

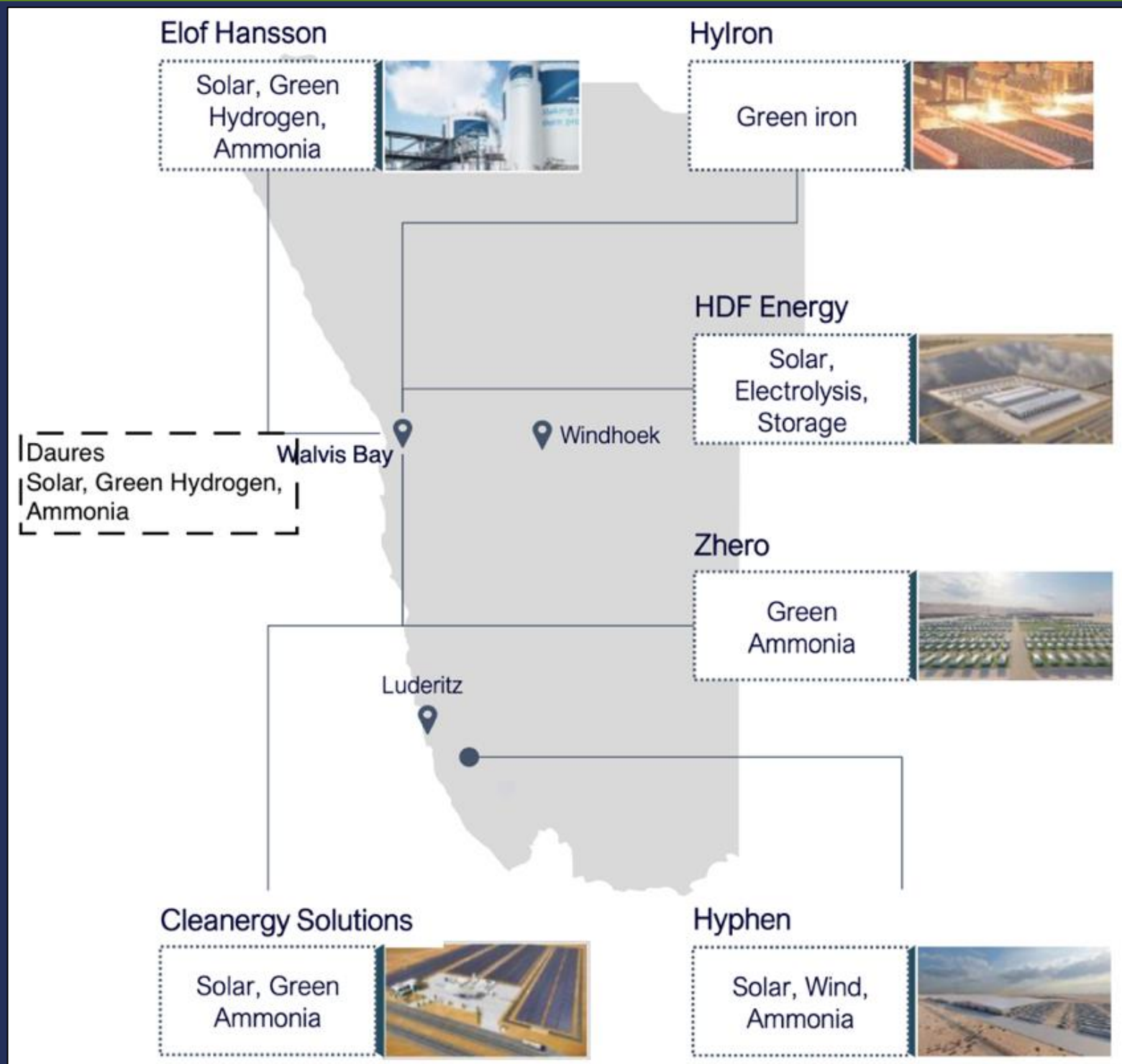


IMO-UNEP-Norway

INNOVATION FORUM

2024

24-25 October 2024 - IMO HQ hybrid event (live in person & online)



Project Name	Sector	Projected Scale
Hyphen Hydrogen Energy	<ul style="list-style-type: none"> Green Hydrogen and Green Ammonia for international export and input into local for green industrialization as per GIB 	<ul style="list-style-type: none"> 6-7 GW renewables 3 GW electrolysis 2 Mtpa Green Ammonia
HDF	<ul style="list-style-type: none"> Green Hydrogen serving green baseload power to 140 000 Namibians thereby contributing to increased local electricity generation within the country. 	<ul style="list-style-type: none"> Grid ancillary services 140 GWh of electricity p/a- serving green baseload power to 140 000
Hyiron - Oshivela	<ul style="list-style-type: none"> Direct Reduced Iron (DRI) for Green Steel manufacturing 	<ul style="list-style-type: none"> 2 Mtpa Green DRI
Zhero Molecules	<ul style="list-style-type: none"> Green Hydrogen and Green Ammonia ready for local utilisation and export through the Port of Walvis Bay 	<ul style="list-style-type: none"> 500,000 tpa Ammonia 93,000 tpa Hydrogen
Cleanergy Solutions	<ul style="list-style-type: none"> Green Hydrogen and Green Ammonia for port decarbonization (tugboats, heavy-duty port equipment and ships) 	<ul style="list-style-type: none"> 5 MW electrolyser and Green Hydrogen mobile refueler (945 kg at 500 bar) during pilot phase.
Daures Green Hydrogen Village	<ul style="list-style-type: none"> Green Ammonia local and regional consumption for agricultural and other end user applications (2024-2026) Green Ammonia for regional and international export (2027 – onwards) 	<ul style="list-style-type: none"> 5 GW Solar, 420 MW Wind 2 GW electrolysis 190 000 t/a Green Hydrogen 1.08 Mtpa Green Ammonia

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Namibia Green Hydrogen Programme



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1. Cleanergy Solution (CMB.Tech and the O&L Namibia)



- Cleanergy targets to start construction of a €200 million Ammonia storage facility in Q1-2025
- Green Hydrogen production facility in Arandis and an Ammonia Synthesis plant on farm 58 adjacent to the hydrogen service station.
- Establish Walvis Bay as a Hub for Green Shipping, a preferred port of call for any ships looking to use green ammonia as a shipping fuel.
- CMB.Tech has already placed orders for 5 new very large crude carriers (VLCCs) under construction.
- The vessels are expected to be delivered in 2026 & Q1 2027 and will be ready to be powered by a dual-fuel diesel-ammonia engine.
- By the end of 2027 CMB.Tech expects to have 10 vessels ready to run on ammonia and some of which may start calling to port in Namibia.

Expansion Stages	Energy Requirement	Resulting CO2 Savings
First Production stage: 5 T/H – 3000 hours per year. Annual Production: 15000T - End of 2024	Approximately 25MW	<ul style="list-style-type: none"> • Approx.: 27,000 tons of CO2 abated • This corresponds to approximately 0.75% of the total annual CO2 emissions of Namibia
Second Production stage: 25 T/H – 8000 Hours per year (including energy storage) Annual Production : 200,000T - End of 2026	Approximately 260 MW	<ul style="list-style-type: none"> • Approx.: 360,000 tons of CO2 abated • This corresponds to approximately 10% of the total annual CO2 emissions of Namibia
Third Production stage: 250 T/H – 8000 hours per year Annual Production : /2,000,000T - End of 2028	Approximately 2600 MW	<ul style="list-style-type: none"> • Approx.: 3,600,000 tons of CO2 abated • Around 88 % of Namibia's annual CO2 emissions

2. Hylron - Oshivela

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