Interreg - IPA CBC
Italy - Albania - Montenegro
EUROPEAN UNION
EFINTIS

T2 PILOT PROJECTS

Version final

DT2.2.2 Pilot project no. 2 - ADSPMAM - (SASPA)

03/2023

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1 Ex-ante situation – Background of the pilot action

The Port Community System (PCS) of the Port of Bari is called GAIA – Generalised Automatic exchange of port Information Area – and was developed within the GAIA project co-funded by the Interreg Italy-Greece Cross-Border Cooperation Programme 2007-2013.

The Port Community System is an IT platform that allows the intelligent and secure exchange of information between public and private entities of the maritime-port cluster. the PCS optimizes, manages and automates port and logistics services by creating efficient processes, reducing the time required for procedures and minimizing the use of paper documents. GAIA is the Port Community System of the Port of Bari with which some port processes are managed digitally and with which innovative information services are offered to passengers and operators as well as free wi-fi internet connection in the passenger parking areas. GAIA constantly monitors the entire port process in real time, for each ferry ship departing from the Port of Bari, from the Security Card issuing procedure until the ship arrives at the destination port. It provides information on the status of boarding, on weather conditions, on the arrival and departure times of ships and, through the tracking function, notifies passengers of the exact position of ships during navigation and arrival times. All travel information is thus displayed directly on users' mobile devices, such as smartphones, tablets, notebooks, allowing constant and timely updates on boarding times and any ship delays, free of charge, making the travel experience and stay in a more peaceful city. Detailed information, in particular on road conditions, is also made available to road hauliers who, through these services, can thus decide on the best possible route to reach their intended boarding, as well as request online authorizations for access to the port and areas. of security. All the information generated by Gaia is also accessible in the port through special interactive kiosks. The use of GAIA has, in fact, revolutionized port activities by improving the work of operators, information management and the movement of passengers and vehicles, facilitating security checks by the police force. Furthermore, SASPA has developed the VEGA system within the activities foreseen by the strategic project "SUSPORT - SUStainable PORTs" financed by the Interreg Programme Italy-Croatia 2014-2020 Programme with the objective of improving the energy sustainability of maritime and multimodal transport through the development of joint action plans aimed at coordinating all the main actors involved in the maritime transport sector. This futuristic application aims to improve the energy sustainability of maritime and multimodal transport in the ports of Bari, Brindisi, Manfredonia, Barletta and Monopoli of the Southern Adriatic Sea Port System Authority as well as to strengthen its action to protect the environment in its ports. Within the framework of the "SUSPORT" project, phase 2 of the project was concluded with the acquisition of new environmental monitoring devices to meet the needs of all ADSPMAM ports. The system, designed and developed to be fully configurable with respect to monitoring needs, provides advanced consultation dashboards, through which heterogeneous data can be interpolated, such as the impact factor of infrastructure works on the main environmental monitoring benchmarks.

In according with DEASP and for the purposes of calculating the emissions of maritime traffic in the AdSPMAM ports, reference was made to the available registers, divided by freight and passenger / ferry traffic, within which the following main data were available:

- Name of the ship
- Gross tonnage
- date and time of arrival at the port
- date and time of departure (data not always reported)
- Port of competence
- Passengers and embarked vehicles

Starting from these data, using databases available on the net (marinetraffic.com and others), all the information necessary to calculate the fuel consumption of the ships inside the port area in the maneuvering conditions (for an assumed time equal to 30 minutes for mooring and 30 minutes for restarting) and during the mooring period (during which the ship's auxiliary powers are considered active according to IMO (2014) - Procedure for calculation and verification of the Energy Efficiency Design Index). The data searched were:

- Engine power
- Engine fuel
- Motor operating speed
- Maximum speed of the ship in knots
- Year of construction
- type of ship
- size of the ship
- DWT of the ship
- Maximum draft

Regarding the speed of rotation of the engine, where not available, it has been assumed that it runs at medium speed. Cruise ships not equipped with slow diesel engines were all considered to be electrically powered.

In order to estimate the draft of the ships during the maneuvering phases, the TPC (tonnage per centimeter) was calculated starting from the width, length and Block coefficient of the ships in the list. For freight ships it was assumed that they traveled with an average load compared to the maximum transportable. For passenger ships, on the other hand, knowing the number of vehicles and passengers embarked, an estimate was made on their average weight, which was then used to estimate the draft.

The speed of the ships in port, indispensable for the calculation of the instantaneous power of the engines according to the Jalkanen formula reported in the calculation procedure in paragraph 7.1.5 of the Susport document D.3.2.1, was assumed to be equal to 5 knots.

In the few cases in which it was not possible to trace the date and time of departure of the freight ships from the registers, only the maneuver time was calculated for the purpose of calculating the CO2 emissions.

The calculation of the annual CO2 emissions of freight ships was carried out starting from the average daily emission for each port, calculated over a period of approximately 40 days, assuming that this type of traffic for the ports of the AdSP MAM does not have a high seasonality.
The CO2 emission coefficient was derived from IMO MEPC 66/21 / Add.1 Annex 5, and equal to 3,206 tons of CO2 per ton of fuel (Marine Diesel) used.

This made it necessary to develop an application system to estimate the amount of greenhouse gases emitted by ships calling at the ports of Bari, Brindisi, Manfredonia, Barletta and Monopoli.

2 Pilot action description

With the pilot action of EFINTIS we will acquire an application to be integrated into the GAIA PCS, for the real-time processing of the polluting emissions produced by ships up to the calculation of the Carbon Footprint.

