
DAURES
GREEN
HYDROGEN
VILLAGE
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DAURES GREEN HYDROGEN CONSORTIUM

DAURES GREEN HYDROGEN VILLAGE

DAURES GREEN HYDROGEN VILLAGE LAUNCH

2 DECEMBER 2022

STRATOS BALLROOM | AVANI HOTEL | WINDHOEK

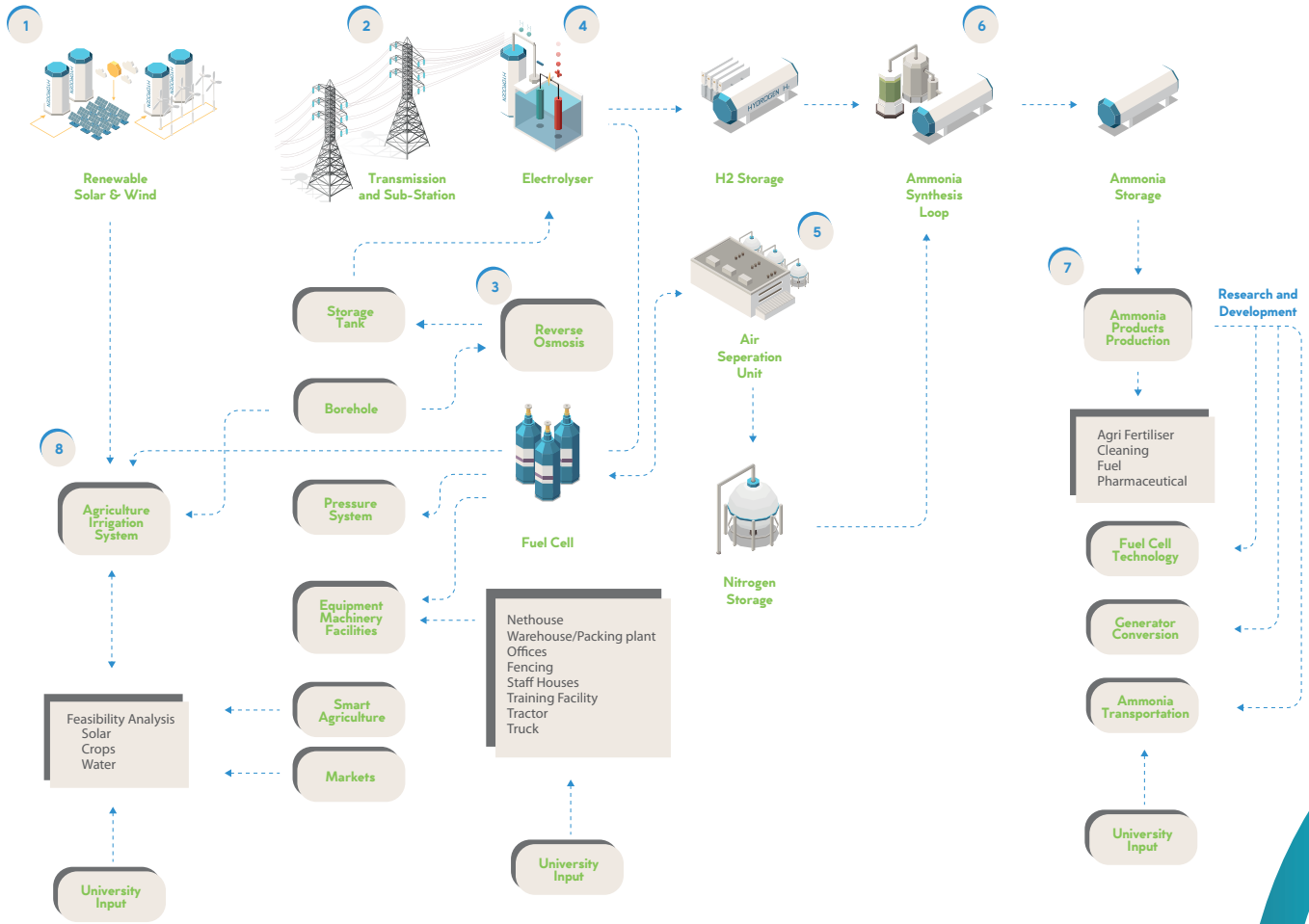
Activity	Name	Time
Arrival of guests		08h30 - 09h00
Welcoming Remarks from MC	Mr. Ricardo Goagoseb	09h00 - 09h10
Project Overview (Project Lead)	Mr. Jerome Namaseb Daures Green Hydrogen Village	09h10 - 09h30
Key Note Address : The Need for An Inclusive Project	Chief Z. Seibeb Daure Daman Traditional Authority	09h30 - 10h00
Performance	Ms. Chloe Brandt	10h00 - 10h30
Breakfast	Buffet	10h00 - 10h30
Presentation of Pre-Feasibility Study	Dr. Markus Groissboeck Fitchner	10h30 - 11h00
Presentation of Wind Study	Mr. Johannes Lange GEO-NET	11h00 - 11h15
Project Configuration : Turbine selection, solar, etc	Ms. Aina Kauluma Daures Green Hydrogen Village and UNAM Student	11h15 - 11h30
Research	UNAM / Universty of Stuttgart	11h30 - 11h45
Short Video	Project Impact Video	11h45 - 11h55
Signing of MoUS	Strategic MOUs	11h55 - 12h20
Official Daures Green Hydrogen Video	Playing of the official Project Video	12h20 - 12h30
Vote of Thanks	Mr. Elton Katangolo Daures Green Hydrogen Village	12h30 - 12h45

