a holistic auditing & study on solutions of the ports power upgrade approach

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Ships at berth supplied with electricity, while their engines are shut-off, not polluting and disturbing; lighting on the external and internal areas of the port that operates depending on the intensity of the natural light and the need to increase luminance; power, water and gas meters that can be remotely controlled and measure the consumption on a real time basis, as well as inform of any potential failures.

These are just a few of the features of a modern port, with the ship's ability to work with her engines shut-off, being the most crucial result, as one of the most power – consuming activities within a port, with a significant environmental impact.

PROTASIS SA and **HYDRUS ENGINEERING LTD**, with the support of ELEMED Group, offer a holistic service for a port's upgrade, starting by auditing its facilities, reporting of the current situation and the quantification of its current and future needs, as well as the study of power upgrade and modernization solutions, which include the following sectors:

Light Control
Installation of low consumption lamps and central control of the lighting network, aiming at energy saving.

Telemetering
Central telemetering of power, water and gas, with the purpose of creating models of consumption behavior, models of saving, billing, as well as the ability of immediate warning for possible failures.

Asset Control
Monitoring and programming of works and equipment maintenance, monitoring of spare parts and reserves from renewable energy sources, control of supplies and agreements.

Charging Stations of Electric Vehicles
Centralized monitoring and control of the provided charging service for electric vehicles to the travellers, with combined parking and coverage of the needs of transportation within the port, at the same time.

Refrigerator power supply – reefers
The exploitation of the increased thermal storage capacity of refrigerators like reefers, with intermittent power supply can be incorporated within the holistic plan for a sophisticated management of the power demands of the port loads.

Operation of Cargo handling Cranes
Cargo handling electric cranes with their modern capabilities of regenerative braking have minimal energy consumption, despite the importance of the work they perform at a port.

Deployment of Renewable Energy Sources
Generation of (even minimal) amounts of electric energy via the installation of photovoltaic panels at available areas within the port jurisdiction (such as roofs and sides of buildings, covered parking places).

with power, we perform

Deployment of Electric Energy Storage Units

With the ultimate goal for the optimum exploitation of the electric energy (purchase at a low cost, storage of excessive power produced by the Renewable Energy Sources or by the regenerative braking of cranes and its distribution when requested, e.g. by interconnected ships at berth), the energy buffers form an important aid in the smart energy control of the port.

Power supply to ships from ashore (Cold Ironing)

Elimination of transmitted emissions and noise of ships at berth with electric interconnection (cold ironing) at a frequency of 50/60 Hz and at different levels of voltage and power, as well as ship power charging, using batteries.

The studies that can be carried out for cold ironing, specifically, include:

- **Feasibility Study for the installation of "Cold Ironing" Systems, which includes the estimation of cost/benefit of investing and the availability of suitable funding tools to realize the investment.**
- **Front End Engineering Design (FEED) Technical Study of "Cold Ironing" systems, as per IEC80005-1/2/3.**
- **System Study for the power capacity and the need to upgrade of each port electric network.**
- **Composition of Specifications and all required documentation for the Call for Tenders according to the Legislation**

ELEMED - Electrification in the Eastern Mediterranean

ELEMED is a project, funded within the framework of CEF (Connecting Europe Facility), and it has included three member-states of the EU - Greece, Cyprus and Slovenia (https://www.elemedproject.eu/). Having LLOYDS REGISTER as its coordinator, the main contributors of the action were the NTUA – School of Naval Architecture and Marine Engineering, the companies PROTASIS SA and HYDRUS Engineering Ltd, the Piraeus Port Authority, the Port Authority of Killini and the Port Authority of Vasiliko Station in Cyprus.

The objective of the project was the cultivation of the know-how of ship-to-shore electric supply technology («Cold Ironing») and of hybrid and/or fully electrified ships (with electric propulsion and rechargeable batteries) in the East Mediterranean Seaway. Within this scope, and among others, the following were conducted:

- The study of the **Front End Engineering Design (FEED)** for the installation of the **"Cold Ironing"** system for two berthing places at each of the ports of Killini and Vasilikos, Cyprus, as well as fifteen berthing places at the passengers' department at the Port of Piraeus.
- The installation of one pilot application of "Cold Ironing" in one berthing place at the port of Killini.
- The investigation of the perspectives of modernization, through the electrification of ports and ships, with the purpose to correspond to the current trends for green and environmental friendly shipping.

The methodology of the project includes the recording and analysis of the "As-Is" status, in cooperation with the technical personnel of the Port and the investigation of the alternatives of a power upgrade at multiple levels, in relation to the current needs and the future development perspectives of the Port, the available technologies and the funding opportunities.

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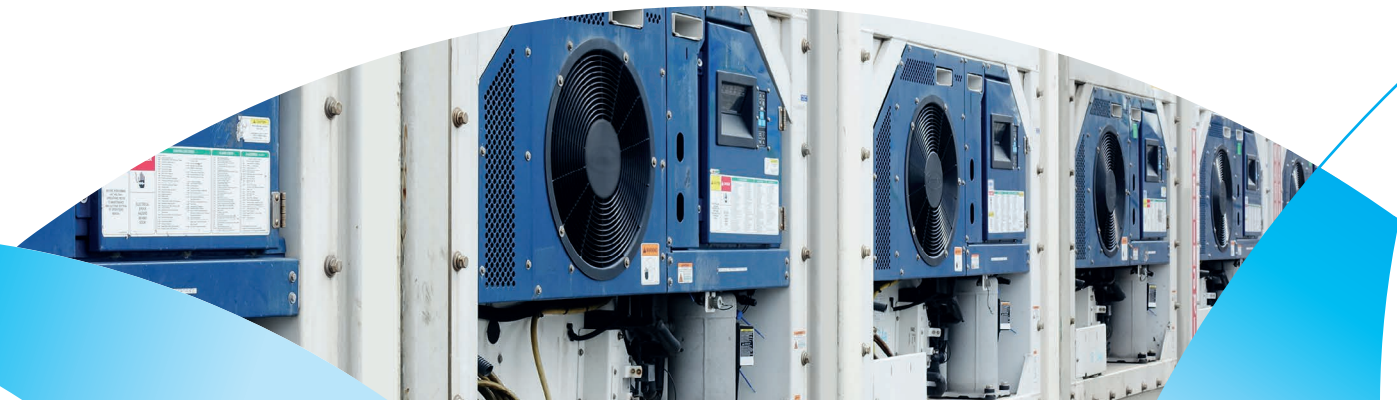


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