

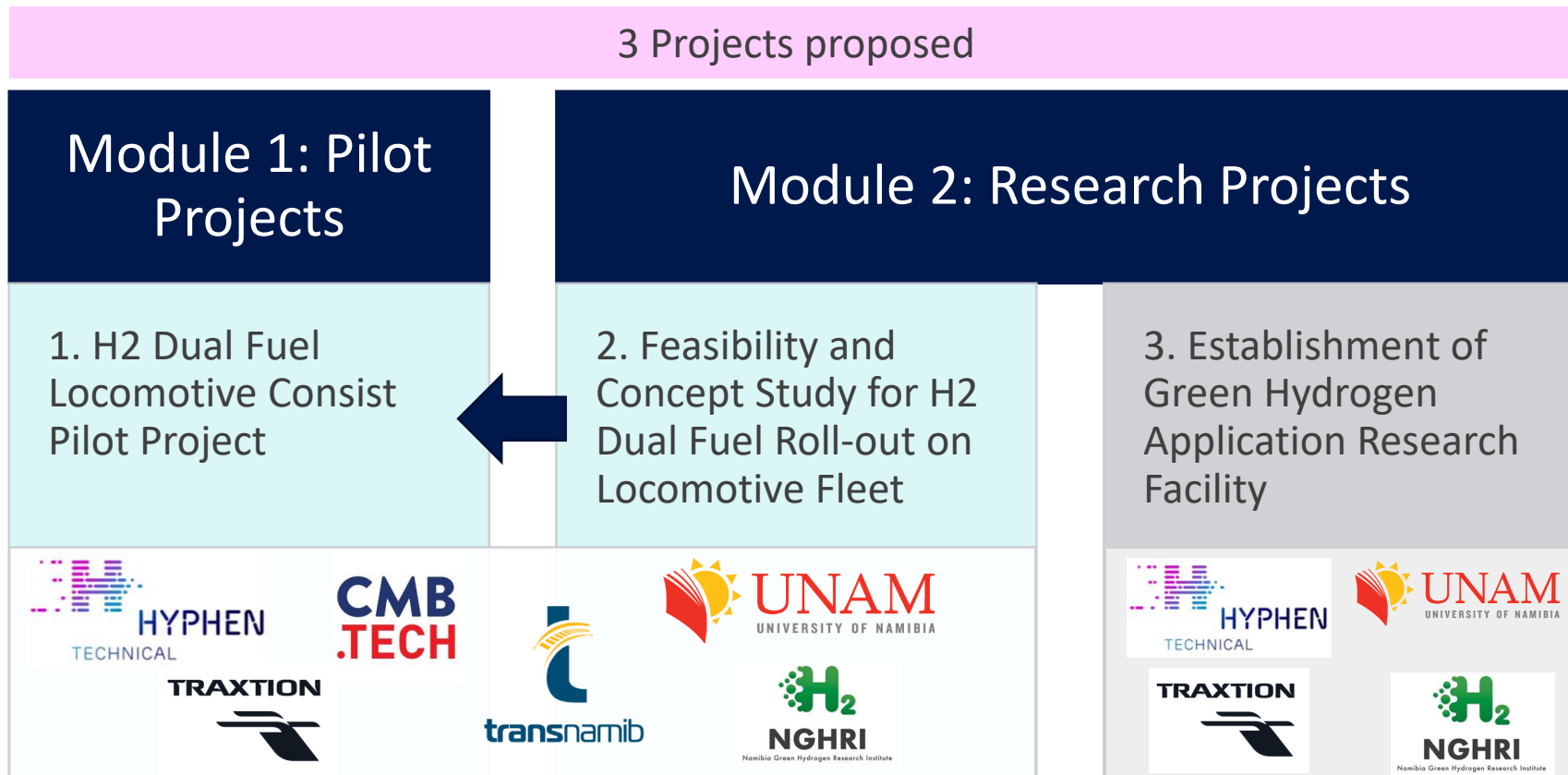


# Hydrogen Dual-Fuel Locomotive Demonstration Project for Namibia

Collaborative Proposal for  
the GH<sub>2</sub> Namibia JCol  
Funding Programme

# Proposed Projects

Hydrogen Locomotive Development with Research Feasibility study and Green Hydrogen Application Research Facility establishment



