

Abstract

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Fuel Saving and Emissions Cut Through Shore-Side Power Concept for High-speed Crafts at the Red Sea in Egypt

The progress of economic globalization, the rapid growth of international trade, and the maritime transportation has played an increasingly significant role in the international supply chain. As a result, worldwide seaports have suffered from a central problem, which appears in the form of massive amounts of fuel consumed and exhaust gas fumes emitted from the ships while berthed. Many ports have taken the necessary precautions to overcome this problem, while others still suffer due to the presence of technical and financial constraints. In this paper, the barriers, interconnection standards, rules, regulations, power sources, and economic and environmental analysis related to ships, shore-side power were studied in efforts to find a solution to overcome his problem. As a case study, this paper investigates the practicability, costs and benefits of switching from onboard ship auxiliary engines to shore-side power connection for high-speed crafts called Alkahera while berthed at the port of Safaga, Egypt. The results provide the national electricity grid concept as the best economical Selection with 49.03 percent of annual cost saving. Moreover, environmentally, it could achieve an annual reduction in exhaust gas emissions of CO₂, CO, NO_x, P.M, and SO₂ by 276, 2.32, 18.87, 0.825 and 3.84 tons, respectively.