Namibia
Zhero Molecules Walvis Bay Project

- **Project Brief**
- **Status of Development and Timeline**
- **Key Challenges and Lessons Learnt**

World Bank Group
ESMAP Webinar Series - 9 Dec 2025
From Presentation to Projects
Namibia’s Experiance in Green Industrialisation

Project Brief - Zhero Molecules Walvis Bay Project

Project Sites and Location:

- ✓ Area 1 – **10ha** at Walvis Bay North Port (storage and loading facilities)
- ✓ Area 2 – **100ha** of industrial land in Walvis Bay Municipality (NH3 prod.)
- ✓ Area 3 – **5300ha** of farmland (Solar PV / BESS plant)

Physical Production:

- ✓ 500,000 tonnes per annum of green ammonia **(RFNBO Compliant)**

Timelines:

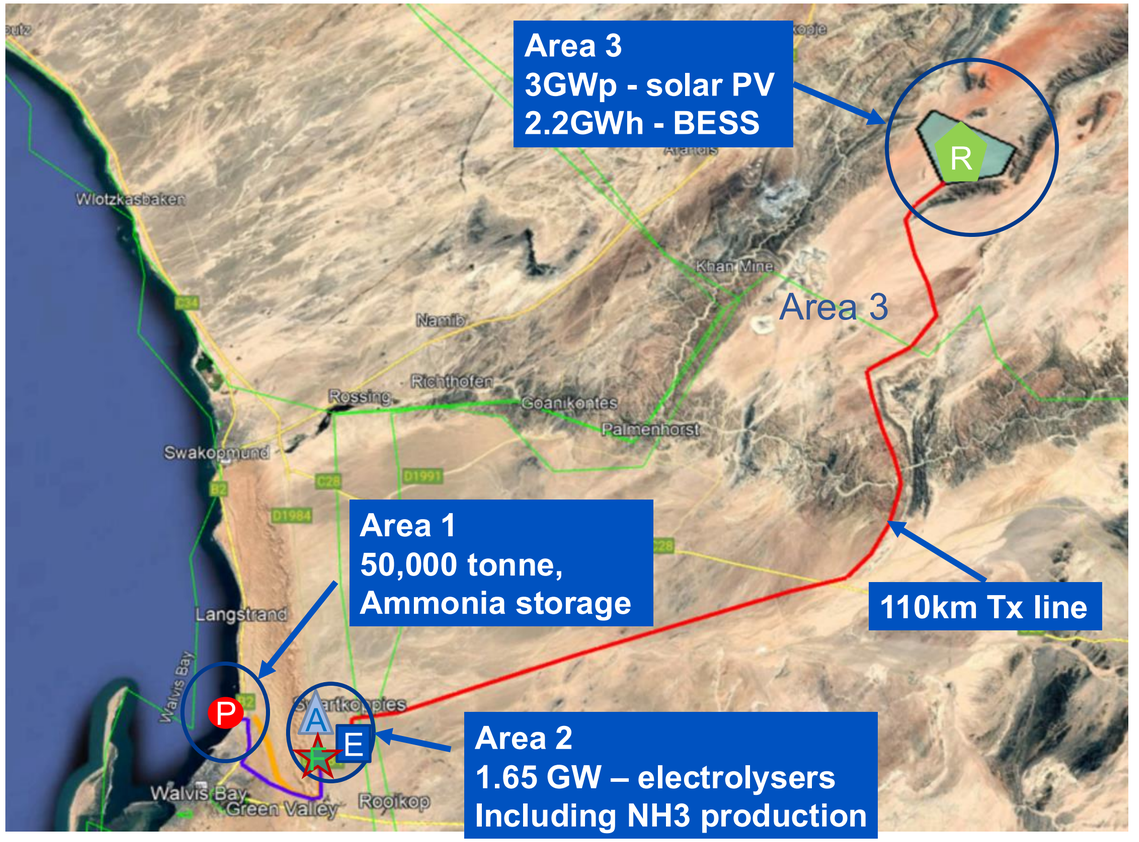
- ❑ Finance Close in **1st Quarter 2027**
- ❑ Commercial Operation in **1st Quarter 2030** with lifetime of 25 years

Why Namibia?

- ❑ World best **PV resource** and abundant land
- ❑ Well established and **stable political** and legal environment
- ❑ **Strong support** from Government to establish and grow a green economy
- ❑ Strong local partners with **ease of permitting** favorable vs other regions
- ❑ Project to ensure enduring benefit to **Namibia and its people**
- ❑ Walvis Bay is the **3rd largest port** in Sub-Saharan Africa with existing infrastructures that can be used to move equipment to Area 1,2 and 3.

