



HYDROGEN
ENERGY

HYPHEN

Southern Corridor Development Initiative

Hyphen Project Status

Namibia Scientific Society

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Quiver Trees – Konkerboom Woud, Keetmanshoop Namibia
(Andreas Glockner)

Hydrogen Opportunity

Hyphen Project Summary

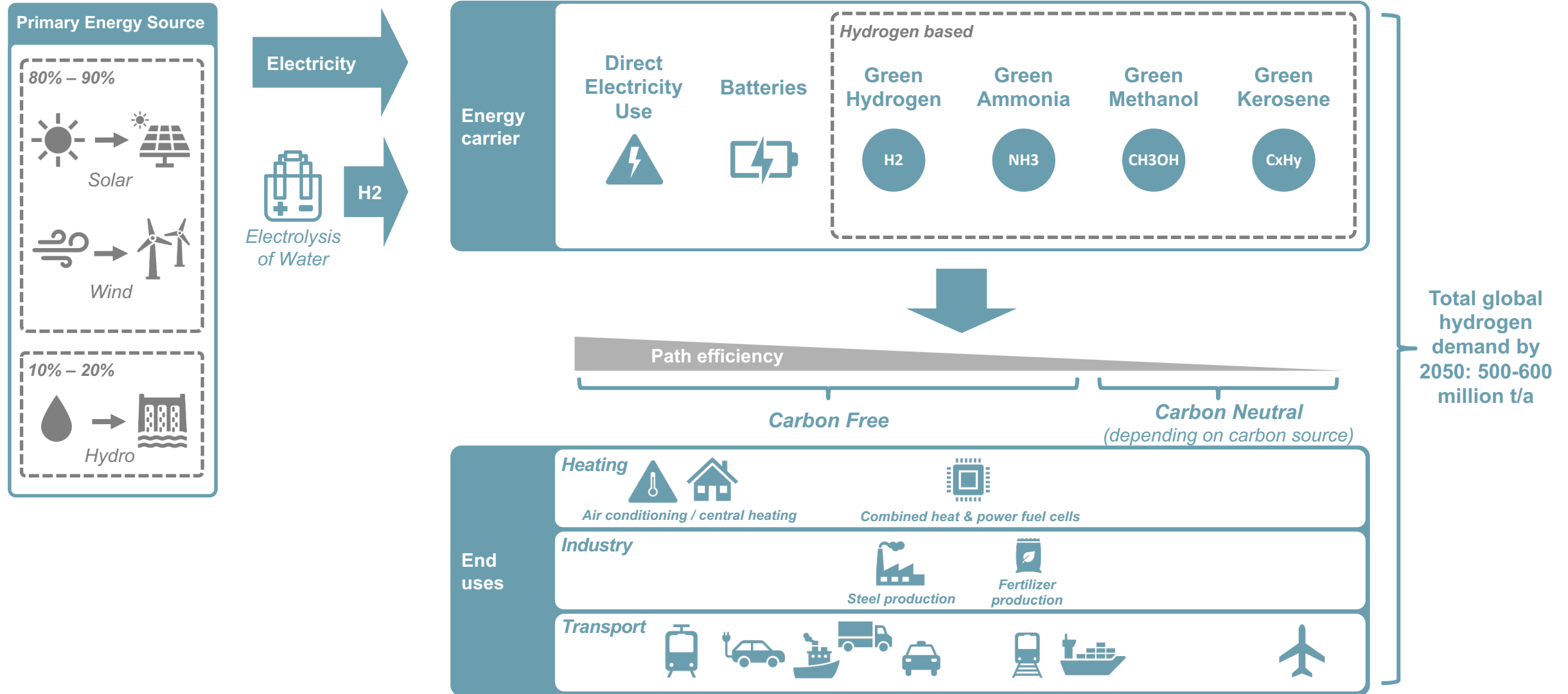
