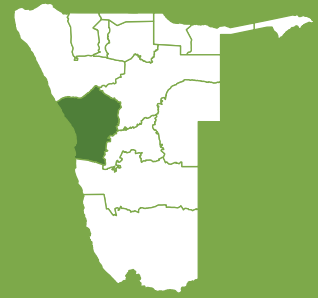


Project 1

Project Name	Green Hydrogen Applications in the Port Environment
Location	Walvis Bay Port
Project Size	5 MW Electrolyser and H2 mobile refueller (945kg at 500bar)
Project Value	5.66 million EUROS
Project Partners	Cleanergy Solutions Namibia, CMB Germany GmbH & Co. KG, and Namport, UNAM



Project Overview

This demonstration project is an initiative of Cleanergy Solutions Namibia, CMB Germany GmbH & Co. KG and Namport to decarbonize port-logistics, reduce the port's carbon footprint, and use alternative fuels, i.e., hydrogen, which allows port operations to transition to low carbon operations. This will enable an ecosystem, built around Green Hydrogen. This project accelerates the adoption of hydrogen applications within Namibia, by tackling both the refueling infrastructure, and providing captive usage of hydrogen.

This will be the first application to use hydrogen as a fuel in Namibia. This project will be the first African port project to implement hydrogen powered tugboats and heavy-duty port equipment, as well as being the first port in Africa to supply green hydrogen for bunkering vessels and refueling equipment.

The project aims to boost the transition of the international port industry toward a low carbon and safe operation model. The main objective of this project is to demonstrate port a equipped with hydrogen technology, using locally produced Green Hydrogen as an energy independent, and low-cost fuel via innovative, and cost-effective solutions that will be ready for market adoption by the end of the project. The benefit of this project is directly linked to the Harambee Prosperity plan II.

The following are strategic targets of this project, which will be realized by Cleanergy Namibia & CMB Germany GmbH & Co. KG with support from Namport:

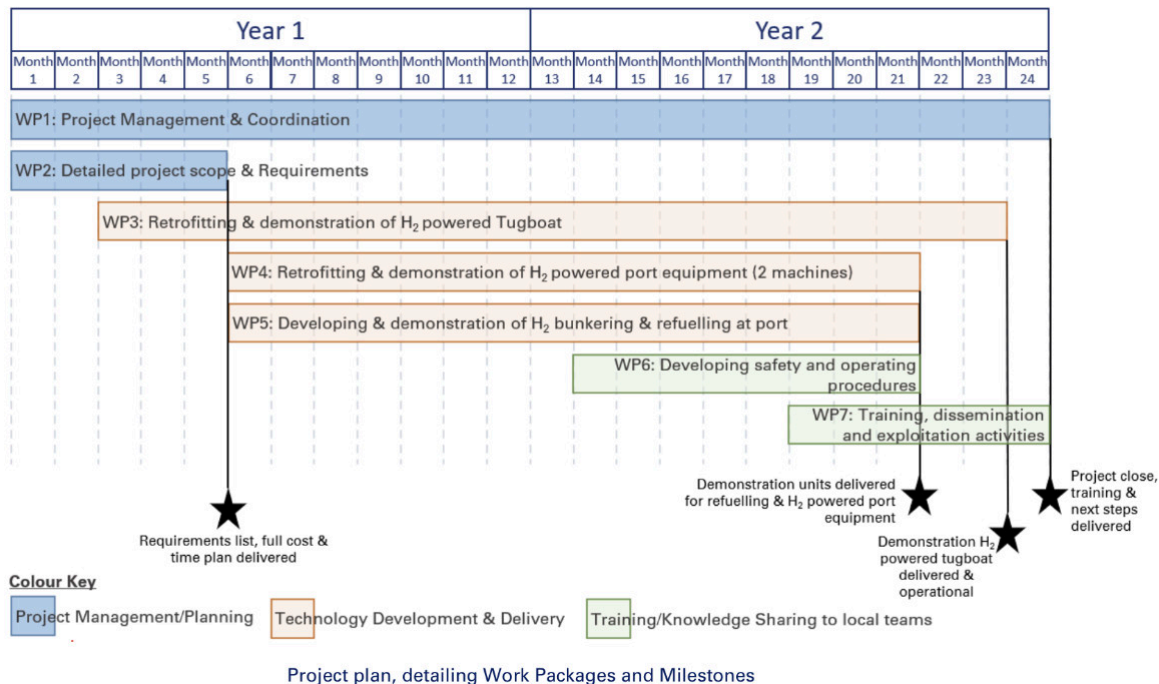
- To convert an existing tugboat to operate on hydrogen dual fuel technology
- To convert existing port equipment to operate on hydrogen dual fuel technology
- To develop Green Hydrogen bunkering and refueling infrastructure at the port
- To develop safety and operation procedures for use of hydrogen at ports
- To elevate the Germany-Namibia partnership, covering the whole value chain for Green Hydrogen and to promote the technological solutions proposed
- To increase public awareness towards Green Hydrogen
- To up-skill local work force to operate, service and repair hydrogen equipment
- To disseminate the project learnings through local educational institutes and publishing articles

Current Stage

Early feasibility is already performed showing the potential to use Green Hydrogen on port equipment.

Discussion ongoing with Namport and other port users for converting existing equipment into dual fuel systems.

Development Timeline (split per quarter)



Impact

Estimate no. Of jobs	Not Indicated
Unique Value	Transport - hydrogen usage at a port

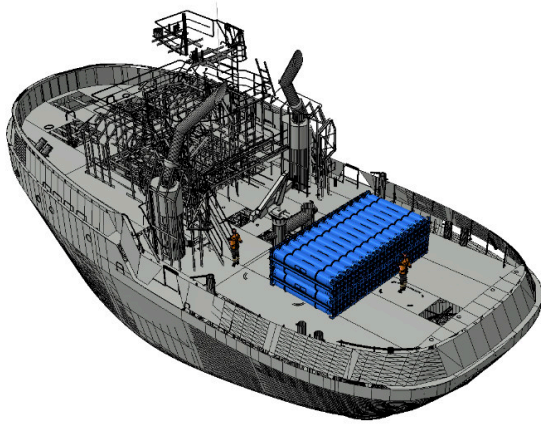
Sustainable Development Goals (SDGs)



Contact Details

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Project Pictures



Feasibility to install 400kg H₂ storage at aft deck



Photo of Onkoshi, DAMEN ASD 2910 tugboat, taken on 30/03/22 at the Port of Walvis Bay



SPECIFICATION	
ENGINES	- MEDIUM SPEED BEHYDRO ENGINES
POWER	- 2X 2MW
H ₂ STORAGE	- 400KG
H ₂ PRESSURE	- 35MPa
CERTIFIED BOLLARD PULL AHEAD	- 65 TONNES
GROSSTONNAGE	- >500GT
AFTERTREATMENT	- EU STAGE V (SCR + PDF)



Examples of a port equipment operated in Walvis Bay which could be retrofitted with dual fuel technology

Project Pictures



CMB.TECH H2 tube trailer bunkering Hydrocat (H₂ dual fuel crew transfer vessel)



Hydrogen tube trailer bunkering/refuelling panel

The visualisation below shows the shore side mobile H₂ refueller with dual fuel truck alongside H₂ dual fuel port equipment (straddle carrier & gantry) as well as H₂ dual fuel tugboat:

