When assessing the best practical environmental option for dealing with waste the following principles should be encouraged: Reduction of the amount of waste generated; its re-use (either for the same or a different purpose); Recycling to recover value from the waste, and Composting or energy recovery.

6. INSPECTIONS BY STAFF

DPA staff will inspect a number of ports/terminals each year. The inspections will include discussions with the port or terminal operator and their users, checking records, walking the site to check the position of facilities and gain an overall impression of the effectiveness of waste provision. They will check the accuracy of the approved plan and whether current practice complies with the plan.

Additionally, the staff may investigate if vessels report inadequacies in the Port/Terminals waste management facilities.

C. A Mobility Plan for Durres Port Staff

Travel Plan can be organized and schematized in five main phases:

1. Informative and analysis phase
2. Planning phase
3. Confrontation phase
4. Realization phase
5. Update and monitoring phase

1. INFORMATIVE AND ANALYSIS PHASE

It's the starting phase, the most important and delicate one, on which the success of all the Plan depends. During this phase all the necessary information is gathered:

- employees' travel behavior
- available resources on-site (a kind of business audit: addressing existing costs for business travel, cost of car parking, fleet cars, etc.) site accessibility
- spatial analysis (geo-positioning)

The analysis of the travel behavior is generally done by means of a written questionnaire survey, while the external spatial field analysis is done by geo-positioning the information on the territory and analyzing the accessibility of the sites.

2. PLANNING PHASE

Once the analyzing phase is pursued it is necessary to set objectives and achievable targets it is very important to set targets for reducing the number of staffs travelling to work alone by car. Looking at the results of the staff survey and spatial analysis it should be possible to draw up some idea of how many people can change their current method of getting to work.

To be successful and effective the set of measures should be a correct and balanced mix. Together they should fit into real strategies which may be structured as follows:

Persuasion strategy, all measures planned within the persuasion strategy can be perceived as "very soft measures". they are characterized by information and communication aimed at generating awareness of the problem and at positively changing the daily behavioral travel habits;

- Concession strategy, the measures within this strategy want to actively encourage and convince the persons towards modal shift and therefore are characterized by concrete actions such as the improvement of the Public Transport services; monetary agreements (discount on season tickets) to promote Public Transport, offering financial support for the purchase of ecologic vehicles (e.g. electric bicycles/scooters);

- Restriction strategy, the measures within this restriction strategy tend to be perceived as "harder" and may include pricing schemes to deter the use of individual private car use, such as the introduction of restrictive parking management schemes.

3. CONFRONTATION PHASE

In this phase the Mobility Manager has an intermediary role between the interested personnel, top management's needs, the employees and all the other stakeholders (such as Public Transport companies, local authorities, trade union, other companies in the same business park). In this phase the availability and feasibility of the proposed activities have to be verified. This means that a series of meetings have to be organized to encourage and ensure harmonization and thus a success of the planned activities.

To ensure effectiveness and efficiency for the identified set of measures it is vital to develop a precise communication plan (for more detail, see focus 3) in order to inform and sensitive the stakeholders involved.

The confrontation phase has to be a constructive phase and has to "open the doors" to the realization phase of the strategies identified within the Company Travel Plan.

The strategies will have to be analyzed, shared and accepted by all the parties concerned and the activities to be carried out shall be added to the drafting of the single document

4. REALIZATION PHASE

Once the correct set of measures has been identified and the company's management has decided upon the budget to dedicate to, the realization phase of these measures can start. The Mobility Manager has to start organizing the actions, coordinate the initiatives and verify that the services are being deployed.

The Public Transport Company may modify its time schedules; bicycle racks may be installed close to the company entrance; dedicated parking slots may be reserved for carpoolers; monetary agreements may be defined with shops for TV - shopping, etc. The variety of measures to be implemented is immense!

5. UPDATE, MONITORING AND EVALUATION PHASE

In order to maintain an updated overview of the company's mobility situation concerning the commuter travel, usually a questionnaire is handed out to new employees. This procedure allows a quick and simple updating methodology of the existing database. For what the monitoring is concerned periodical sample surveys must be carried out to compare the effectiveness of the measures introduced and of the communication activities undertaken. These periodical sample surveys allow to verify and evaluate the degree of participation of the employees to the Mobility Management actions undertaken.