Route to market:

- Export through an **existing and operating jetty** at Walvis Bay **(15m draft, 90,000DWT, 250m LOA).** Area is located right in front of the existing jetty.



Project Brief - Key merits of the Zhero Molecules Walvis Bay Project

Helping industrial clients to decarbonize in an affordable manner	✓ **Competitive Free-on-Board** price at Port of Walvis Bay, ready for shipmen to Ports in Europe or Asia. ✓ **RFNBO compliant molecule** with large carbon buffer to account for emissions from shipping as well as activities in the destination country. ✓ Offtake termsheets signed by **reputable entities for 80**% of production capacity.
Benefits to local communities	✓ **Training and development**: Partner with NGOs, DFIs, universities and vocational training centres to train and upskill **the local workforce** to ensure that local employment is maximised. ✓ **Local workforce:** approx. **4,700 FTEs job created** over 3 years for construction and **330 jobs created** for operations. ✓ **Social Upliftment:** A share of total project costs will be utilised to **improve the social conditions** (electricity and potable water supplies, education facilities and health services) of the local communities.
Economic development for Namibia	✓ Project directly supports **National Development Plan (NDP6) targets** of 1.3 mil tpa of green ammonia plus 30,000 new job created by 2030. ✓ **Fiscal and Economic Development:** Improves Government of Namibia's fiscus, GDP and trade balance through export of green ammonia plus its associated taxes. ✓ **Local Content:** Creates opportunities for local companies to provide goods and services to the EPC Contractors. ✓ **Green Industrialisation:** Availability of green hydrogen/ammonia at Walvis Bay supports the governments ambitions to industrialise the Erongo Region.
Supported from EU	✓ Zhero together with consortium of other institutions (**called Project ignite**) was awarded EUR 2mil for vocational education and training under the Global Gateway OP-VET tender.
Capital partnerships	✓ Strong interest from investors for equity and debt investment in the project.

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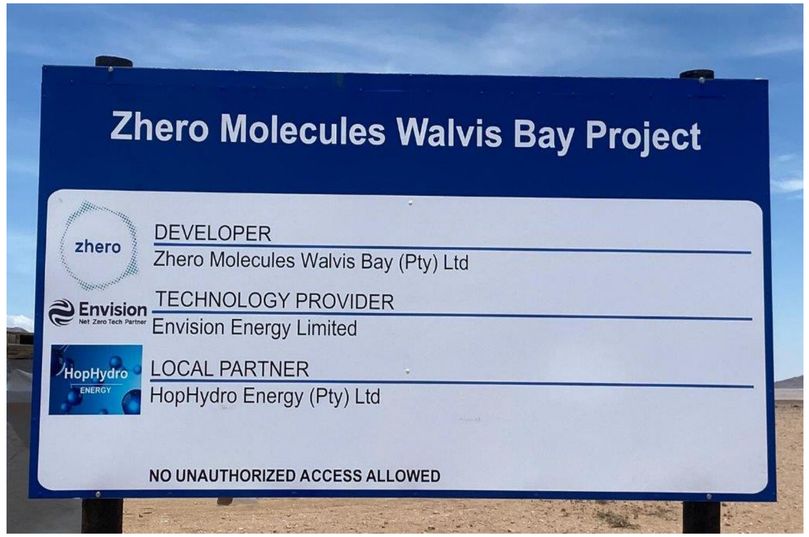
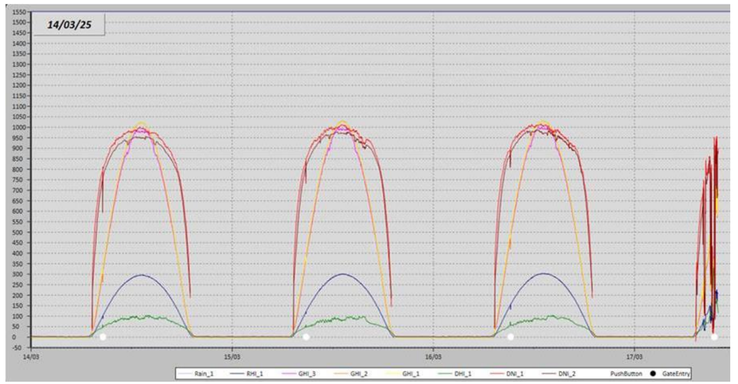
Status of Development – Where do We Stand?