The processing will take place using the AIS (Automatic Identification System) traces that allow to establish the exact position and movements of the ships and the IHS Markit (global information company) certified ship registry and formulas that the IMO makes available to the international community.

✓ The final data will be stored in the GAIA PCS database and will be made available to the *port community through historical and real-time reports*

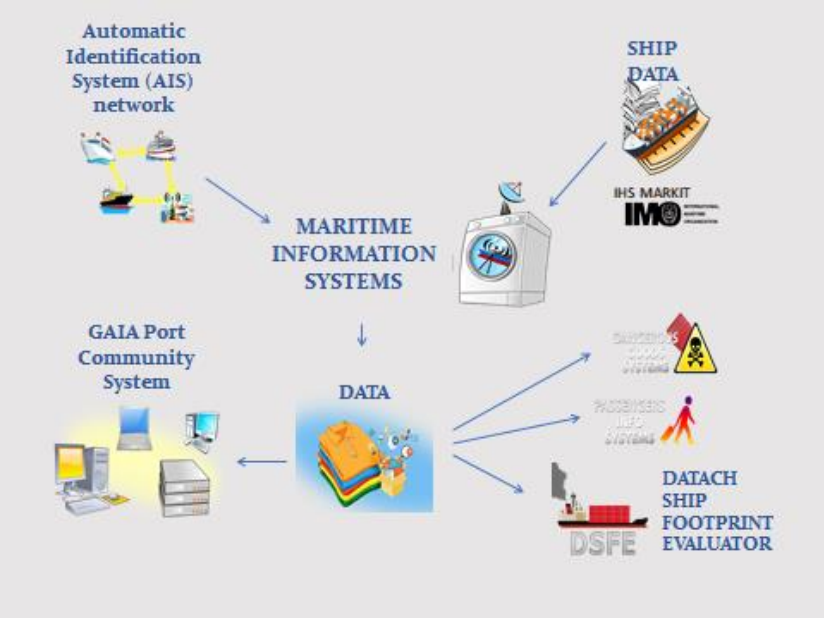


Figure 1: Data flow

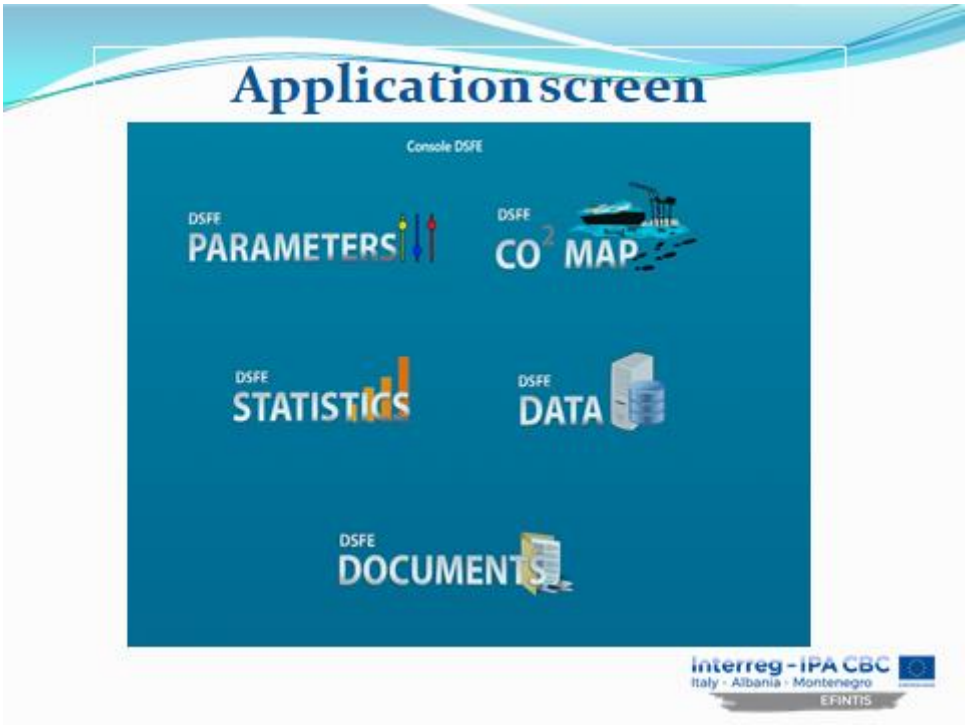


Figure 2: Application screen

Figure 3: List of ships intercepted by the DFSE system

Figure 4: List of ships intercepted by the DFSE system

Data emission calculated for each tipology of gas for each ship main motor emissions, secondary engine emissions, boiler emissions, maneuvering emissions, emissions during the mooring phase and finally, the total emissions calculation item**.**