PROJECT OVERVIEW

The Daures Constituency is the largest constituency in Namibia with a population of approximately 11,350 people. Over 80% of the residents survive under 1 US$ per day. The Daures Green Hydrogen Village (DGHV) will be Africa's first Net Zero village. In Its first phase, the village will employ over 100 Namibians during construction and over 50 permanent Namibian's in a modern carbon free estate.

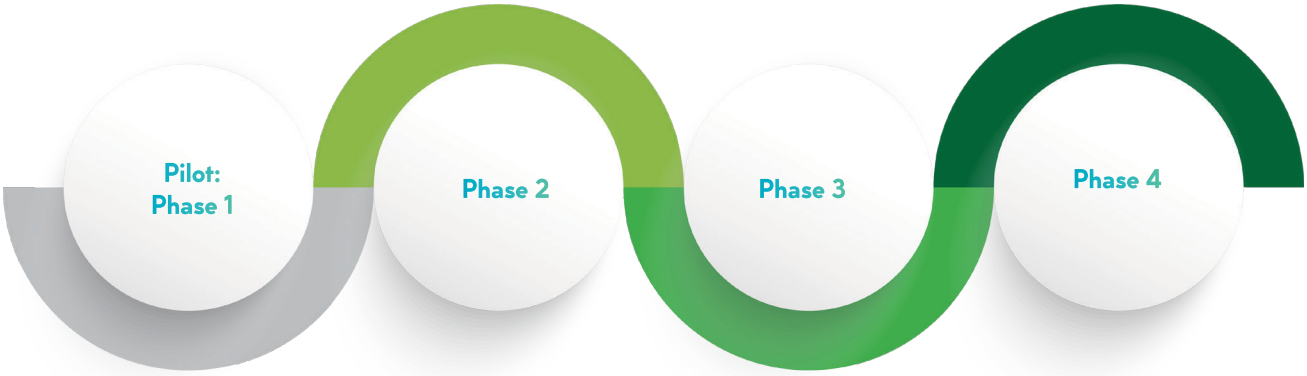
The Daures Green Hydrogen Village intends to achieve the below:

1. Sustainable production of green hydrogen and ammonia from renewable sources
2. Demonstration of green hydrogen applications and enablement of green hydrogen economy with ability to export green hydrogen and ammonia to potential offtakers
3. Sustainable production of Net Zero "green" agricultural produce from green houses that create local employment and partnership
4. Research opportunities for local and international students



PROJECT PHASING

- The water supply for the project in Phase 1 will be sourced from commercial boreholes. A 120 m3 Reverse Osmosis facility will be installed to ensure the water is treated to meet the agriculture and electrolyzer water quality requirements.
- Desalinated water for the subsequent phases will be piped to the project site to meet the hydrogen, ammonia, housing and agricultural water requirements.
- The evacuation of hydrogen for phase 2 to 4 will be through a dedicated hydrogen gas pipeline to the port of Walvis Bay
- At the port, Nitrogen will be captured from the air using an air separation unit and combined with hydrogen through ammonia synthesis, before export
- The project in it's 3rd and 4th phases, aims to trade liquid ammonia within the region through various ports and eventually export clean ammonia to support Europe's decarbonization ambitions
- The project's pre-feasibility study was conducted by Fitchner GmbH and the full feasibility for phases 2 - 4 is scheduled to commence in January 2023



