

Port of Rafina

The Port of Rafina is located on the suburban town of Rafina in the north-eastern coast of Attica in Greece, is particularly active in recent years in greening its activities and is seeking sustainable solutions for the green development of the port while respecting the local biodiversity, the local community and the needs of the stakeholders.

Rafina port belongs to the Trans-European Transport Network (TEN-T network) and it connects north-eastern Attica with the Cyclades islands (Tinos, Andros, Mykonos etc) and with Marmari of Evoia island via both RO-PAX and Highspeed vessels, serving both passenger/tourist and commercial traffic for all the above-mentioned destinations.

The implementation of alternative fuel technologies, as the studies of these are conducted through EALING program, will improve the sustainability of the port and at the same time will reduce its environmental footprint aiming at fulfilling the European Green Deal Climate Action principles and particularly the climate plan's 55% net reduction target.



Description of the SSE technical studies

The port of Rafina makes the next steps towards the implementation of Shore Side Electricity (SSE) technology via the EALING project. In the framework of EALING, the port of Rafina has performed the Front – End Engineering Design Study (FEED) for four (4) berthing positions at the Passenger Terminal:

SSE berthing position	Power (MVA)	Voltage (kV)	Vessel Type
1	1.5	12	Ro-Ro
2	1.5	12	Ro-Ro
3	1.5	12	Ro-Ro
4	1.5	12	Ro-Ro



The shore side installations for the Rafina Shore Side Electricity system include:

- One (1) Shore Connection Substation
- The underground MV and LV cables between the substation and the shore connection points, with all the necessary civil work
- Four (4) Cable Management Systems (CMSs)





Environmental studies

The cold ironing facility is in alignment with the envisaged land uses of the approved master plan of the port of Rafina while it fully complies with the approved environmental terms of the port of Rafina, as in force. The operation of the said SSE facility has an important positive effect on the environment through its positive contribution to the reduction of the rate at which climate change is taking place.

The resulted limitation in the use of the ships' engines while in the port has a very important positive local effect, due to the reduced concentration of pollutants in the air and the reduced noise level coming from ships auxiliary engines. This effect is of high importance given the vicinity of the city of Rafina to the port.

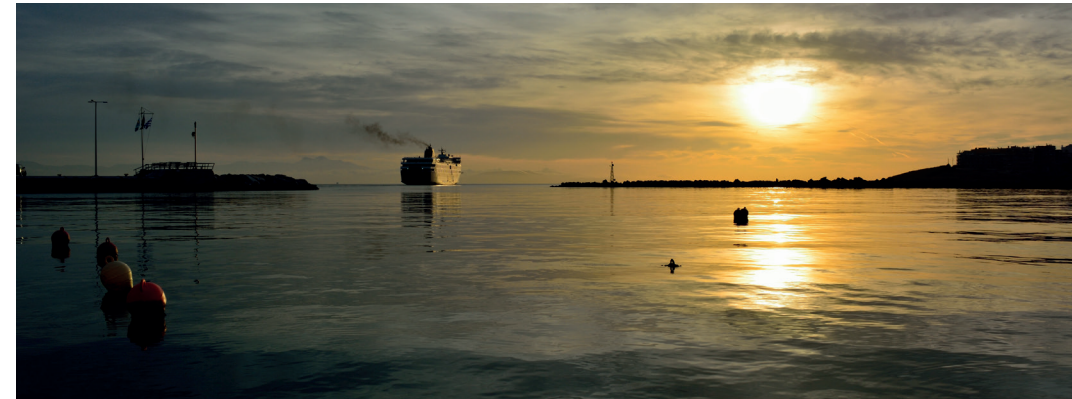
Furthermore, the impacts on the environment from the installation/construction works of the facility, although negative, they will be of negligible importance. The construction works, due to the short duration and the very small scale of the excavations required, will not have an important impact on the natural environment, human health, and landscape. In addition, due to the geomorphology in the area of the works, these will not be close residences or other city activities. It is also crucial in minimizing the impacts on the Rafina population and on the environment the fact that the required input power is of medium voltage.

In conclusion, overall, the installation and operation of the SSE facility in the port of Rafina will have an important positive effect on the local environmental conditions (air and noise), while it will also contribute to the global effort to reduce the rate at which climate change is taking place. Any negative impacts during construction phase are negligible and of extremely short duration.

Clean Power Supply Plan

Regarding the supply of clean power, the port plans to cover the energy demand through green energy sources either locally (within or nearby the port) or somewhere else and injected in the Main National Grid of Greece.

In addition to the SSE plans, the Port has made a fairly extensive investigation of installing renewable energy sources in place of its jurisdiction. Interest has been focused mainly on Photovoltaics (PV). Due to significant space limits, it has been concluded that for the time being the installation of PV panels is feasible only in the roof of buildings that belong to the Port. In addition, some energy savings can be attained by implementing some courses of actions like installing, programming and adjusting Building Management Systems in the buildings, or Energy Management systems for the entire electric network of the Port.



Cost-Benefit Analysis and Blending Schemes

Main results	€
Total Investments (€)	6,065,989
Timeline (years)	2023-2047
Nº of calls requesting SSE for the full period studied	35,139
Financial Net Present Value (FNPV)	(- 4,845,600) €
Total CO2 emissions saved (tonnes)	48,794
Total NOx emissions saved (tonnes)	140,229
Total SOx emissions saved (tonnes)	361,408
Total PMx emissions saved (tonnes)	22,202