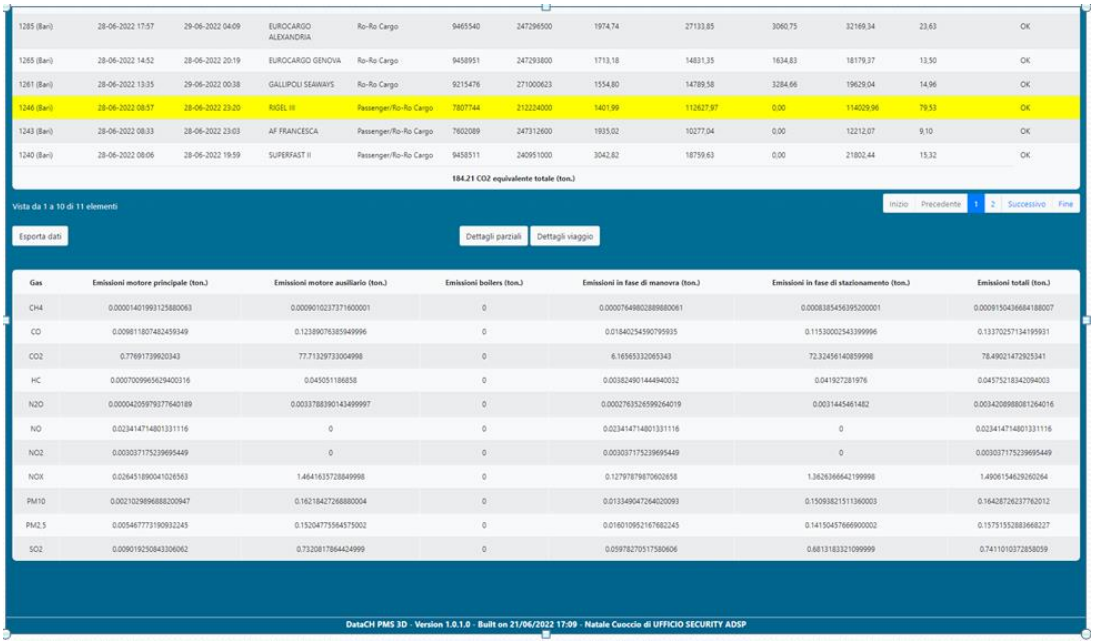


*Figure 5: **T**he energy consumption data per period and per ship*

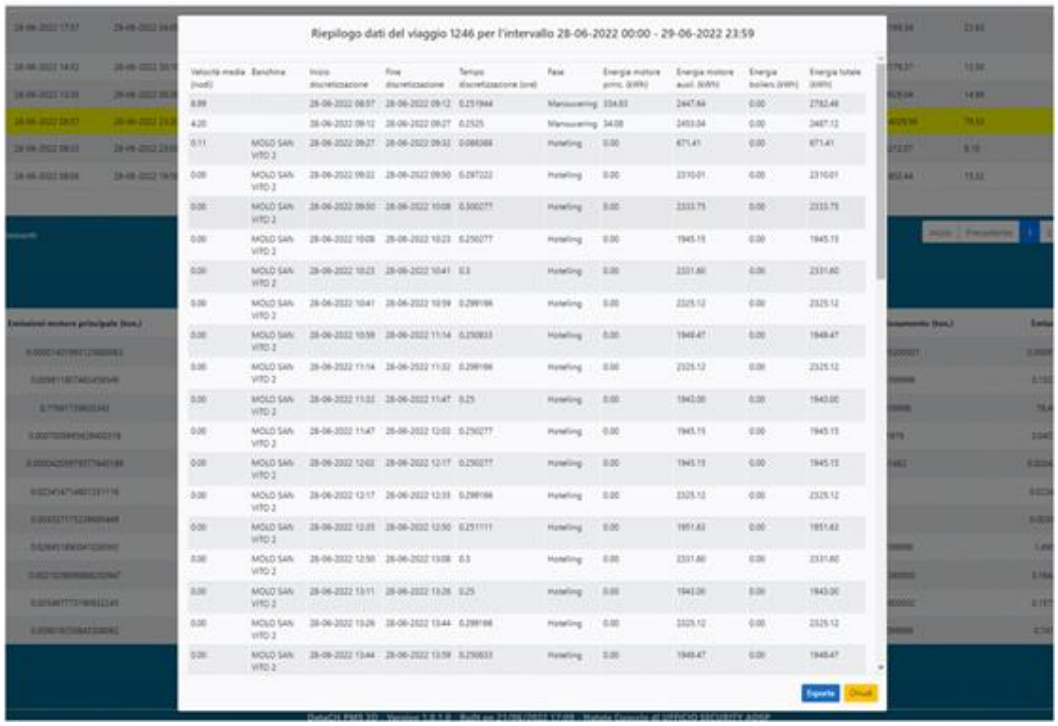


Figure 6: Map intercepting all ships in the area

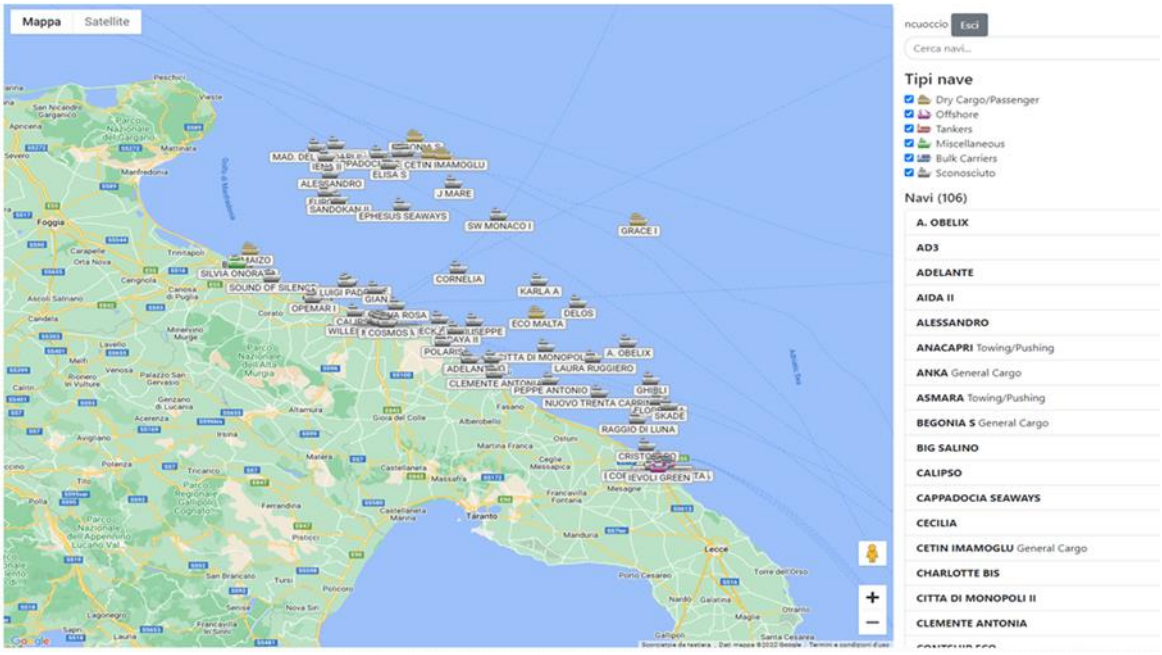


Figure 7: Detailed mapa and detailed data ship

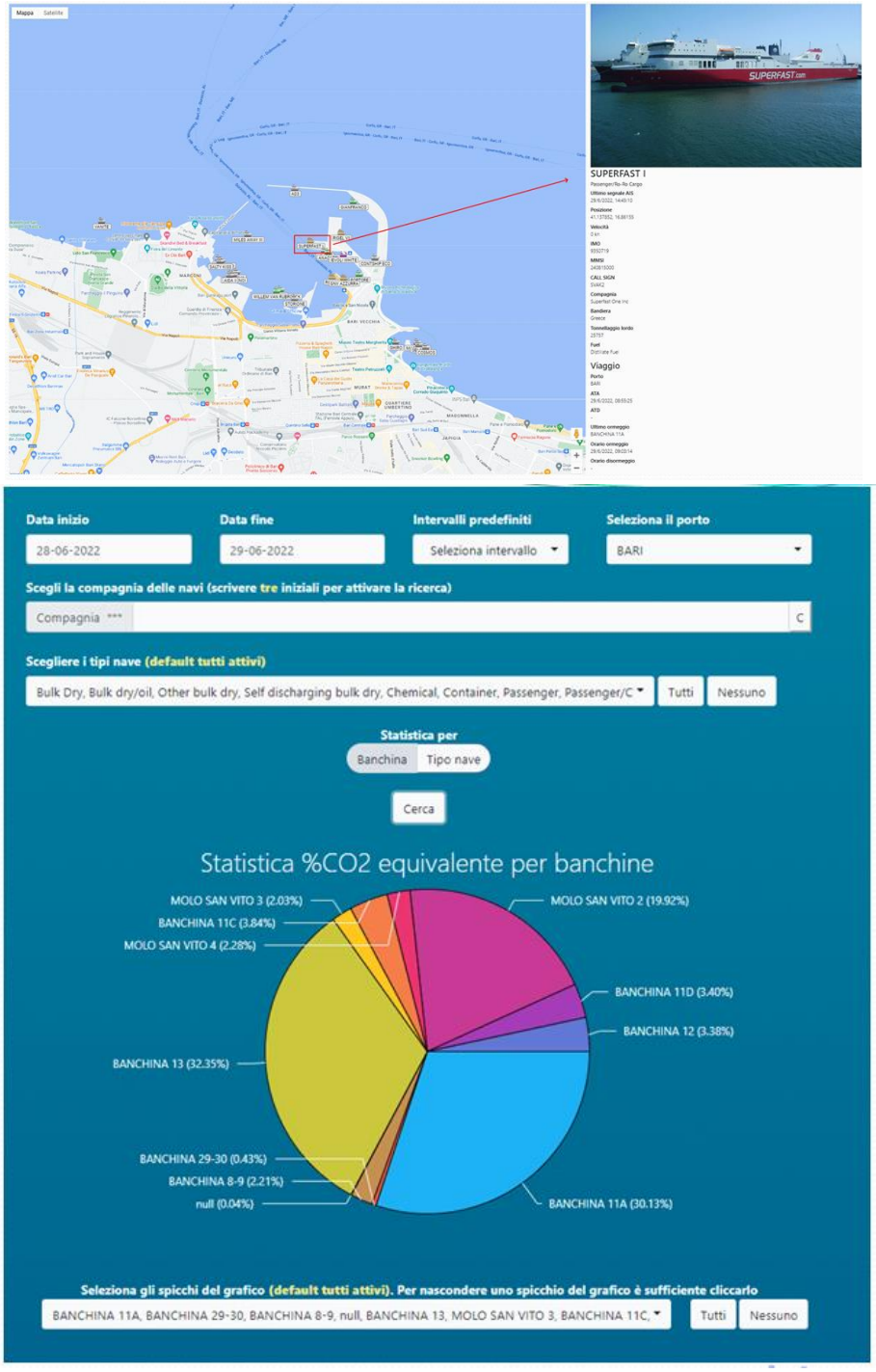


Figure 8: Statistic data regardind CO_2 emitted at the quay during the mooring phase

3 Stakeholders

In the first draft of the Energy and Environmental Planning Document (DPEASP) of the Southern Adriatic Sea Ports Authority, there was an important involvement of the stakeholders and port operators in the phase of study and identification of the objectives, in such a way that the port communities shared the choices that will be adopted in the immediate future. In fact, the DPEASP identifies the energy-environmental sustainability objectives of the ports; the interventions and measures to be implemented to achieve the objectives; the program of interventions, even partial ones over a fixed period of time; the process of monitoring actions aimed at verifying the results achieved.