2022/2023	2023/2024	2026/2028	2029/2032
Solar : 0.99 MW *Wind : 0.3 MW Electrolysis : 0.5 MW Hydrogen 31 t/ year Ammonia : 109 t/year	Solar : 4 MW Wind : 6 MW Electrolysis : 4 MW Hydrogen 602 t/year Ammonia : 3500 t/year	Solar : 40 MW Wind : 60 MW Electrolysis : 42 MW Hydrogen 6,052 t/year Ammonia : 35,000 t/year	Solar : 400 MW Wind : 600 MW Electrolysis : 420 MW Hydrogen 60,544 t/year Ammonia : 352 000 t/year

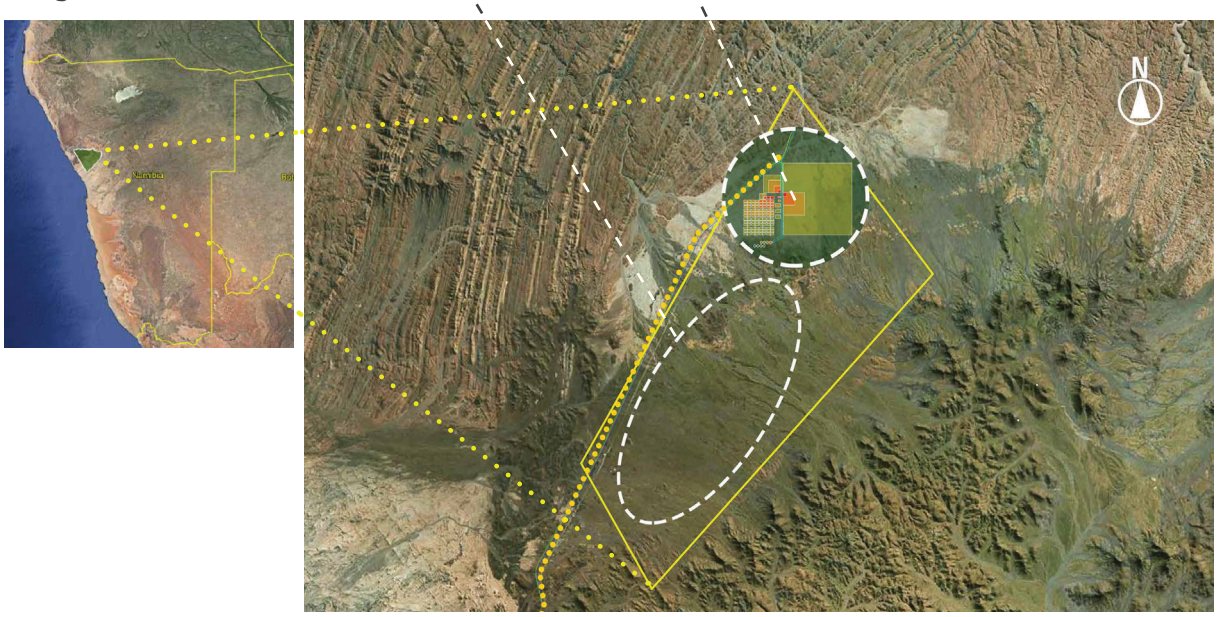
Above: Dâures Green Hydrogen Village in phase 4

SITE LOCATION & LAYOUT

Site is 15,000 hectares with potential to generate in excess of 1.0GW of renewable energy power

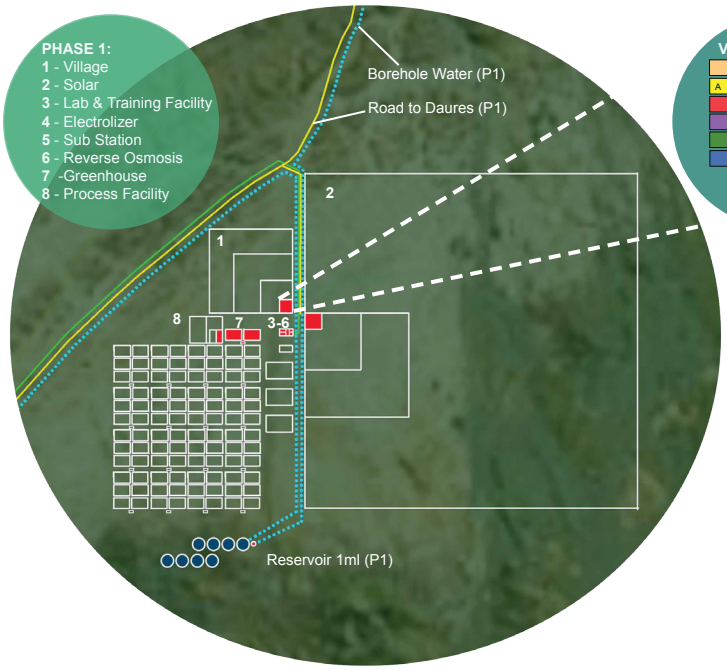
Solar, industrial, agricultural and training site