Impact for Namibia

Hydrogen Opportunity

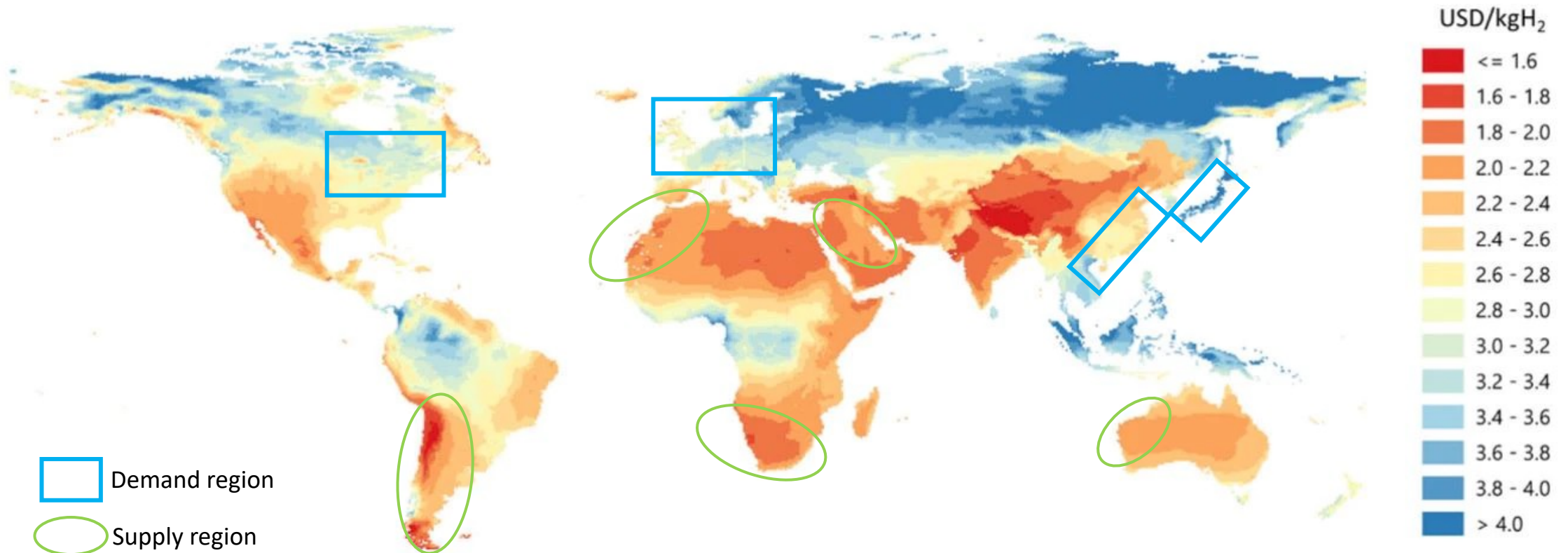
Hyphen Project Summary

Impact for Namibia

Solar, Wind and Hydrogen = Future Energy System



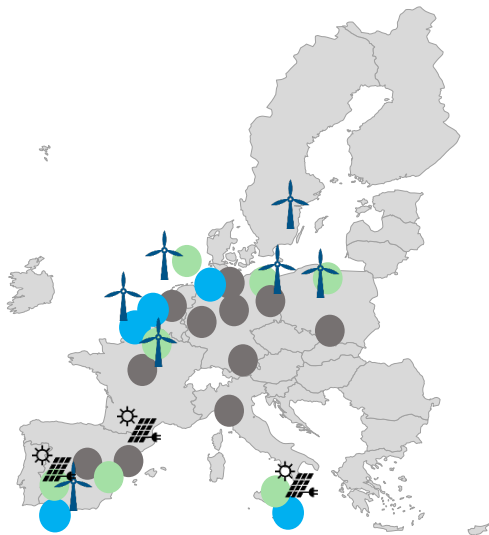
Hydrogen costs from hybrid solar PV and onshore wind systems in the long term