D. Clean Energy Investment (renewable)

The improvement of energy efficiency policies and strategies is one of the most cost-effective ways to currently improve the security of supply, reduce energy-related emissions. In addition, it assures the affordable energy prices, and improve economic competitiveness.

For this purpose, the Energy Efficiency Directive (EED; Directive 2012/27/EU) entered into force on in 2012. The EED establishes a common framework of measures, and to pave the way for further energy efficiency improvements beyond. The target is to enhance efficient use of energy in supply and demand side and explains requirements of energy audits and energy management systems.

1. PORT ENERGY MANAGEMENT PLAN

This is a crucial tool to address environmental objectives by structuring an in-detailed analysis of the current energy consumption in the port area and subsequently propose potential energy-saving solutions. The primary objective is to maximize the profit and to minimize the cost in a low-carbon economy systematic approach. In detail there are three groups of specific objectives to achieve by Energy Management System application in the Port:

A-Meet the following European Directives and strategies at local and regional levels:

- Energy Efficiency Directive (EED; Directive 2012/27/EU)
- Directive 2014/94/EU on the deployment of alternative fuels infrastructure
- Europe 2020: A European Strategy for Smart, Sustainable and Inclusive Growth
- European Energy Security Strategy, published in 2014 by EU Commission.

B- To address environmental concerns:

- Reduction in energy consumption and consequently CO2 Emission from port activities.
- Defining goals that result in the reduction of port-related Air Pollutant Emissions and the health cost on local communities in port-city
- Raising the environmental profile/performance of ports and promoting innovation in sustainability.
- To reduce the energy consumption and improve the air quality which is currently the top priority of EU Ports according to ESPO 2016 Report.
- Improving environmental, energy and port performance in a systematic and standardized approach.
- Future proofing against the effects of climate change.

C- To support the port sustainable growth through:

- Reduced energy consumption bills and its related cost savings.
- Reduction in Capital investments to meet the growing energy demand in the future.
- Improvement in the competitiveness through reduction of operational costs and increased supply reliability.

- Being cost-effective with environmental regulations.
- The increase of efficiency and port performance.
- Improving port's market position.

2. PLANNING

Design of a Port Energy Management Program following top management's commitment encompasses the establishment of a Port Energy Policy, appointing an Energy Manager with responsibility of managing the energy management program and the formation of a Technical Committee comprising people with technical backgrounder. Electrical, mechanical, chemical and civil engineers who will be responsible of providing technical assistance to the Energy Manager.

Establish a Steering Committee shall guide the energy management program activities through communication and awareness creation, and the Departmental and Unit Coordinators are then chosen to make sure energy management and efficiency measures are directly implemented at the plant and operational levels.

The Energy policy document must:

- Show resolve from the management to work with relevant stakeholders in the formulation and implementation of studies, programs and projects geared towards improving energy resiliency, availability, reliability, efficiency and sustainability.
- include intentions in the utilization of renewable energy to increase production capacity, and the use, design and procurement of energy efficient processes in its operations, products and services and satisfy applicable legal requirements
- Spell out objectives and targets of the management plan and ways to achieve them. The targets shall be Specific, Measurable, Achievable

For improvements in the energy profile of a port, education and training for key stakeholders in the port business is a fundamental step. Employees of the port should also be sensitized on energy efficiency and management techniques to increase overall awareness levels, thus boosting the chances of success of the implementation. A training plan should be developed and implemented gradually to achieve its desired results.

The Energy Manager and the team shall prepare and define a list of Energy Performance Indicators which shall be used for benchmarking analysis. This, provides a mechanism to benchmark existing scenarios with baseline data to quantify energy performance, identify any existing gaps, so that the institution can take action to improve the system.

The energy needs of the port should be prioritized in terms of direct importance to operations and survival of the port, and the follow-up infrastructural/technological decision should result to the development of an Energy Master Plan detailing prioritized infrastructural projects with timelines and funding strategies.

3. IMPLEMENTATION

Understanding the energy profile of the port facilities and operations is a crucial first step, followed by considering potential energy saving measures while gauging the cost of the various measures. Action plan for implementation of the measures is drawn up, and specific cost-effective measures like replacement of inefficient equipment with energy efficient ones are implemented.