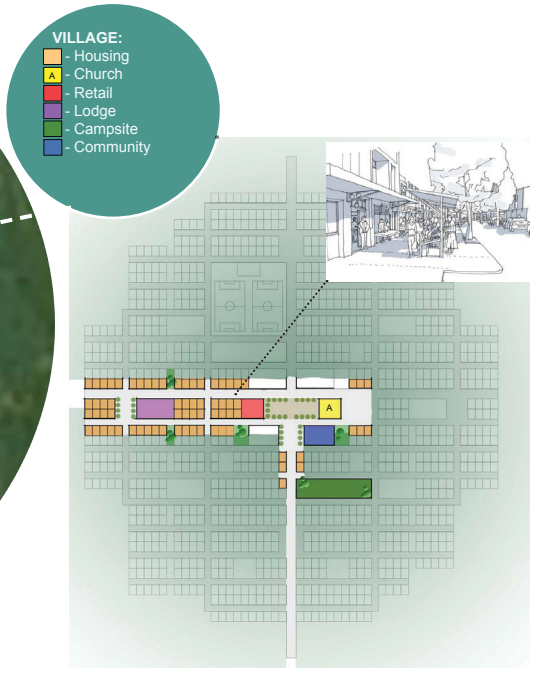
Wind generation area



PHASE 1 SHORT TERM VIABILITY & USE CASES

Solar: 0.99 MW | **Wind**: 0.3 MW | **Electrolysis**: 0.5 MW | **Hydrogen**: 31 t/year | **Ammonia**: 109 t/year