Namibia as a key supply hub for green-hydrogen products

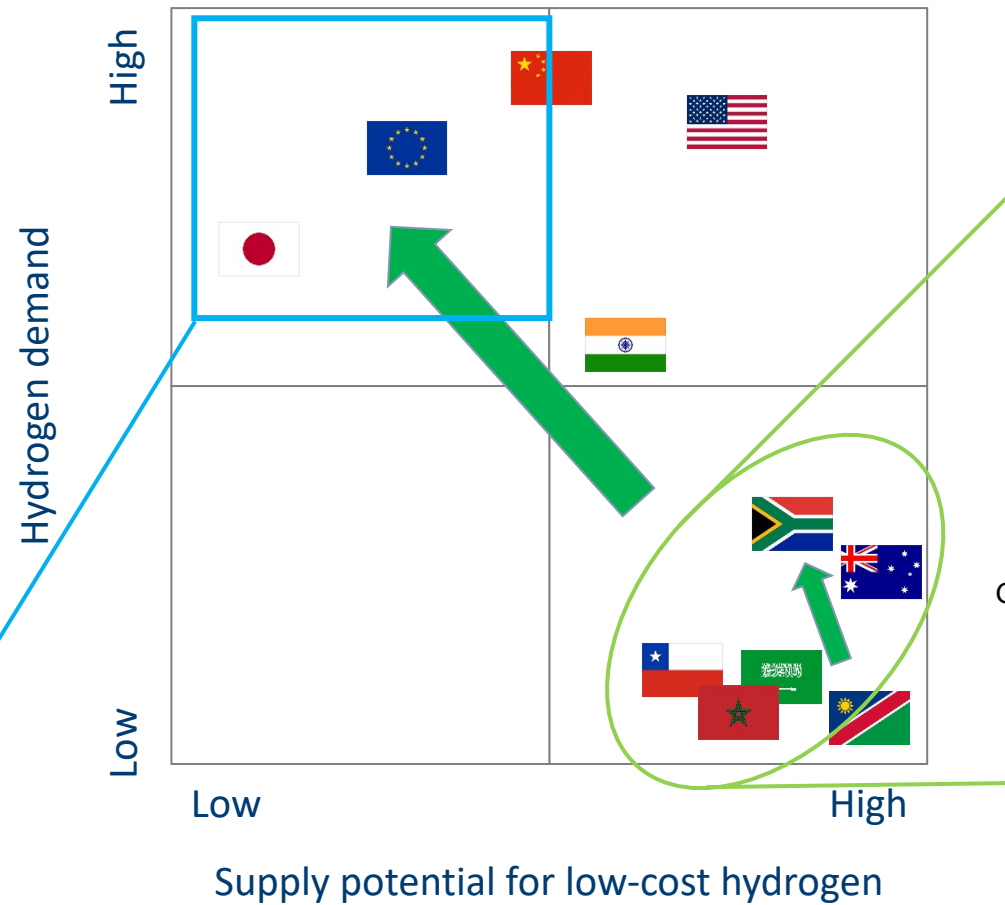


Import hubs

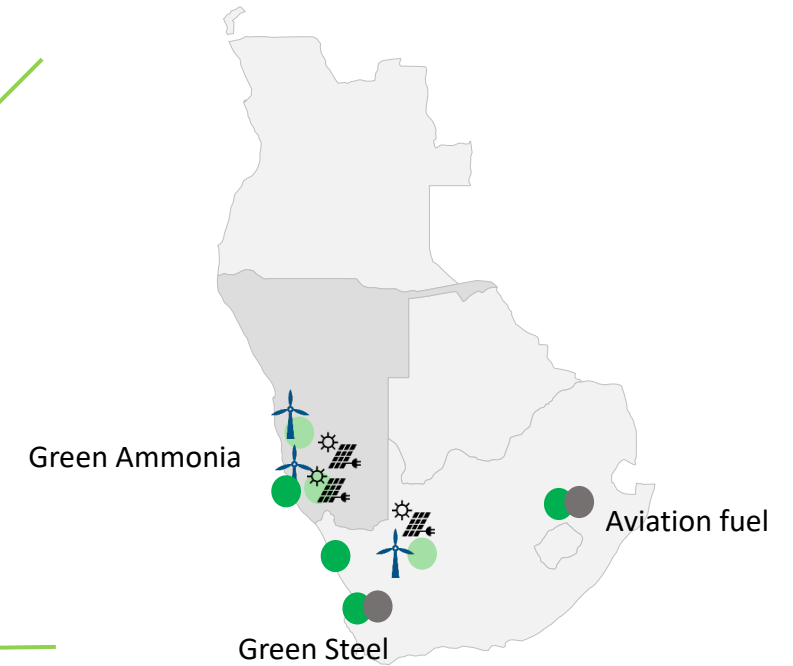


- Import hub
- Major off-taker
- Major production area

Illustrative figure



Export hubs



- Export hub
- Major off-taker
- Major production area


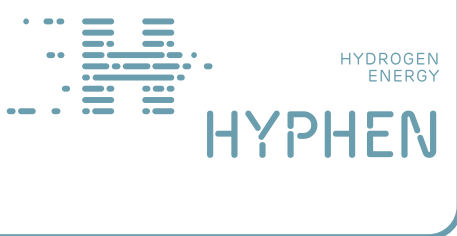
Hydrogen Opportunity

Hyphen Project Summary

Impact for Namibia



INH NICHOLAS HOLDINGS LIMITED



Hyphen business



Purpose
To impact lives & global decarbonisation efforts through green energy development in Namibia




Vision
To be Namibia's leading green hydrogen project developer and supplier, to international, regional and local markets




Values

- Lead by example
- Act with care & integrity
- Socially responsible upliftment, development and empowerment
- Manage resources sustainably & efficiently

Hyphen SCDI project



Republic of Namibia



Through close collaboration with all stakeholders, develop the least environmentally impactful and inclusive green hydrogen project, simultaneously employing and uplifting the lives of Namibia's people.