Performance of the new equipment needs to be evaluated against the set performance criteria like low consumption, which is the objective. Continuous evaluation is required to decide whether to continue using the new processes/equipment or not.

Finally acknowledging and recognizing the achievements in consumption and cost reductions is a morale booster to the equipment/plant operators as well as management.

7. Coordination with relevant plans

The aim is to ensure proposed actions are as much as possible linked and coherent with overall strategies at various territorial levels (local – e.g. SUMPs, regional, national, EU) and interdependent sectors (e.g. SEAPs, SECAPs, etc.).

Table 16 – Coordination with Relevant Plans

Proposed actions / Overall Strategy	Territory			
	EU Framework	Local	National	Regional
A. Revitalization of Green Spaces.				
Directive 2008 / 50 / EC – (About Environmental Air Quality and a Cleaner Air for Europe)	✓			
Territorial Strategy of Municipality Durres 2015 – 2030;		✓		
The National Strategy for the Quality of air AND environment; DECISION OF THE COUNCIL OF MINISTERS Nr. 594, dated 10.9.2014			✓	
B. A Recycling Plan for a Sustainable Port.				
Directives: 2000/59/EC; 2009/16/EC; 2010/65/EU, (To facilitate sea transport and contribute to the internal transport market.)	✓			
ALBANIAN NATIONAL WASTE STRATEGY/2010			✓	
Territorial Strategy of Municipality Durres 2015 – 2030;		✓		
Update Master Plan for the Port of Durres approved with the decision of CM no. 56 /2009		✓		
C. A Mobility Plan for Durres Port Staff.				
Albanian National Transport Plan (ANTP3)			✓	
Durres City Sustainable Urban Mobility Plan		✓		
Integrated intersectional plan of the economic area Tirana - Durres 2015 – 2030				✓
Update Master Plan for the Port of Durres approved with the decision of CM no. 56 /2009		✓		
Urban Mobility Package (2013)	✓			
D. Clean Energy Investment (renewable)				
Energy Efficiency Directive – Commission Guidance [COM(2013) 762]	✓			
LAW Nr. 124/2015 ON ENERGY EFFICIENCY *			✓	
Update Master Plan for the Port of Durres approved with the decision of CM no. 56 /2009		✓		
Grand Total	**4**	**6**	**4**	**1**

In the below table we will analyze the connection of each measure one by one with the geographical area and overall strategies already in effect in that area.

A. Revitalization of Green Spaces.

Table 17 - Coordination of Proposed Action No. 1 with Relevant Plans

Proposed actions	*Linked and coherent with overall strategies*		
	Territory	Overall strategy	Comments
A. Revitalization of Green Spaces.	Local	Territorial Strategy of Municipality Durres 2015 – 2030;	Given the vision of Durres 2030, in function of the territory as well as to orient the economic-social development by efficiently utilizing the potential of the territory, economic, environmental and social resources with the specific objective: - Protection and promotion of natural parks / valleys of the hinterland for visitors
	National	National Strategy for the Quality of Air and Environment DCM Nr. 594, /10.9.2014	This air quality strategy sets policy objectives and options to further improve air quality in Albania over the long term.
	EU Framework	Directive 2008/50/ EC	About Environmental Air Quality and a Cleaner Air for Europe