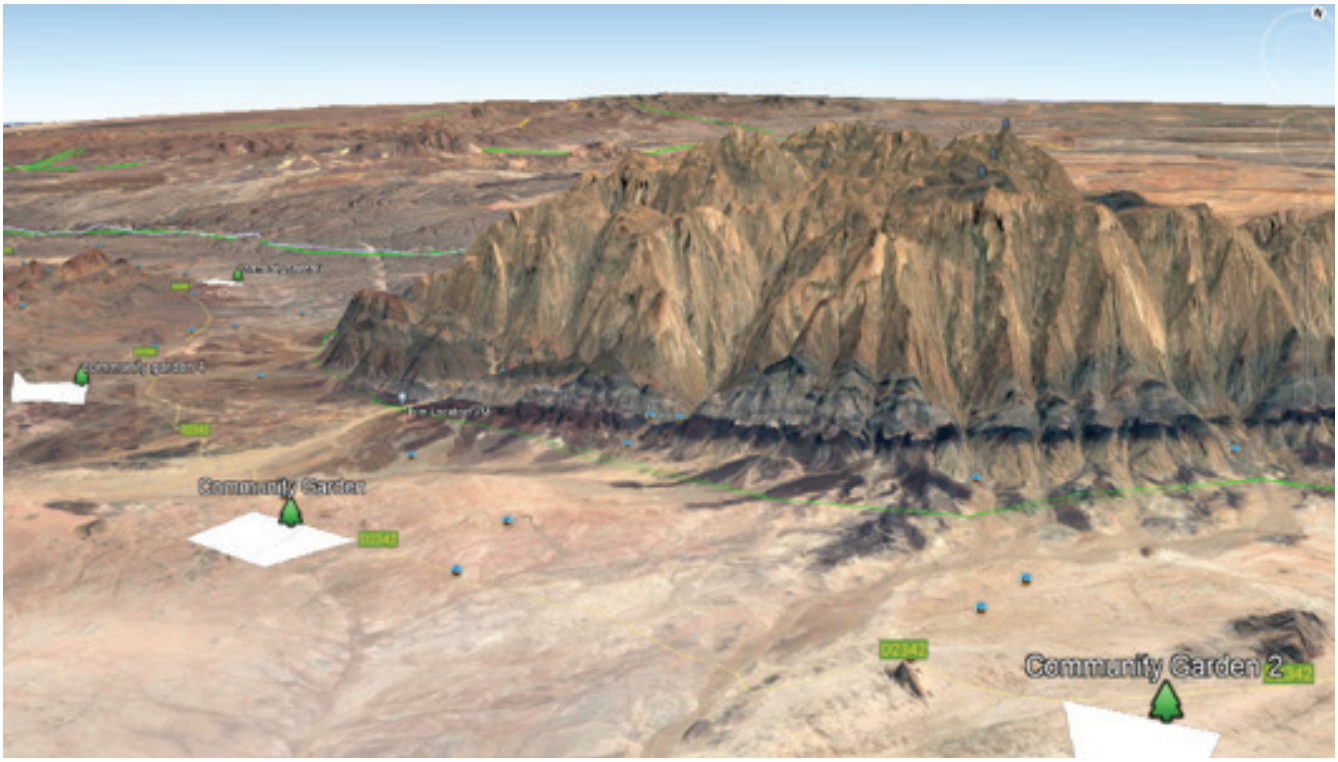
SMART AGRICULTURE

- Climate-controlled greenhouse powered by fuel cells using locally produced hydrogen and ammonia
- Green houses : 20 000 m2 (2 ha) and Chilled rooms for storage
- Anchor Crop : Tomatoes (Fixed Vent)
- Carrots (Net Houses)
- Production of Africa's first carbon free "green" Tomatoes and Carrots
- Estimated annual production of 500t of tomatoes per year and 600t Carrots per year
- With employment opportunities for 30 – 50 Locals

Above: Phase 1 green houses

COMMUNITY INVOLVEMENT

- Local Community participation and shareholding in the project through the Daure Daman Traditional Authority and Tsiseb Conservancy
- Establishing of 12 community gardens, consisting of solar and fuel cell powered boreholes, 2000 m2 drip irrigation and seed crop supply
- Communities will be trained on crop production
- DGHV to enter into agreements with the successful communities to collect, purchase and on-sell the crops on an agreed frequency
- Program intends to bring markets, sustainable jobs and food security to over 1000 people in the conservancy