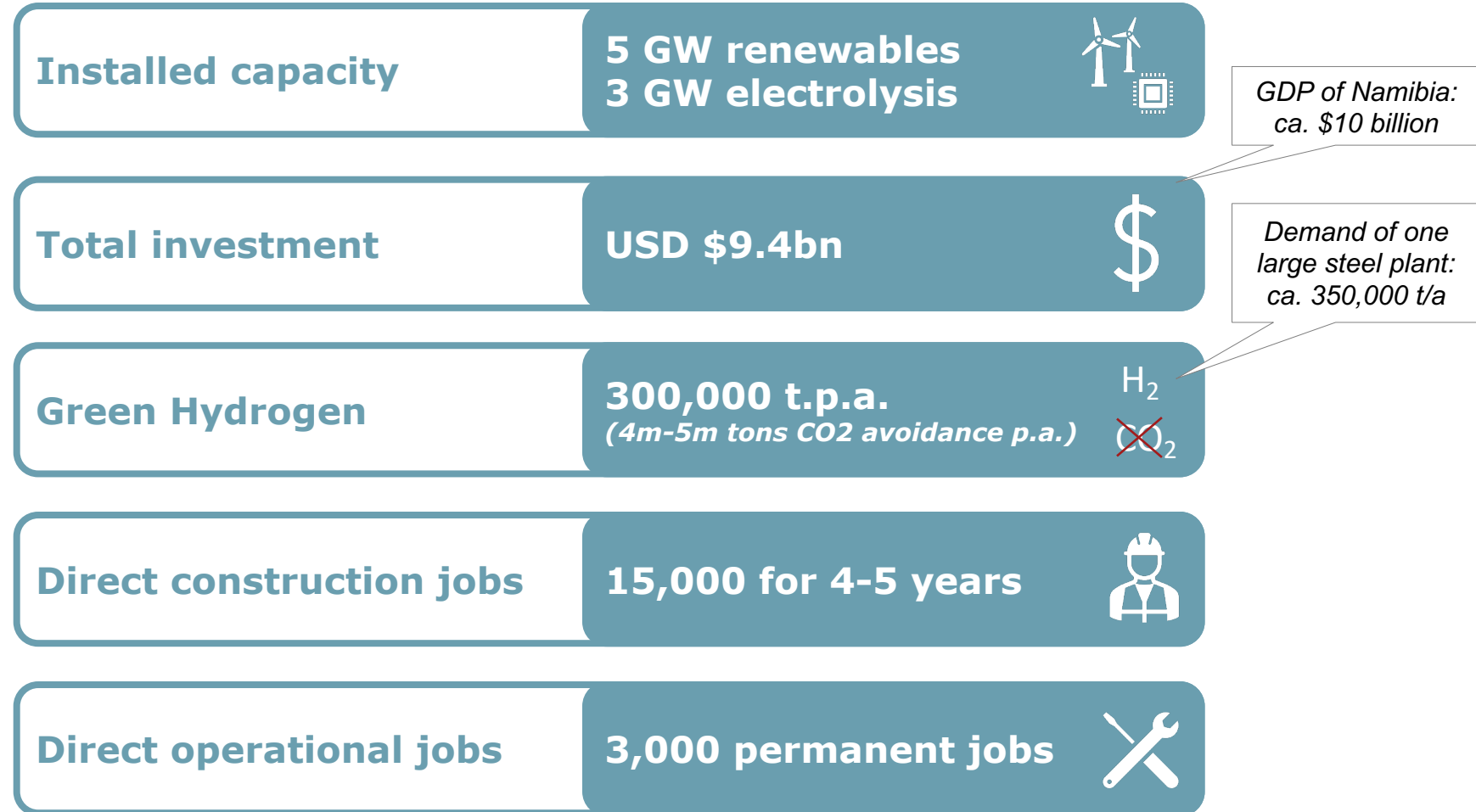
Phase one – *develop hybrid generation facilities, transmission infrastructure and new port facility to establish Namibia as a leading green hydrogen production zone*

Phase two – *scale up hydrogen production capacity and construct pipeline infrastructure to significantly increase Namibia's global competitiveness and establish a regional hydrogen backbone*