Stream	Description	Achievement and Progress Update
Economics, Storytelling & Regulation	▪ Rationale of the project ▪ Financial Model ▪ Business case	▪ Produce low cost, RFNBO green ammonia for export to Europe or Asia. ▪ Bankable financial model confirming project viability completed. ▪ Project financing to be secured through **long term offtake agreements.**
Partners & Political Endorsement	▪ EU institutions ▪ National ▪ Strategic Partners	▪ Project recognized under the EU **Global Gateway strategic MOU** between Namibia and European Union. ▪ Project included in Namibia's **National Development Plan 6 f**or 2025 to 2030 targets. ▪ Envision appointed as technology partner and engineering services for FEED.
Project development	▪ Land: ▪ Environmental: ▪ Permitting	▪ **Land rights secured** in North Port (Area 1), Industrial Land (Area 2) and Farmland (Area 3). ▪ **ESIA approved** for solar PV, BESS and Tx line at Area 3**.** ESIA for desalination and hydrogen/ammonia part in **draft.** ▪ **Generation License Application** submitted in Q3 2025. Site Studies (i.e. geo-technical, hydrological etc) started in Q4 2025. **Plan to submit Tx License application in Q1 2026.**
Engineering & supply chain	▪ Pre-FEED studies ▪ FEED studies ▪ Suppliers interactions	▪ **Pre-Feasibility completed** and class III estimate finalized. ▪ Detailed **FEED and class II estimate scope** to commence in Q4 2025. ▪ Envision appointed as technology partner. Several EPC Contractors have been engaged for Solar PV & BESS scope.
Commercial	▪ Introductions ▪ Termsheets ▪ Contracts	▪ Strong interest from **>10 potential offtakers**. ▪ Termsheets signed with reputable offtakers **for 80% of production capacity.** ▪ Finalization of binding offtake agreements with **binding price planned** for Q3 2026.
Capital	▪ Devex funding ▪ EU Funds ▪ Debt financing	▪ Devex covered internally with past investment rounds and SDG-Namibia One Fund (**49% government** stake through EIF) ▪ As part of project IGNITE, zhero and the consortium received **EUR 2mil from EU Global Gateway** OP-VET tender for vocational education and training. ▪ Ongoing engagement with **multilaterals** (AfDB, EBRD, EIB, IFC), **ECAs and commercial banks** to secure funding**.**

Status of Development - Solar Resource Measurement Station





- Installation completed by **GeoSun and HopSol** on 14 March 2025.
- **Measurements include:**
  - ✓ Solar GHI (primary, secondary)
  - ✓ Solar DHI and RHI
  - ✓ Wind speed and direction (10m)
  - ✓ Temperature, humidity
  - ✓ Albedo & Soiling
- **Remote daily monitoring** on the station by GeoSun, with regular cleaning of sensors by site staff.

Status of Development - Timeline

Timelines (limited recourse basis)

Feasibility

- PRE-FEED Completed
- EIA and EMP compiled
- RFNBO compliance check
- Lenders engaged on draft Termsheet
- Offtakers engaged on non-binding TS drafted
- Shareholders engaged and agreement drafted
- PRE-FEED gate submission

Financial close (FC)

- FEED Completed
- EPC Contracts agreed
- Financing Agreements finalised
- Offtake agreements initialled
- Shareholders agreement finalised
- Land lease agreements finalised
- FID approval submission

Operations Period

- Detail Engineering
- Procurement
- Manufacturing
- Construction
- Commissioning

Nov 23 — BC — FID — FC — COD

7 months | 3 months | 36 months | 25 years*

- Complete plant configuration
- Finalise concept and description
- Assess feasibility
- Compile FM
- EIA Scoping compiled
- Business case approved

June 2024

7 months — Pre-FEED and Class III

24 months — DEVELOPMENT — FEED and BINDING EPC PRICE

Dec 2026

- Close Condition precedents
- Close financing documents
- Close all parties related contracts
- First drawdown (FC + 30 days)