Supporting Members

# Project Brief – Pilot Project

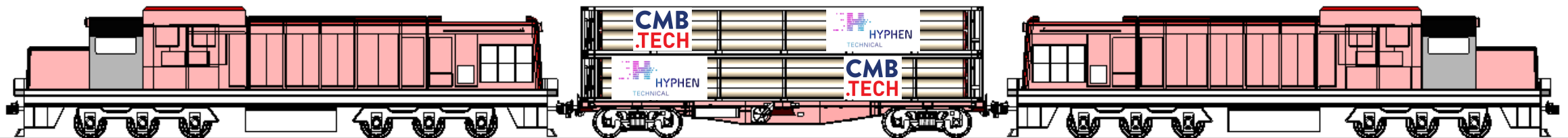
- **Name:** Hydrogen Dual Fuel Locomotive Pilot Project (Demonstration)
- **Project Location:** Walvis Bay to Kranzberg Rail Line (~210km one-way, ~420 km roundtrip)
  - TransNamib current line operator, with fleet of C23 and U20C locos.
  - Commodities transported: Various including Fuel, copper concentrate, containers, wheat, acid, and others
- **Project Description:**
  - The conversion of 2 locomotives to operate with green H<sub>2</sub> fuel in dual-fuel mode, including design, build, test, commissioning and operation of the locomotive and H<sub>2</sub> fuel tender car.
  - H<sub>2</sub> fuel to be provided by CMB.TECH Walvis Bay GH<sub>2</sub> project, at one end of the targeted route.
- **Technology:**
  - H<sub>2</sub> Dual Fuel technology from CMB.TECH, implemented on 1) existing medium speed engine and 2) in custom repower engine that is H<sub>2</sub> ready. Includes engine H<sub>2</sub> control and monitoring equipment and fuel tender vehicle for H<sub>2</sub> fuel storage.
- **Timeline and Cost:**
  - Locomotive trial ready - **18 months from project start**
  - Project Budget: **EUR 7.63 million**

## General Details:

- 1x C30EMP donor loco contributed by Traxtion,
- 1x U20C donor loco contributed by TransNamib/Traxtion
- 1x Locomotive Engine conversion kit
- 1x new H<sub>2</sub>-ready engine replacement for repower.
- 45ft Fuel Tender flat wagon
- 2x H<sub>2</sub> Storage half height 45ft units (type 1 - steel)

## Key Targets

- Maintains similar or better operational range than with diesel only.
- Maintains required power output or better per locomotive.
- Maintains axle mass limits allowed on rail lines (18.5 t/a, ±5%)



Loco 1 – H<sub>2</sub> Converted

Fuel Tender Wagon - 45ft Flatbed  
2x 45ft Half Height H<sub>2</sub> tube skids (type 1)