In updating the DPEASP underway, stakeholders and port operators will also be involved in the process of identifying the energy needs and related sources of emission of the entire port area, as defined by the Port Regulatory Plan in terms of both territorial perimeters and activities, also involving companies operating in port areas:

- companies authorized by the AdSP to carry out port operations;
- companies authorized by the AdSP to carry out port services;
- companies that have received from the AdSP the concession of state-owned areas and docks included in the port area.

Such involvement will be ensured through the administration of specific questionnaires aimed at both the definition of future scenarios relating to any activities planned for the reduction of energy consumption and CO2 emissions, and the definition of the Carbon Footprint aimed at the acquisition of further data relating to means of transport (land and sea) and to the facilities and equipment used by the organisations involved in the Port network.

		POWER OF INFLUENCE	
		LOW	**HIGH**
INTEREST	**LOW**	– Customs – Border Police – Guardia di Finanza	– Ministry of Transport and Infrastucture – Coast Guard – Apulia Region – Enviromental Department Arpa – Politechnic of Bari
	HIGH		– Agencies – Industries – Logistic enterprises

Figure 9: Stakeholders influence Southern Adriatic Sea Ports Authority

4 List of figures

5 Annex

5.1 Results of the testing

Progetto EFINTIS - Fornitura di un sistema applicativo per la stima dei quantitativi di gas serra emessi dalle navi che fanno scalo nei porti di Bari, Brindisi, Manfredonia, Barletta e Monopoli, comprensivo di manutenzione adeguativa, evolutiva e di servizi Cloud qualificati.

Co-operation Programme Interreg IPA CBC Italia-Albania-Montenegro 2014-2020

Verbale di verifica attività di manutenzione evolutiva
CUP B89E20000510007 - CIG 9208003C72

Oggetto:	Progetto EFINTIS - Co-operation Programme Interreg IPA CBC Italia-Albania-Montenegro 2014-2020. Fornitura di un sistema applicativo per la stima dei quantitativi di gas serra emessi dalle navi che fanno scalo nei porti di Bari, Brindisi, Manfredonia, Barletta e Monopoli, comprensivo di manutenzione adeguativa, evolutiva e di servizi Cloud qualificati – Verbale di verifica attività di manutenzione evolutiva.		
Luogo:	Bari	**Data:**	25.05.2022
CUP:	B89E20000510007	**CIG:**	9208003C72
Importo:	€ 96.000,00 oltre IVA		
Impresa:	Datach Technologies Srl	**P.IVA**	01846050498
R.U.P.	Alessandro Nicola RENNA	**D.E.C.**	Natale CUOCCIO

In relazione all' attività di fornitura di un sistema applicativo per la stima dei quantitativi di gas serra emessi dalle navi che fanno scalo nei porti di Bari, Brindisi, Manfredonia, Barletta e Monopoli, nel dare atto che la scrivente ha ricevuto comunicazione di conclusione attività di manutenzione evolutiva, con nota in atti prot. nr. 35074 del 21.11.2022, richiesta al fornitore con comunicazione in atti prot. nr. 27581 del 09.09.2022, e confermata con ordine di servizio n.01 con nota in atti prot. nr. 28777 del 21.092022,

in data 23/11/2022 alle ore 8.30 ha avuto inizio, presso l'Ufficio Innovazione Tecnologica dell'Autorità di Sistema Portuale del Mare Adriatico Meridionale c/o Stazione Marittima San Vito, l'attività di verifica dell'attività di manutenzione evolutiva prevista nei seguenti punti:

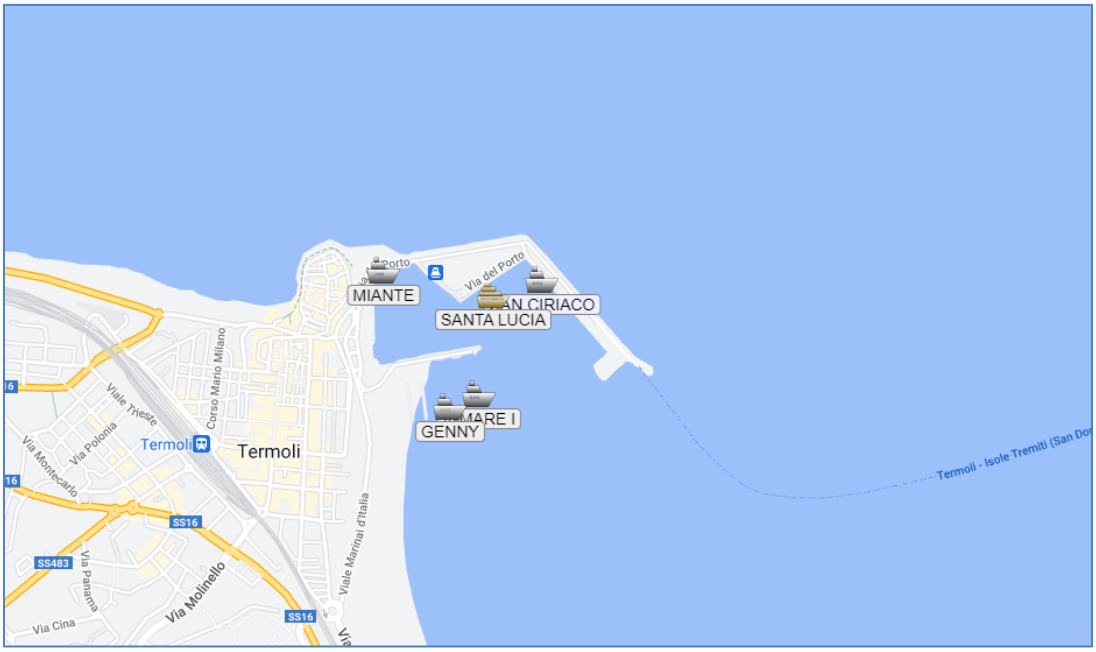
a) Estensione dell'applicativo al Porto di Termoli, previa classificazione anagrafica delle banchine di ormeggio da parte della scrivente;
b) Nella sezione "DFSE Statistics", statistica mensile dell'andamento della produzione del gas CO2 filtrato per ogni porto ed anno di riferimento, rappresentato su istogramma a barre o grafico a linee;
c) Nella sezione "DFSE CO2 Map", dettaglio dei gas prodotti selezionando una nave dalla mappa generale;
d) Webservice Anagrafica Navi che restituisce il dettaglio anagrafico della nave, interrogando per IMO il catalogo dati IHS Markit;
e) Webservice Anagrafica Viaggi e relativa sezione di visualizzazione dati;

Il sottoscritto Natale Cuoccio, in qualità di funzionario assegnato al Dipartimento Sviluppo e Innovazione Tecnologia, ha effettuato alle ore 8.45 l'attività di verifica delle attività di manutenzione evolutiva previste.

VERIFICA MANUTENZIONE EVOLUTIVA

A. Estensione dell'applicativo al Porto di Termoli;

E' stata verificata l'estensione dell'applicativo al porto di Termoli:



B. Nella sezione "DFSE Statistics", statistica mensile dell'andamento della produzione del gas CO2 filtrato per ogni porto ed anno di riferimento, rappresentato su istogramma a barre o grafico a linee;

E' stata verificata l'implementazione delle statistiche mensili e per periodo selezionato dell'andamento della produzione del gas CO2:

Figura 1 - Menù di selezione tipo grafico

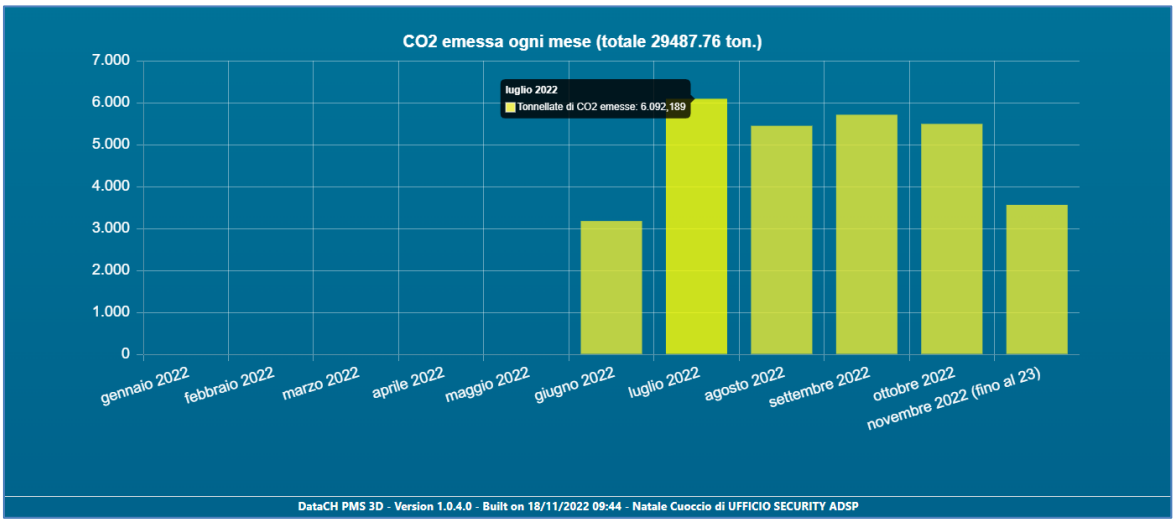
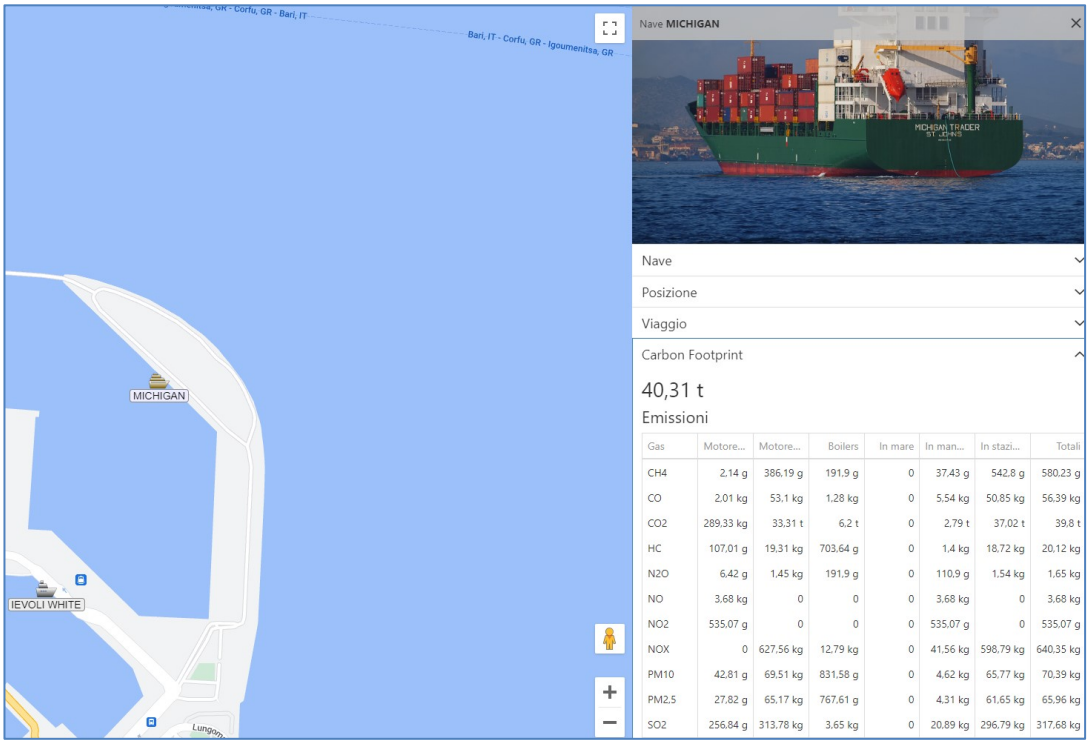


Figura 2 - Grafica a barre emissione CO2

C. Nella sezione "DFSE CO2 Map", dettaglio dei gas prodotti selezionando una nave dalla mappa generale;

E' stata implementato il dettaglio dei gas prodotti alla selezione su mappa della singola nave:



Gas	Motore...	Motore...	Boilers	In mare	In man...	In stazi...	Totali
CH4	2,14 g	386,19 g	191,9 g	0	37,43 g	542,8 g	580,23 g
CO	2,01 kg	53,1 kg	1,28 kg	0	5,54 kg	50,85 kg	56,39 kg
CO2	289,33 kg	33,31 t	6,2 t	0	2,79 t	37,02 t	39,8 t
HC	107,01 g	19,31 kg	703,64 g	0	1,4 kg	18,72 kg	20,12 kg
N2O	6,42 g	1,45 kg	191,9 g	0	110,9 g	1,54 kg	1,65 kg
NO	3,68 kg	0	0	0	3,68 kg	0	3,68 kg
NO2	535,07 g	0	0	0	535,07 g	0	535,07 g
NOX	0	627,56 kg	12,79 kg	0	41,56 kg	598,79 kg	640,35 kg
PM10	42,81 g	69,51 kg	831,58 g	0	4,62 kg	65,77 kg	70,39 kg
PM2,5	27,82 g	65,17 kg	767,61 g	0	4,31 kg	61,65 kg	65,96 kg
SO2	256,84 g	313,78 kg	3,65 kg	0	20,89 kg	296,79 kg	317,68 kg

Figura 3- dettaglio gas prodotti dalla nave selezionata

D. Webservice Anagrafica Navi che restituisce il dettaglio anagrafico della nave, interrogando per IMO il catalogo dati IHS Markit;

   E' stato implementato il Webeservice Anagrafica Navi che restituisce il dettaglio anagrafico della nave, interrogando per IMO il catalogo dati IHS Markit:

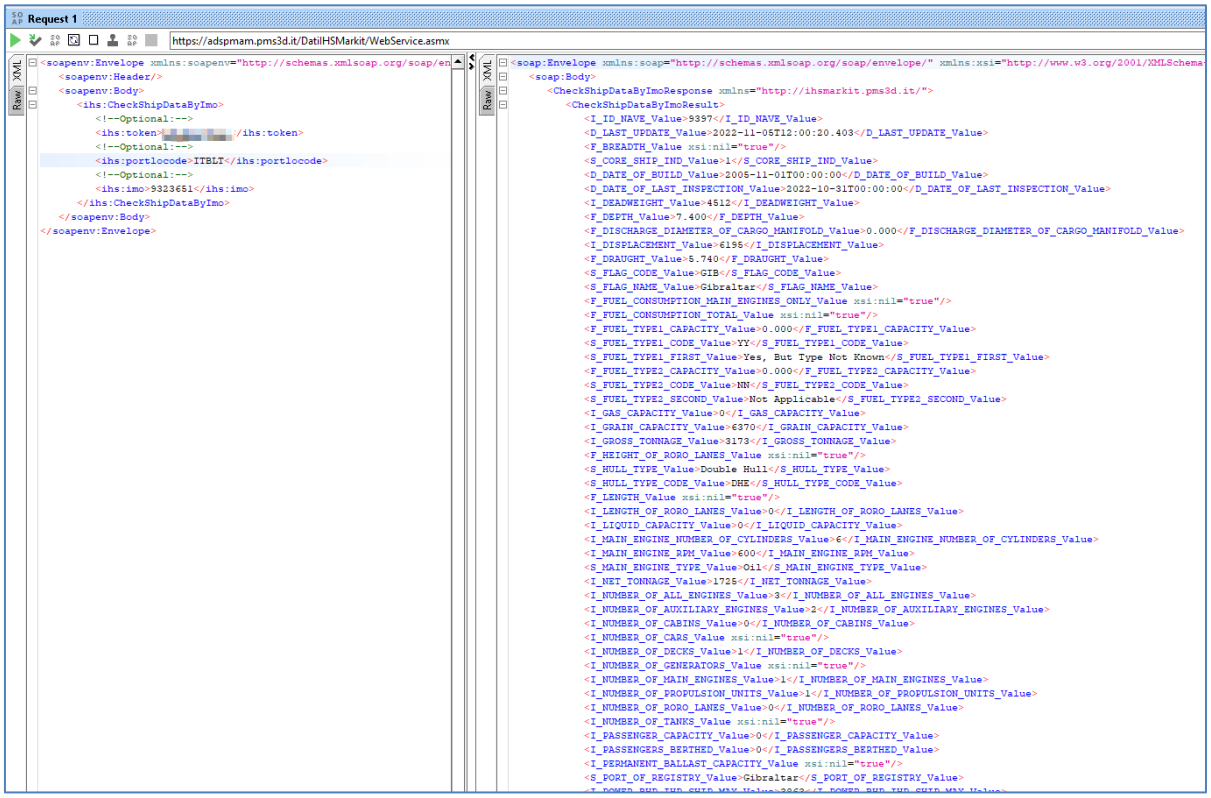


Figura 4 – SoapUI - Request Webservice

E. Webservice Anagrafica Viaggi e relativa sezione di visualizzazione dati;

E' stato implementato il Webservice Anagrafica Viaggi e la relativa sezione di visualizzazione dati:

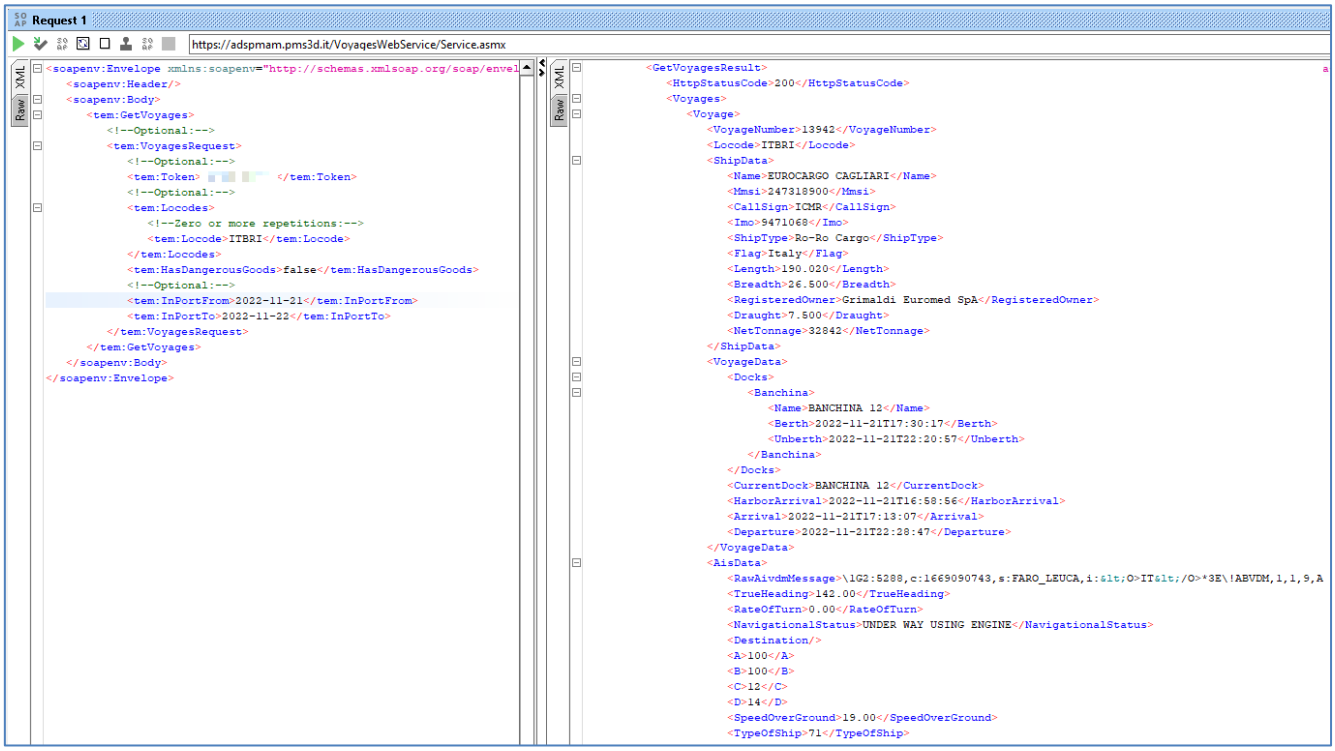


Figura 5 – SoapUI- Request Webservice

Figura 6 - Elenco Navi e Viaggi

Alle ore 11.30 del 23/11/2022 è terminata l'attività di verifica.

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Sulla base delle verifiche effettuate, si conferma la conclusione delle attività di manutenzione evolutiva dichiarato dal fornitore nel documento in atti prot. n.35074 del 21/11/2022.

Letto, approvato e sottoscritto

Bari, 23/11/2022

Natale Cuoccio