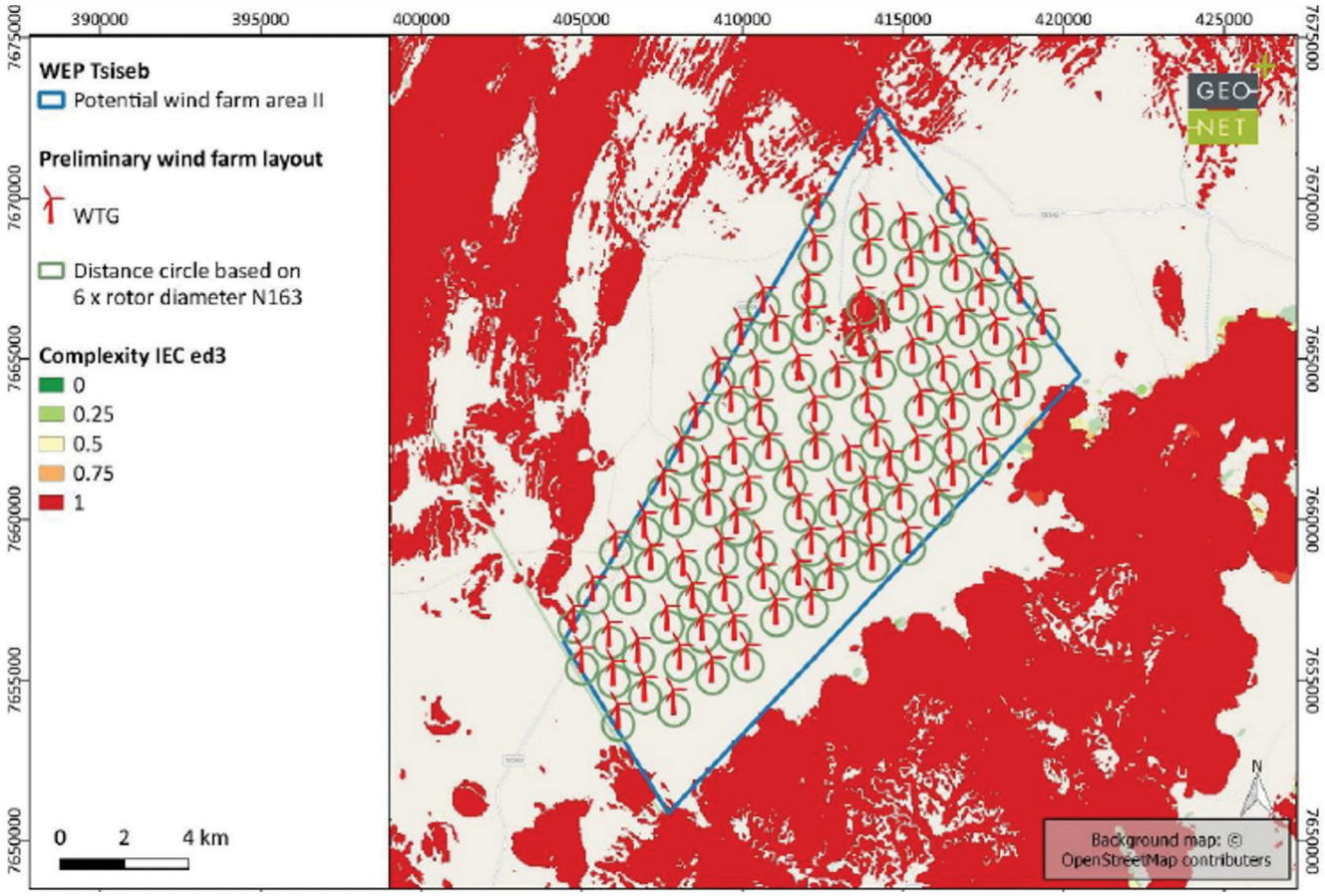


Above: Indicative community garden program

Above: Dâures Green Hydrogen Village in Phase 4

WIND

- Optimized micro sitting of wind turbines (100 turbines, 5.9 MW turbines, 590MW) at a minimum distance of 6x rotor diameter.
- Optimization to 4x rotor diameter possible thus increasing wind energy profile to 150 turbines with energy potential of 885MW
- Exceptional Wind resources at a hub height of 120m
- Preliminary gross wind capacity factors between 50% to 57%