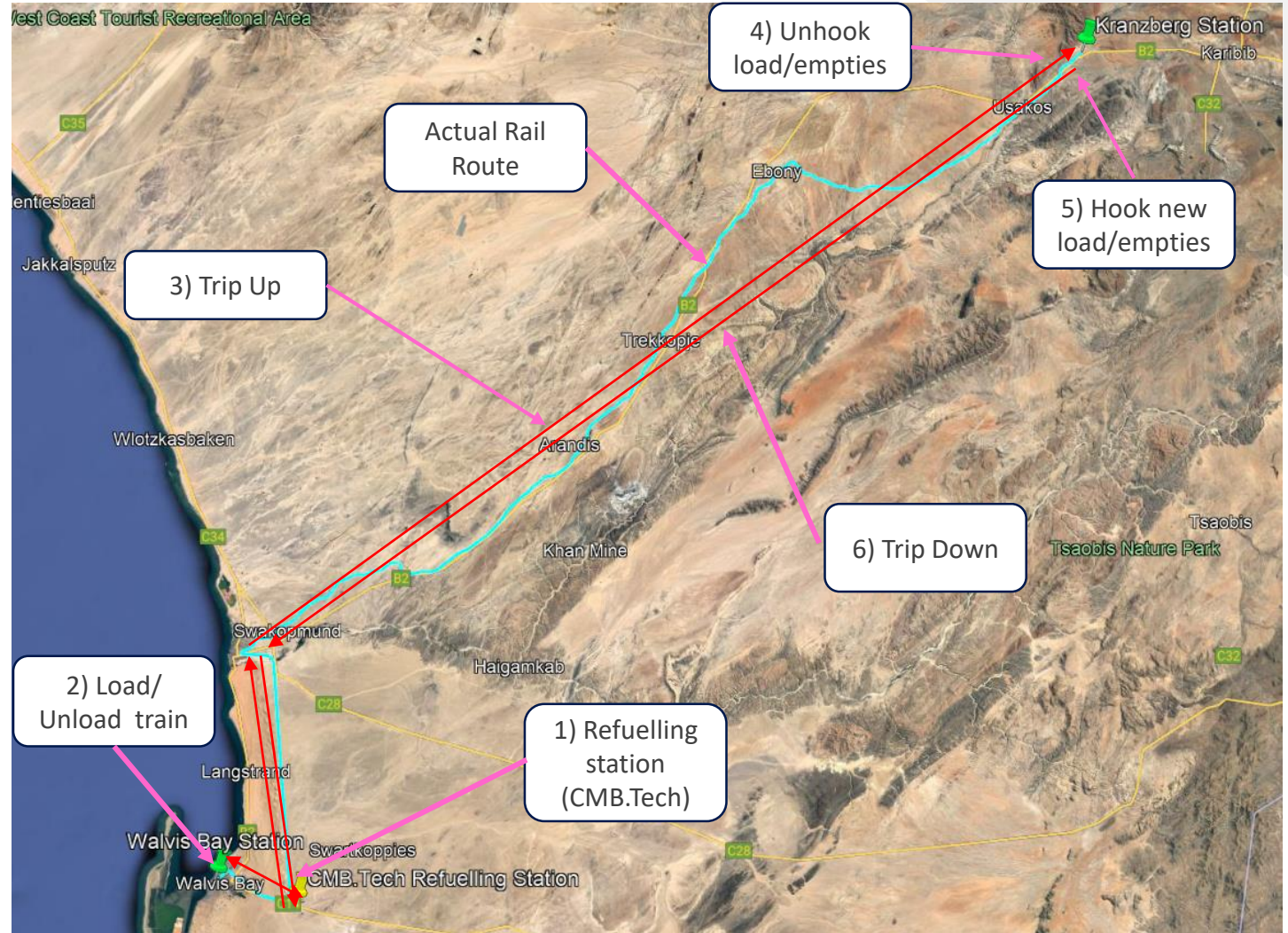
Loco 2 – H<sub>2</sub> Repowered

# Operational Concept

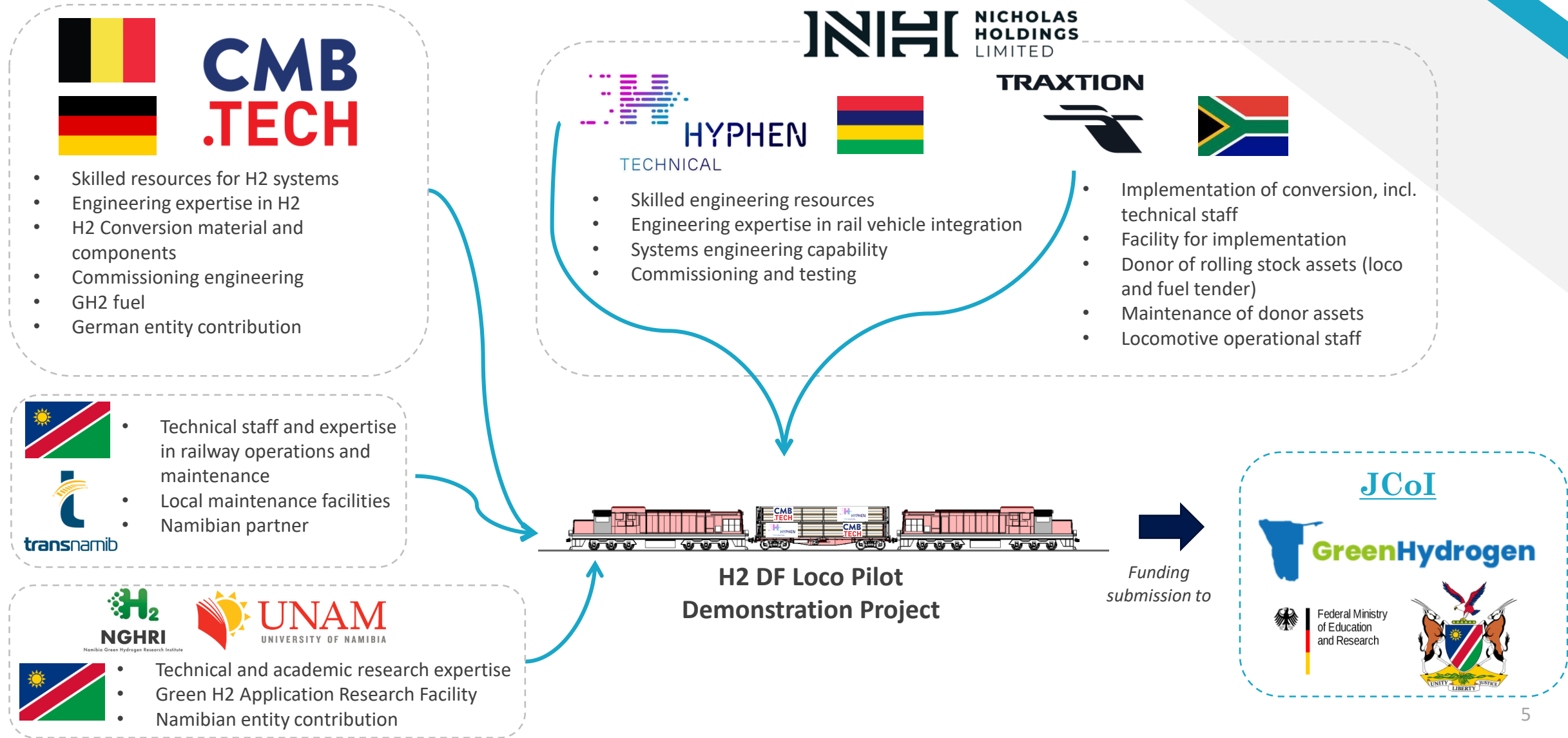
Route: Walvis Bay – Kranzberg (+ return)

## Operational Description

1. Refuelling at CMB.TECH Green Hydrogen Plant and Multi Modal refuelling station
2. Train loaded and coupled in Walvis Bay (WVB) yard.
3. Trip to Kranzberg (KZB) via Swakopmund (SWM)
4. Unhook load at KZB
5. Hook new load (loaded or empty) at KZB
6. Trip back to WVB via SWM.
7. Refuelling at CMB.TECH Green Hydrogen Plant and Multi-Modal refuelling station or via mobile refueller.



# Collaboration Structure





# Thank You

## Consortium Coordinator



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