B. A Recycling Plan for a Sustainable Port.

Table 18 - Coordination of Proposed Action No. 2 with Relevant Plans

Proposed actions	*Linked and coherent with overall strategies*		
	Territory	Overall strategy	Comments
B. A Recycling Plan for a Sustainable Port.	Local	Territorial Strategy of Municipality Durres 2015 – 2030;	Give the vision of Durres 2030, in function of the territory as well as to orient the economic-social development by efficiently utilizing the potential of the territory, economic, environmental and social resources with the specific objective: To aim at preserving natural resources and protecting the environment. It affects the Municipality of Durres through the integration of the current natural systems, the creation of parks networks, and the provision of a better quality of life and business. PPK urgently directs urban waste management towards a closed cycle.
	Local	Update Master Plan for the Port of Durres approved with the decision of CM no. 56 /2009	Decide optimal operational, commercial and financial strategies in long terms period.
	National	ALBANIAN NATIONAL WASTE STRATEGY/2010	Revised Strategy and covers the period 2018-2033, the main purpose to update policies and the National Plan for Integrated Waste Management and to reassess the country's capabilities to fulfil the obligations of European Union (EU) membership deriving from the ACQUIS COMMUNAUTAIRE, Chapter 27 on the Environment
	EU Framework	Directives: 2000/59/EC; 2009/16/EC; 2010/65/EU	includes the adoption of common rules for sea transport Although the Directive aims to protect the marine environment from discharges of waste at sea, its overall policy objective is to facilitate sea transport and contribute to the realisation of the internal transport market.

C. *A Mobility Plan for Durres Port Staff.*

Table 19 - Coordination of Proposed Action No. 3 with Relevant Plans

Proposed actions	*Linked and coherent with overall strategies*		
	Territory	Overall strategy	Comments
C. A Mobility Plan for Durres Port Staff.	Local	Update Master Plan for the Port of Durres approved with the decision of CM no. 56 /2009	Decide optimal operational, commercial and financial strategies in long terms period.
	Local	Durres City Sustainable Urban Mobility Plan	An extension of the measures and actions proposed by DURRES SUMP (which is in the process of finalization), suggesting the encouragement of private companies and local institutions for the realization of the "Company Travel Plan"
	Regional	Integrated intersectional plan of the economic area Tirana - Durres 2015 -2030	The Tirana-Durres Economic Zone should increase the quality of life, appropriate transport and electronic infrastructure to be provided, which will enable the fast and secure movement of people, goods and information.
	National	Albanian National Transport Plan (ANTP3)	Essential to support strategies for economic and social development, with specific objective: 1. Create an environmentally sustainable transport system 2. Improve safety, quality and reliability of the transport system; etc...
	EU Framework	Urban Mobility Package (2013)	SUMP's main goals: • ACCESSIBILITY: Guaranteeing accessibility to all road users, with a focus on the so-called "vulnerable users", namely pedestrians, cyclists, children, disabled persons, etc.; • MODAL SPLIT REBALANCING: fostering a balanced development of all transport modes, tackling public and private, motorized and non-motorized transport, inter-modality, urban logistics, mobility management and ITS systems; • ENVIRONMENTAL, TECHNICAL, ECONOMIC AND SOCIAL SUSTAINABILITY: reducing environmental impacts rationalizing efficiency and cost-effectiveness; • CITIES' ATTRACTIVENESS AND QUALITY OF LIFE: optimizing the use of urban areas leading to a cleaner urban environment and consequently more attractive cities and better quality of life for all citizens; • SAFETY AND SECURITY: improving road safety and security

D. Clean Energy Investment (renewable).

Table 20 - Coordination of Proposed Action No. 4 with Relevant Plans

Proposed actions	*Linked and coherent with overall strategies*		
	Territory	Overall strategy	Comments
D. Clean Energy Investment (renewable)	Local	Update Master Plan for the Port of Durres approved with the decision of CM no. 56 /2009	Decide optimal operational, commercial and financial strategies in long terms period.
	National	LAW Nr. 124/2015 ON ENERGY EFFICIENCY	a) Drafting of national rules and Set up policies for promotion, and improvement efficient energy use, with the aim of saving energy and increasing security supply and removal of barriers in the energy market; b) setting national energy efficiency targets
	EU Framework	Energy Efficiency Directive – Commission Guidance [COM (2013) 762]	Lead the clean energy transition, not only adapt to it. For this reason, the EU has committed to cut CO2 emissions by at least 40% by 2030 while modernising the EU's economy and delivering on jobs and growth for all European citizens. The proposals have three main goals: putting energy efficiency first, achieving global leadership in renewable energies and providing a fair deal for consumers.

8. Assessment design

This Policy Document has been developed by the Durres Port Authority to improve the environmental sustainability of new developments and to encourage continuous environmental improvement of existing activities on the Durres port.