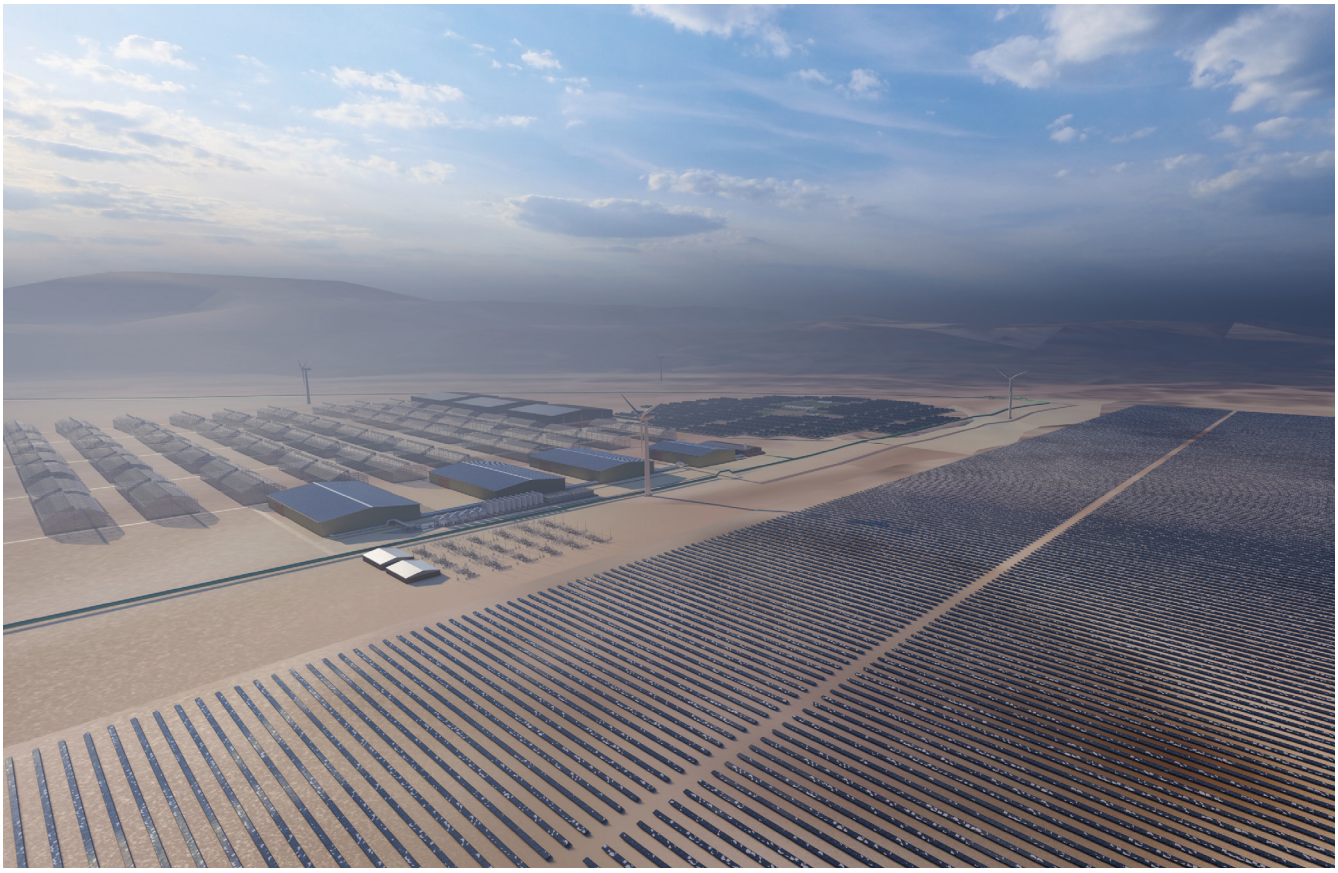


Above: Preliminary Phase 4 micro sitting

SOLAR

- 28 year time series used in solar analysis
- Analysis shows a GHI of 2443 and a DNI of 2873
- Solar site potential amounts to 420MW with further opportunities to optimize
- Solar studies conducted by Solargis

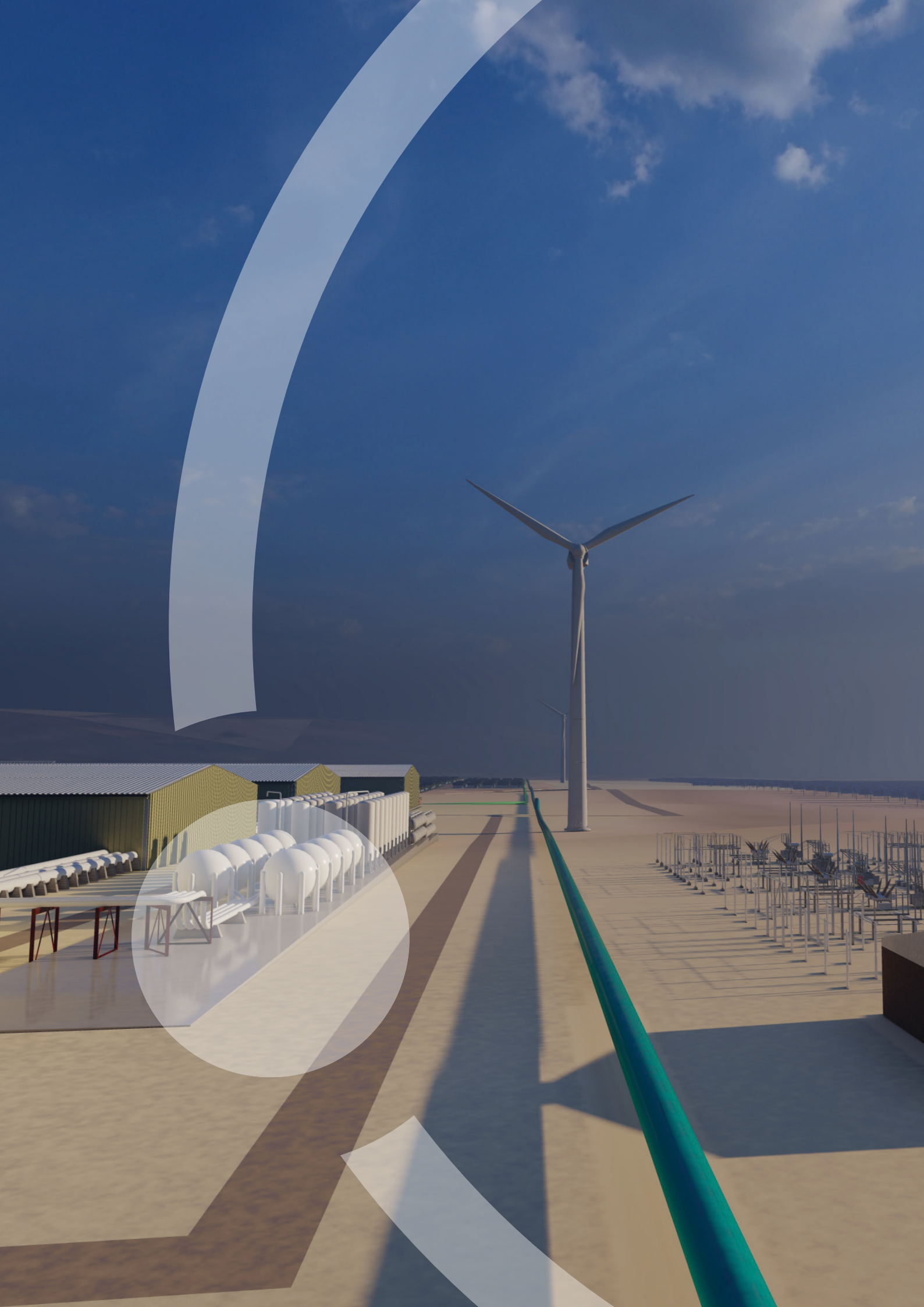
	TS	TMY P50	TMY P90	
Global Horizontal Irradiation	**2443**	2443	2325	kWh/m²
Direct Normal Irradiation	**2873**	2873	2533	kWh/m²
Diffuse Horizontal Irradiation	**547**	549	629	kWh/m²
Air Temperature at 2 m	**21.1**	21.2	21.2	°C