Mar 2027

EXECUTION

Mar 2030

Key Challenges

Issue	Description	Consequences
Interministerial coordination	Absence of an interministerial coordination committee (previously Green Hydrogen Council)	Lack of interministerial coordination and support for strategic projects required to support National Development Plan 6.
Conflict of Rights with EPL holders	Exclusive Prospecting Licences (EPLs) can be acquired for an insignificant cost, allowing individuals to hold the rights on sub-soil mineral rights over large tracts of land for up to seven years.	The presence of EPLs and the process of acquiring new EPLs sterilizes land and makes it impossible to undertake any development on vast tracs of land.
Access to Servitudes	All large projects require servitudes over state-owned land for either pipelines or transmission lines connecting the various land parcels; especially where the renewable generation facilities and hydrogen production are located on separate sites.	The current process to develop and register a new servitude within Government is overly complicated, as it involves many different steps and currently there is no certainty on who is responsible in Government for the final approval of the servitude agreement.
Fiscal Regime	The current fiscal regime is outdated and does not support the development of large capital-intensive projects.	1) Current fiscal legislation does not incentivise developers to invest in Namibia. (Developers are waiting for Special Economic Zone and green hydrogen legislation) 2) Lack of clarity around the new legislation creates uncertainty for developers in their project modelling and business cases.
Government Stabilisation Framework	Most green hydrogen projects in Namibia will be developed on a Project Finance basis; where the key project agreements will be between corporate entities. Political risk (change in law, expropriation) will need to be addressed for the lenders.	Without a Government Stabilisation Framework, corporates will need to insure against political risk which may reduce competitiveness of the project.
Cost of both Equity and Debt	Risk premiums for investments and for lending to projects in Sub-Saharan Africa are significantly higher than for other regions of the world	Risk premium significantly adds to the cost of both equity and debt, thus adding more cost to the ammonia produced

Our list of Critical Success Factors

- Selecting **the right jurisdiction** with good solar and wind resource, port infrastructure and supportive government **is the first key decision.** (i.e. why Namibia?)
- **Involving Government** through an equity stake reduces overall project risk. (i.e. securing land access and title, removing Exclusive Prospecting Licences etc.)
- Engaging a reputable **Environmental Consultant, to provide a thorough** Environmental & Social Impact Assessment, ensures a credible ESIA process and enhances lender interest. (i.e. good stakeholder relations)
- **Designing a credible commercial and contracting structure** mitigates construction and interface risk (i.e. in the case of zMWB, one EPC contractor for the molecule scope and one EPC contractor for electron scope.)
- Securing reputable offtakers **unlocks further equity interest and development capital.**
- Partnering with a reliable local partner is **essential to unlock and accelerate** local permits and approvals.
- Selecting an **experienced and reputable technology partner** derisks technology and interface risk and provides comfort to lenders.
- Procuring EPC contractors that have a strong **reference list and balance sheet** to provide request warranties and performance guarantees.
- **Intentionally seeking to provide maximum value retention in-country** through the development and operation phases of this project to deliver economic and societal value is critical to not just secure this first project over its lifetime but to anchor this sector as a critical contributor to expand the economy of the country and establish a vibrant society

Zhero in a nutshell

Our Mission: deliver the most cost competitive green electricity / molecules to end customers developing large scale green energy projects in three business segments

Founders with deep development, construction & operating experience

Marco Alverà
Co - Founder

Alessandra Pasini
Co – Founder & CEO

Paddy Padmanathan
Co – Founder

Enrico Vitali
Co – Founder

+ Top class executive team supported by a network of senior advisors

Previous work experiences of the team:

TES, ACWA POWER, PAUL HASTINGS, Terna Driving Energy, citi, enfinity, snam, eni, enel, Goldman Sachs, Maire Tecnimont, European Bank for Reconstruction and Development, CanadianSolar

Backed by Top Tier Investors

Climate funds

GALVANIZE CLIMATE SOLUTIONS
three cairns group

Financial

GRUPPO AZIMUT – AZIMUT LA DIREZIONE PER INVESTIRE
UniCredit
BlackRock

Industrial

FORTESCUE FUTURE INDUSTRIES
TotalEnergies
Baker Hughes

Three business segments in key focus geographies

1 HDVC interconnectors

- **Medlinks: 10GW RES + 4GW HVDC** between **Italy** and **North Africa** (including **Algeria**) with a semi-baseload delivered profile.
- **NEEL**: early-stage development in the US
- **GulfLink:** multiparty MOU to study KSA-IT link

2 BESS & RES

- **Europe: 1.5 GW BESS Stand Alone** pipeline in Italy to be delivered by 2026
- **US:** Several projects across ISOs, under development for c.1.0 GW
- Technologies include onshore wind, PV and BESS

3 Green Molecules

- **Green Ammonia** project in **Namibia** (ca. 3 GW RES for up to 500k tonnes ammonia p.a., scale up available)
- USD-denominated revenues + creditworthy off-takers
- **TES**: strategic investment in the company with a focus on e-NG

www.zhero.net