Regarding the evaluation framework when is discussed to holistically address and are identified the sustainability targets and indicators of the proposed actions from the beginning, as well as following "as is" vs. "to be" scenarios assessment approach, a set of actions and measure are planned to implement in the Durres port looking to the near and long terms governance issues. These suggested actions / measures are not the only ones that can be implemented but they are an alternative and innovative measures that are relevant to the facility and current operations.

Table 21 - Targets to reach until 2025

Proposed actions / measures	*2025 Targets*
A. Revitalization of Green Spaces	
Divide the port in distinct areas, according to categories of functions	• Increase the green areas by 50 % • Air Parameters within EU norms
Revitalize the and create green areas within the port territory and nearby areas	
B. A Recycling Plan for a Sustainable Port	
Employee Environment training. Recycling Seminars	• 20 % of waste is recycled • 30 % of waste disposed by vessels is already sorted on board
Waste fee reduction for sorted waste	
Waste Management Plan	
C. A Mobility Plan for Durres Port Staff	
Establish the Company bus for peripheral resident commuters' staff	• Shift to green transport modes for at least 65 % of staff commuters: ○ Increase to 25 % the walking trips ○ Increase to 15 % the cycling trips ○ Increase to 25 % the collective trips
Foster beaver change to the bus public transport use, addressed to the City and peripheral resident commuters' staff (soft Measure)	
Introduce carpool to the other city commuters' staff (Soft Measure)	
D. Clean Energy Investment (renewable)	
Conversion of all port cranes and vehicles from diesel engine to electrical ones.	• Shift 50% of energy consumption to renewable energy sources • 65 % of port machineries are electric type
Installation of Photovoltaic Plant System. (Project Proposal Already Drafted)	
On-shore power supply (OPS)	

Focusing in the vision of Durres Port as “Sustainable and Low-carbon Port” the targets of DPA for each of the priorities are:

1. ***To be a port with green space area, by revitalization, replacement, maintenance of current green spaces as well as extension of other ones.***

Three measures are expected to be implemented in 5 years for the first target (up to 2025):

- Increase air quality by adding green areas and improving the surrounding areas
- Divide the port in distinct areas, according to categories of functions
- Revitalize the existing green areas and create new green areas within the port territory

The main benefits expected:

- Increase the Air quality
- Improve the integration port/urban area
- Improve the port working conditions
- Add tourist related revenues

Targets to reach within 2025:

- Increase the “green areas”, at least by 50%
- The air parameters should go within EU norms

2. *To be a clean waste port by implementing a real Sustainable Port Waste Management as the added advantage of preserving natural resources, reducing energy requirements (with associated greenhouse gas emissions) and cutting costs.*

Three measure are forecast to implement in 2 years for the second target (up to 2021)

- Prepare and implement the Waste Management Plan that:
    a. Minimize the generation of wastes.
    b. Facilitate recycling to reduce the amount of waste going to landfill.
    c. Ensure the safe storage and handling of hazardous wastes.
- Waste fee reduction for sorted waste
- Employee Environment training. Recycling Seminars.

The main benefits expected:

- Increase the recycling rate and improve the waste management system
- Reduced waste fee offered for vessels which sort the waste on board
- Creating a “green mind-set” of the employees through short training sessions

Targets to reach within 2025:

- 20 % of waste is recycled
- 30 % of waste disposed by vessels is already sort on board of said vessel

3. *To be a Green Mobility Port, by establish and implementing a Sustainable and Low-carbon Mobility Plan for main staff and tourist in Port of Durres.*

Several measures are forecast to implement in 2 years for the second target (up to 2021)

A. Implementation the Low Carbon Transportation Plan produced by LOCATIONS project focused on tourist mobility

B. Produce and implementation of Mobility Plan for Durres Port Staff.

- Provide 2 bus company and approve the time and itinerary
- Establish Bicycle parking lots near workplace within the Port area
- Set up the bicycle lines within the port area
- Mobility Management Soft Measure:
  a. Introduce carpool to the other city commuters' staff
  b. Foster behavior change of commuters and professional trips to shift to the bicycle.
  c. Foster behavior change of commuters trips, addressed to the residents within 3km distance
  d. Foster the staff using bus public transport;
  e. Foster City bus operators to improve the quality of service

The main benefits expected:

- Shift to the green transport modes from 40% to 58% within next 3 years, by reducing the private car use by staff commuters from 60% to 42%.
- Increase to 22% of commuters' staff walking trips
- Increase to 11% of cycling commuter's staff trips
- Increase to 21% of collective transport commuter's staff trips

Targets to reach within 2025:

- Shift to green transport modes for at least 65 %
  - Increase to 25 % of commuters' staff walking trips
  - Increase to 15 % of cycling commuter's staff trips
  - Increase to 25% of collective transport commuter's staff trips

4. *To be a Port with Efficiency Energy Consumption by Introduce and Invest of renewable energy consumption*

Three measure are forecast to implement in 10 years for this target (up to 2030)

- Installation of Photovoltaic Plant System.
- Conversion of all port cranes and vehicles from diesel engine to electrical ones.
- "On-shore power supply" (OPS)

The main benefits expected:

- Efficient use of port resources
- Reduce cost of port operations
- Reduce noise and air pollution by anchored vessels to almost **"zero"**

Targets to reach within 2025:

- Shift 50% of energy consumption to renewable energy sources
- 65 % of port machineries are electric type

In Conclusion:

Durres Port Authority has a significant role to play in the management of most precious natural resources DPA will be active in protecting these community assets and are committed to minimizing impacts on the environment. In creating this Sustainable and Low Carbon Port Action Plan, our aim is to encourage port developers and operators to adopt sustainable business approaches and to encourage innovation in design and operation.

The Sustainable and Low Carbon Action Plan is prepared using SUPAIR Project Guidelines and accompanying Checklist provide some simple strategies and practices to demonstrate how developments can be both environmentally friendly and commercially viable. They have been designed to incorporate additional marketable outcomes such as potential Green Port accreditation.

By taking a proactive approach to simple environmental solutions such as reducing energy consumption and careful material selection, mobility management, green space area, we can manage impacts on local communities and together contribute to making our ports a 'greener' place.

9. Monitoring Plan

The below monitoring process was envisaged to track the impacts and effects of proposed actions over time.

The below tables describe in each case the monitoring scheme. For each measure a timeline is set to collect the data, and who will be in charge of the process. After the collection a periodic report will be drafted for each measure and compared to the expected outcomes.

Table 22 - Monitoring Process for the Revitalization of Green Spaces

A. Revitalization of Green Spaces.							
Specific Goal A	**Start / deadline**	**Outcomes**	**Indicators**	**Source of data**	**Responsibility for monitoring**	**Monitoring Schedule**	**Description and Methodology**
Increase air quality by adding green areas and improving the surrounding areas	**01/20 - 01/25**	**Increase the Air quality**	**Reduced the GHG emissions**	**Durres City Environmental; Air quality Department**	**Durres Port Authority**	**Every 6 months**	**Gathering of data recorded by scheduled monitoring**
Measure A.1	Start/deadline	Outcomes	Indicators	Source of data	Responsibility for monitoring	Monitoring Schedule	Description and Methodology
Divide the port in distinct areas, according to categories of functions	01/20 - 01/25	Improve the integration port/urban area.	Number of urban Aria Integration	Durres Port Authority	Durres Port Authority	Every year	Durres Port Authority Survey
Measure A.2	Start/deadline	Outcomes	Indicators	Source of data	Responsibility for monitoring	Monitoring Schedule	Description and Methodology
Revitalize the existing green areas and create new green areas within the port territory	01/20 - 01/22	Increase the “green areas”, at least by 50%	Number existing green areas revitalization; Number of new green areas created.	Durres Port Authority	Durres Port Authority	Every 6 months	Durres Port Authority Survey