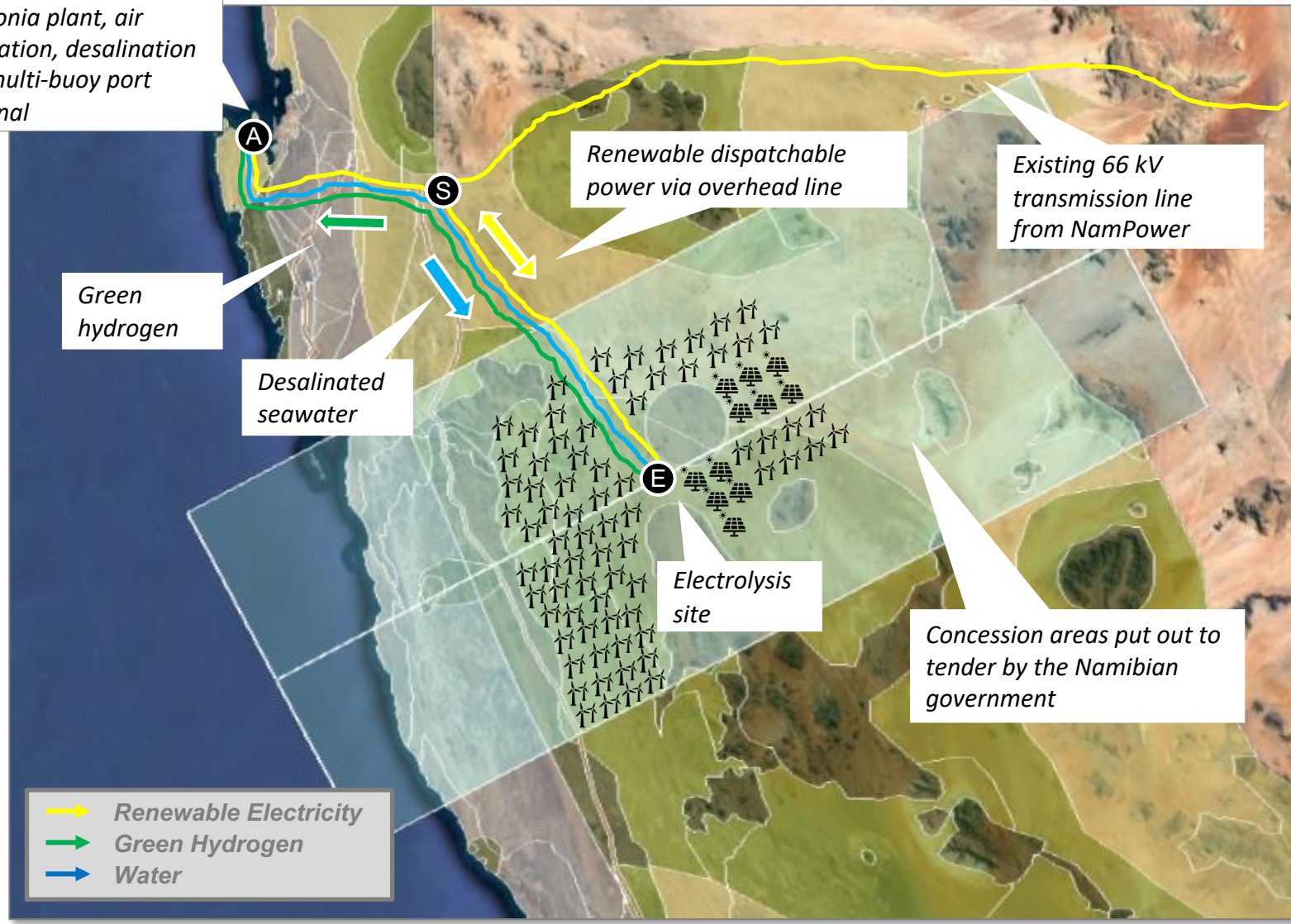
Hyphen - key project facts and figures

Phase one & two

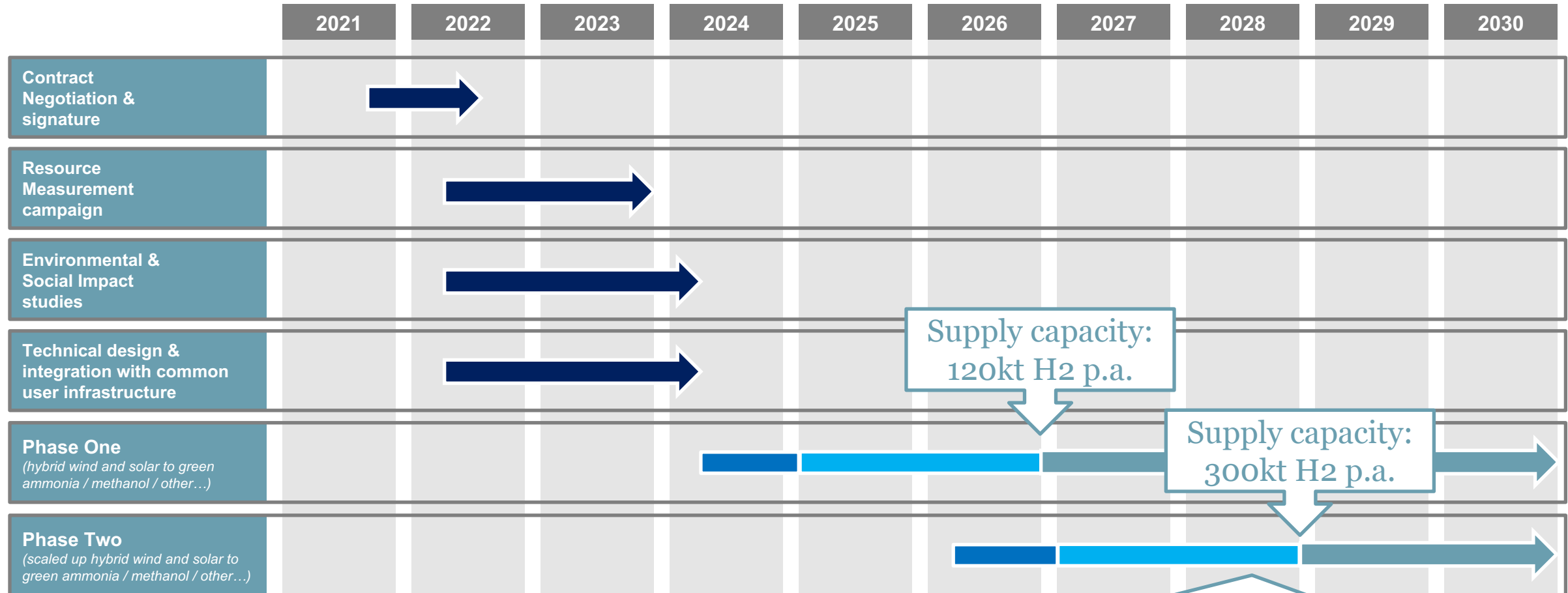


Hyphen project area and connection to Lüderitz port

Lüderitz port area:
ammonia plant, air
separation, desalination
and multi-buoy port
terminal



Hyphen Project: Proposed Timeline



Supply capacity:
120kt H2 p.a.

Supply capacity:
300kt H2 p.a.

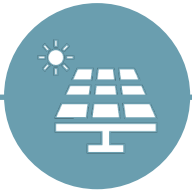
Development Activity
 Construction
 Mobilisation
 Operations

Construction phases are staggered sequentially to ensure construction teams are utilised fully over the build phases without drops in workload. Thus, enabling maximum localisation opportunities and the de-risking of newly formed local construction companies

Hydrogen Opportunity

Hyphen Project Summary

Impact for Namibia



Energy

- Project will establish high voltage transmission lines (66kv / 132kv), substations and hydrogen pipeline infrastructure
- Electricity generation that is excess to the project requirements can be supplied either into the Southern Africa Power Pool or to NamPower, on terms to be agreed



Water

- Project will establish sea water desalination for water supply to the project
- Hyphen intends to over size the desalination plant to provide water supply capacity to Lüderitz
- Lüderitz demand to be established (current demand is 3,000m³ per day)



Roads

- Project will establish and maintain roads within the TKNP and Angra Point in order to access its facilities
- These roads will increase access to both these areas for tourism activities and will assist in driving tourism growth through increased access



Port

- Hyphen proposes the development of a new port
- The port has been designed and phased to enable the start of ammonia exports as a "Phase 0" of the port master plan
- The solution ensures maximum flexibility to maximise the port's development potential