Above: Dâures Green Hydrogen Village in Phase 4

Above: Site photo, Dâures Green Hydrogen Village

Above: Proposed wind turbine area



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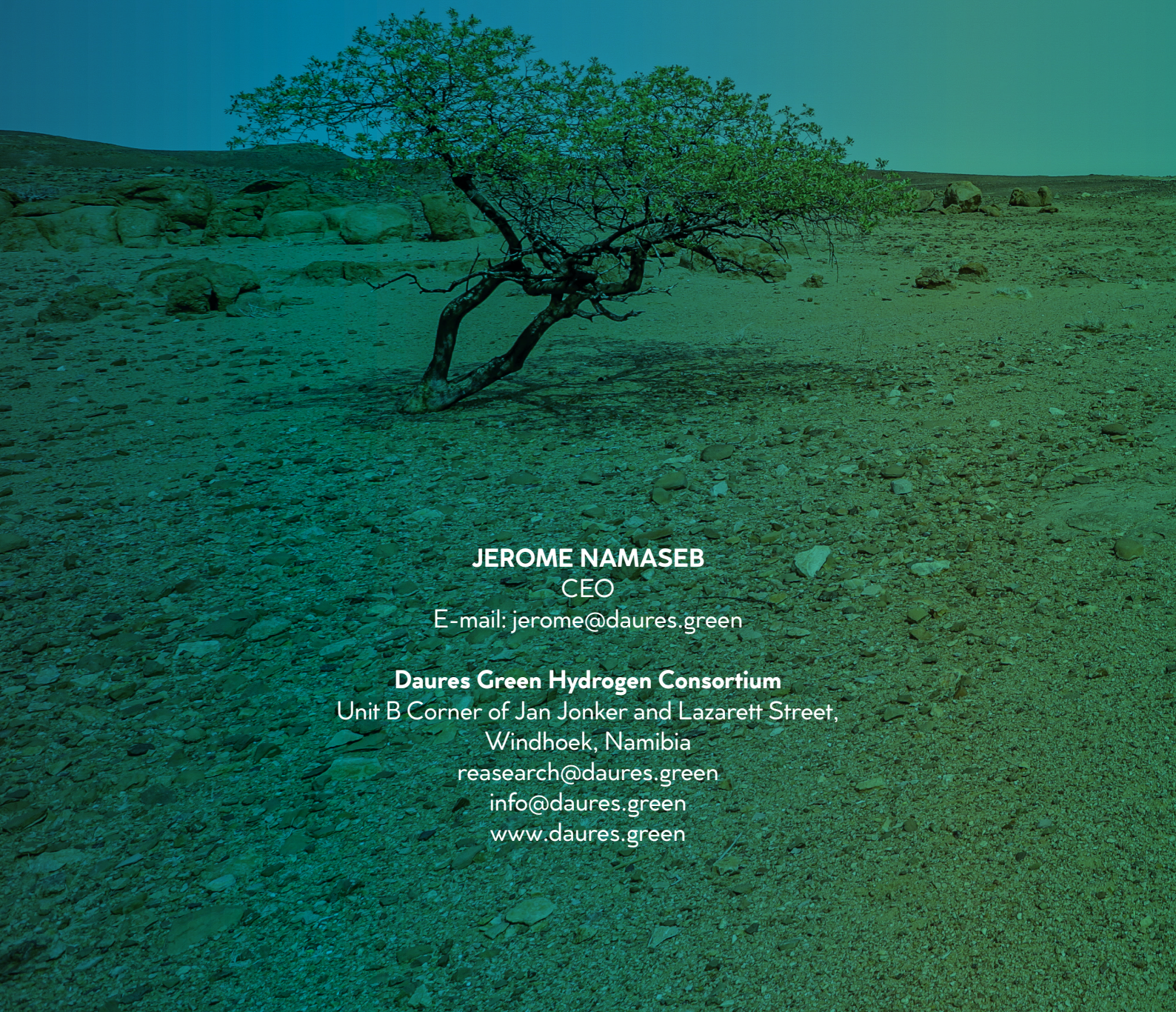

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