Table 23 - Monitoring Process for the Recycling Plan for a Sustainable Port

B. A Recycling Plan for a Sustainable Port.							
Specific Goal B	**Start / deadline**	**Outcomes**	**Indicators**	**Source of data**	**Responsibility for monitoring**	**Monitoring Schedule**	**Description and Methodology**
Waste management	**09/19 - 01/21**	**Sustainable Port Waste Management**	**Reduced the GHG emissions**	**Durres Port Authority Port Private Operators**	**Durres Port Authority**	**Every 3 months**	**Gathering of data recorded by scheduled monitoring**
Measure B.1	Start/deadline	Outcomes	Indicators	Source of data	Responsibility for monitoring	Monitoring Schedule	Description and Methodology
Waste Management Plan	09/19 - 02/20	Increase the recycling rate and improve the waste management system	Document lunch; Number of facilities available at the location, fulfilling all the requirements of domestic and international regulations.	Durres Port Authority; Terminal Operators	Durres Port Authority	Every 3 month	Durres Port Authority Survey
Measure B.2	Start/deadline	Outcomes	Indicators	Source of data	Responsibility for monitoring	Monitoring Schedule	Description and Methodology
Waste fee reduction for sorted waste	01/20 - 01/21	Reduced waste fee offered for vessels which sort the waste on board	Reduced waste fee order lunched; Number of waste fees reduced.	Durres Port Authority; Terminal Operators	Durres Port Authority	Every 6months	Durres Port Authority Report
Measure B.3	Start/deadline	Outcomes	Indicators	Source of data	Responsibility for monitoring	Monitoring Schedule	Description and Methodology
Employee Environment training. Recycling Seminars	01/20 - 01/21	Creating a "green mind-set" of the employees through short training sessions.	Number of employee trained; number of Seminars organized.	Durres Port Authority; Terminal Operators	Durres Port Authority	Every 3 months	Durres Port Authority Report

Table 24 - Monitoring Process for the Mobility Plan for Durres Port Staff (Priority C.1)

C. A Mobility Plan for Durres Port Staff.							
Specific Goal C.1	**Start / deadline**	**Outcomes**	**Indicators**	**Source of data**	**Responsibility for monitoring**	**Monitoring Schedule**	**Description and Methodology**
Shift commuters staff trips to the collective transport modes	**01/20-01/21**	**Increase to 21% of collective transport commuters staff trips**	**% of commuters staff trips shift to the collective transport**	**Durres Port Authority Port Private Operators**	**Durres Port Authority**	**Every 3 months**	**Gathering of data recorded by scheduled monitoring**
Measure C.1.1	Start/deadline	Outcomes	Indicators	Source of data	Responsibility for monitoring	Monitoring Schedule	Description and Methodology
Increase the bus public transport use, addressed to the City and peripheral resident commuters staff	01/19-01/20	Foster the staff using bus public transport; Foster City bus operators to improve the quality of service	Number of Staff using the public Transport	Durres Port Authority; City bus transport companies Terminal Operators	Durres Port Authority	Every month	Durres Port Authority Survey
Measure C.1.2	Start/deadline	Outcomes	Indicators	Source of data	Responsibility for monitoring	Monitoring Schedule	Description and Methodology
Establish the Company bus for peripheral resident commuters staff	01/20-06/21	Provide 2 bus company and approve the time and itinerary	Number of Employee Staff using the Bus Company	Durres Port Authority; Private bus transport Companies Terminal Operators	Durres Port Authority	Every month	Durres Port Authority Report
Measure C.1.3	Start/deadline	Outcomes	Indicators	Source of data	Responsibility for monitoring	Monitoring Schedule	Description and Methodology
Introduce carpool to the other city commuters staff	05/20-01/21	Creating a "carpool platform"	Number of employees used the carpool platform	Durres Port Authority; Terminal Operators	Durres Port Authority	Every month	Durres Port Authority Report

Table 25 - Monitoring Process for the Mobility Plan for Durres Port Staff (Priority C.2)

C. A Mobility Plan for Durres Port Staff.							
Specific Goal C.2	**Start / deadline**	**Outcomes**	**Indicators**	**Source of data**	**Responsibility for monitoring**	**Monitoring Schedule**	**Description and Methodology**
Shift commuters staff trips to the walking	**10/19-01/21**	**Increase to 22% of commuters staff walking**	**% of commuters staff trips shift to walking**	**Durres Port Authority Port Private Operators**	**Durres Port Authority**	**Every 3 months**	**Gathering of data recorded by scheduled monitoring**
Measure C.2.1	Start/deadline	Outcomes	Indicators	Source of data	Responsibility for monitoring	Monitoring Schedule	Description and Methodology
Mobility Management Soft Measure	03/20-02/21	Foster Beaver change of commuters trips, addressed to the residents within 3km distance	Number of Staff changed behavior; Number of reduced car parking within the port area.	Durres Port Authority; Terminal Operators	Durres Port Authority	Every month	Durres Port Authority Survey