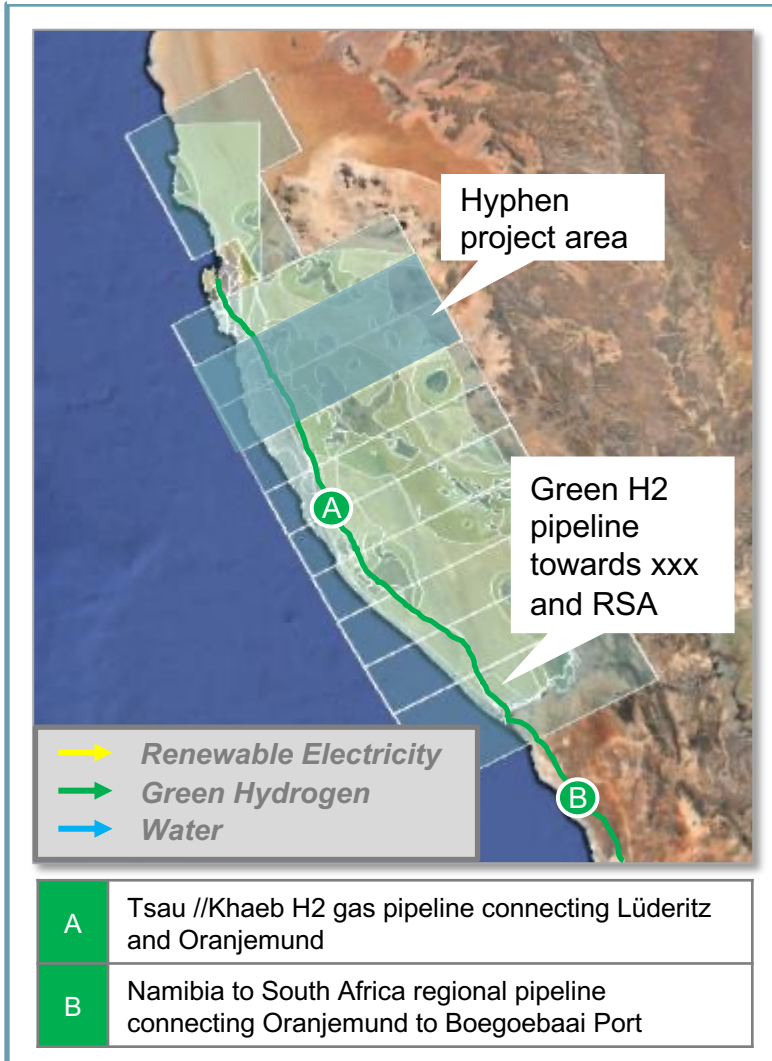
Rail

- Traxtion, a Nicholas Holdings group company, leases locomotives to TransNamib
- Hyphen's value proposition includes the movement of hydrogen project cargo, hydrogen and dry bulk commodities by rail
- Various commercial models available to fund the upgrade of rail track required for these cargos

