

Master's Thesis

Electrification of Artisanal-Fishing Boats in Cape Verde

Lucas Mário Freixo da Costa Dias — 2024

Key information

Authors:

Lucas Mário Freixo da Costa Dias (<u>Lucas Mário Freixo da Costa Dias</u>)

Supervisors:

Paulo José da Costa Branco (<u>Paulo José da Costa Branco</u>); José Luís Costa Neves (<u>José Luís</u> Costa Neves)

Published in

12/06/2024

Abstract

Decarbonization is a global priority, and Cape Verde aims to reduce carbon emissions across various sectors, including small-scale fishing. Currently, the artisanal fishing boats in Cape Verde rely on fossil fuels, contributing to greenhouse gas emissions and ocean acidification. Transitioning to electric or hybrid propulsion systems presents a promising solution, despite the challenge of limited range for electric boats.

This thesis investigates the feasibility of converting an existing gasoline-powered fishing vessel in Cape Verde to hybrid and fully electric propulsion, analyzing market options and custom battery configurations to evaluate costs, fuel savings, and conversion practicality. A dynamic model using resistance prediction methods simulates real-world fishing scenarios by incorporating environmental variables like currents, wind, and waves, allowing for the analysis of their impact on hydrodynamic drag and energy consumption, while also assessing the feasibility of integrating photovoltaic panels as a renewable energy source to reduce reliance on



This thesis successfully predicts powertrain demands in real-world scenarios using a robust Numerical Model, confirming the conversion viability. Despite challenging maritime conditions, integrating photovoltaic panels improves efficiency, reduces battery size, and supports gridindependent charging.

Publication details

Authors in the IST community:



Lucas Mário Freixo da Costa Dias ist1105706

Supervisors of this institution:



Paulo José da Costa Branco ist13330



José Luís Costa Neves ist147531

Fields of Science and Technology (FOS)

electrical-engineering-electronic-engineering-information-engineering - **Electrical engineering**, **electronic engineering**, **information engineering**

Publication language (ISO code)

eng - English

Rights type:

Embargo lifted

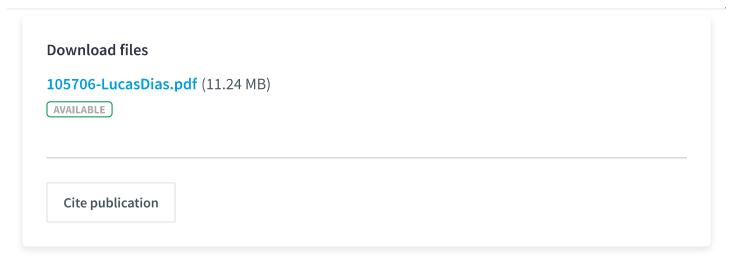
Date available:

09/30/2025

Institution name



Q



Powered by FenixEdu™

User manual

CO-FINANCED BY:

Support materials

Support

Open Access Policy







FAQ

2022-2025 © Instituto Superior Técnico