Table 26 - Monitoring Process for the Mobility Plan for Durres Port Staff (Priority C.3)

C. A Mobility Plan for Durres Port Staff.							
Specific Goal C.3	**Start/deadline**	**Outcomes**	**Indicators**	**Source of data**	**Responsibility for monitoring**	**Monitoring Schedule**	**Description and Methodology**
Shift commuters staff trips to the cycling	**05/20-01/21**	**Increase to 11% of cycling commuters staff trips**	**% of commuters staff trips shift to cycling**	**Durres Port Authority Port Private Operators**	**Durres Port Authority**	**Every 3 months**	**Gathering of data recorded by scheduled monitoring**
Measure C.3.1	Start/deadline	Outcomes	Indicators	Source of data	Responsibility for monitoring	Monitoring Schedule	Description and Methodology
Establish Bicycle parking lots near workplace within the Port	05/20-02/21	Parking bicycle lots in which terminal and DPA Offices	Number of Parking lots built	Durres Port Authority; Terminal Operators	Durres Port Authority	Every month	Durres Port Authority Survey
Measure C.3.2	Start/deadline	Outcomes	Indicators	Source of data	Responsibility for monitoring	Monitoring Schedule	Description and Methodology
Set up the bicycle lines within the port area	05/20-02/21	Bike line connection inside the Port Terminals and DPA offices	Km of bike line completed	Durres Port Authority; Terminal Operators	Durres Port Authority	Every month	Durres Port Authority Survey
Measure C.3.3	Start/deadline	Outcomes	Indicators	Source of data	Responsibility for monitoring	Monitoring Schedule	Description and Methodology
Mobility Management soft Measure	10/19-01/21	Foster beaver change of commuters and professional trips to shift to the bicycle.	Number of Staff changed behavior; Number of reduced car; Number of l trips shift to bike	Durres Port Authority; Terminal Operators	Durres Port Authority	Every month	Durres Port Authority Survey

Table 27 - Monitoring Process for the Clean Energy Investment

D. Clean Energy Investment (renewable)							
Specific Goal D	**Start / deadline**	**Outcomes**	**Indicators**	**Source of data**	**Responsibility for monitoring**	**Monitoring Schedule**	**Description and Methodology**
Introduce of renewable energy consumption	**01/20-01/30**	**Shift 50% of energy consumption to renewable energy sources**	**% of shift to renewable energy sources**	**Durres Port Authority Port Private Operators**	**Durres Port Authority**	**Every year**	**Gathering of data recorded by scheduled monitoring**
Measure D.1	Start/deadline	Outcomes	Indicators	Source of data	Responsibility for monitoring	Monitoring Schedule	Description and Methodology
Installation of Photovoltaic Plant System.	01/20 - 01/22	Full Project completed and approved	Service and construction Contracts singed; Installation of the photovoltaic plant system.	Durres Port Authority	Durres Port Authority	Every year	Durres Port Authority Report
Measure D.2	Start/deadline	Outcomes	Indicators	Source of data	Responsibility for monitoring	Monitoring Schedule	Description and Methodology
Conversion of all port cranes and vehicles from diesel engine to electrical ones.	01/22 - 01/25	Convert all port vehicles and machines to electric ones	Number of vehicles shift to electric; Number of cranes shift to electric.	Durres Port Authority; Port Private Operators	Durres Port Authority	Every year	Durres Port Authority Report
Measure D.2	Start/deadline	Outcomes	Indicators	Source of data	Responsibility for monitoring	Monitoring Schedule	Description and Methodology
On-shore power supply (OPS)	01/23 - 01/30	Allows vessels at berth to use shore power rather than rely on electricity generated by their own (auxiliary) engines.	Number Vessels use on-shore power	Durres Port Authority	Durres Port Authority	Every year	Durres Port Authority Reports

As seen in the above tables Durres Port Authority will have the main role to monitor the implementation of the measures and based on data returns to make the needed corrections.

Therefore, after the approval of this Action Plan the Department of Environmental Management should produce and release a periodic report, every six months, on the Action Plan Measures.