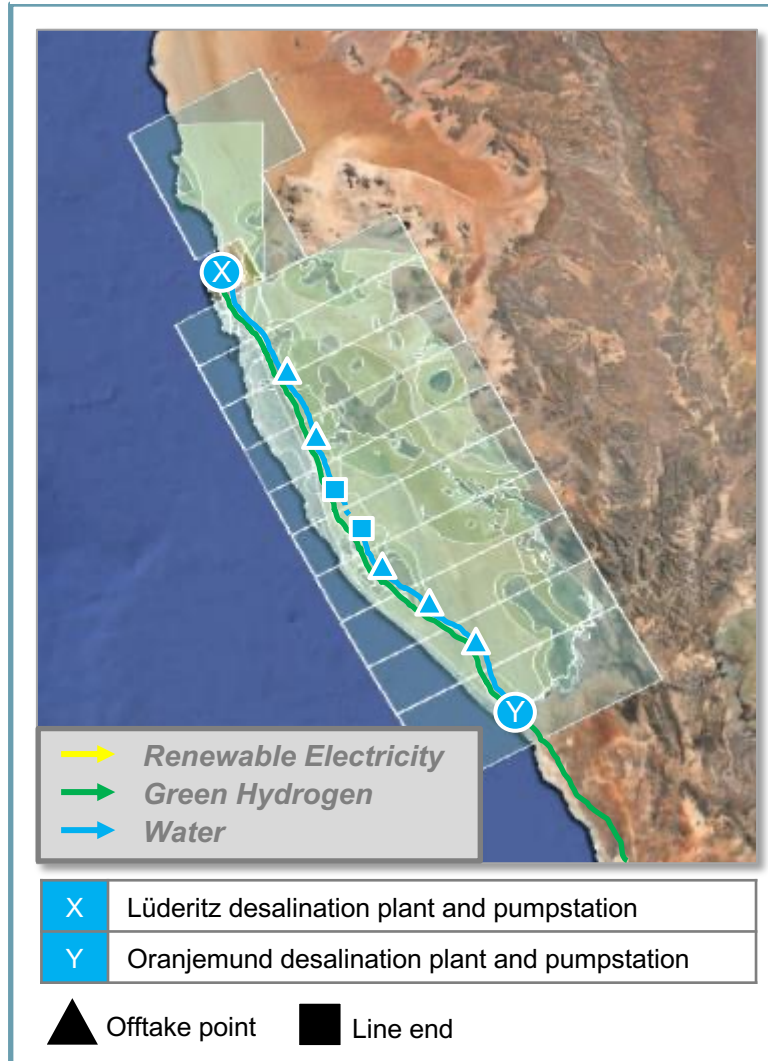


Production potential beyond Hyphen project: 3 Mt/a green H₂

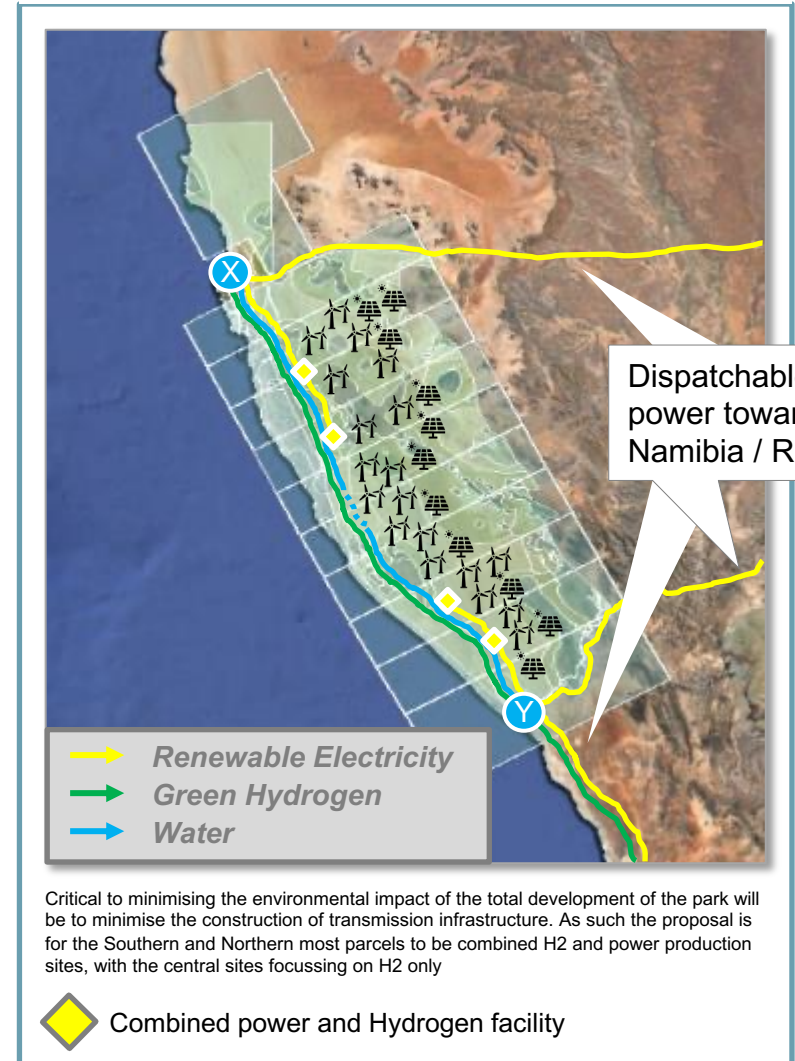
Hydrogen Pipeline Backbone



Desalination & Water Pipeline Infrastructure



Fully developed Renewable Energy Capacity



Competitive advantage: Namibia has a unique combination of solar, wind and land (top 5 worldwide)

What oil and gas meant to commerce and related economic growth for fossil producers in the 20th century, green hydrogen means to Namibia in the 21st century

Namibia can achieve a triad of economy, ecology and social coherence

- Exporting green hydrogen can transform the country into an industrial nation, with value creation along the entire value chain
- This not only reduces Namibia's own CO₂ emissions, but also those in the rest of the world
- This new industry should create equitable, sustainable and socially balanced growth, quality and well-paid jobs, and a welfare state for current and future generations

In addition to the developmental dimension for Namibia itself, a successful renewable and hydrogen economy in Namibia can have an impact in the region and contribute to the faster decarbonization of Southern Africa



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