



# PID - SUMMARY

ENERFUSION PARK IS A FLAGSHIP RENEWABLE ENERGY AND GREEN FUELS HUB INTEGRATING WIND, SOLAR, BATTERY STORAGE, AND HYDROGEN/AMMONIA PRODUCTION TO DRIVE SUSTAINABLE INDUSTRIAL DEVELOPMENT AND GRID RESILIENCE IN SOUTH AFRICA.



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# SIP 20E



## THE MARYDALE ENERFUSION PARK

IS A GREEN HYDROGEN, AMMONIA AND DERIVATIVES PROJECT SUPPORTED BY



THE PRESIDENCY  
REPUBLIC OF SOUTH AFRICA

**INFRASTRUCTURE**  
South Africa

**nceda**  
Northern Cape Economic Development  
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Province of the  
**Northern Cape**  
REPUBLIC OF SOUTH AFRICA



**SIYATHEMBA  
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**science  
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Department:  
Science and Technology  
REPUBLIC OF SOUTH AFRICA



SIP20e

# MARYDALE ENERFUSION PARK

**Location:** Marydale, Northern Cape, South Africa

**Sector:** Renewable Energy | Green Hydrogen | Green Ammonia | Fertilizer Manufacturing

**Project Status:** Prefeasibility Complete | Permitting Initiated

**Strategic Designation:** Strategic Integrated Project (SIP) under SIP20e (National Green Hydrogen Programme)







# PROJECT SUMMARY

[See Summary.](https://pine-659.faces.site/4j8fmdmf2ont)

<https://pine-659.faces.site/4j8fmdmf2ont>

The Marydale Enerfusion Park is an integrated renewable energy and green industrial complex in South Africa's Northern Cape, representing a R63 billion investment.

**Energy Infrastructure:** The project is designed for operational independence, featuring 1,110 MW of solar PV and 150 MW of wind generation. This is supported by a 450 MW / 1,500 MWh battery energy storage system, allowing the facility to operate independently of the national grid, which serves only as a backup.

**Production Capacity:** The core output is green ammonia and its derivatives. The facility will house 918 MW of electrolyzer capacity spread across three phases. At full capacity, this will enable the production of 900,000 to 930,000 tonnes of green ammonia annually. This ammonia is immediately converted on-site into 1.5 to 1.75 million tonnes of fertilizer and industrial products. A key by-product is at least 150,000 tonnes of liquid oxygen per year.

**Phased Development:** The project will be **executed in three phases**. Phase 1 will establish 306 MW of electrolysis and 520 MW of renewable generation. Phases 2 and 3 will each add a further 306 MW of electrolysis and 370 MW of solar, culminating in the total capacities mentioned above.

**Operational Model:** The design emphasizes integration and circularity. Renewable energy powers electrolysis for hydrogen, which is immediately converted to ammonia to limit complex handling and transport costs. Excess energy is stored in the battery system, and by-products like oxygen and water treatment sediments are captured for commercial or agricultural use, creating a highly efficient and cost-competitive operation.





## PROJECT LOCATION & SITE ADVANTAGES

The project is located near Marydale in the Northern Cape, within a designated Renewable Energy Development Zone (REDZ). Key site features include:

| Feature                                                 | Advantage                         |
|---------------------------------------------------------|-----------------------------------|
| <b>Total project site</b>                               | >1,600 hectares secured           |
| <b>Onsite wind &amp; solar resource</b>                 | High-yield generation potential   |
| <b>Onsite access to national grid</b>                   | Backup / supplementary power only |
| <b>Onsite existing boreholes</b>                        | 5+ boreholes available            |
| <b>Within 1 km of existing loading bay</b>              | Logistics efficiency              |
| <b>Within 14 km of main water source (Orange River)</b> | Responsible water extraction      |
| <b>Proximity to highways</b>                            | Transport connectivity            |



# TECHNICAL OVERVIEW

## RENEWABLE ENERGY INFRASTRUCTURE (ONSITE)

The park is designed for near-total grid independence. The national grid serves only as a limited backup.

| Component                                     | Capacity           |
|-----------------------------------------------|--------------------|
| Solar PV (Onsite)                             | 1,110 MW           |
| Wind generation (Onsite)                      | 150 MW             |
| Battery Energy Storage System (BESS) (Onsite) | 450 MW / 1,500 MWh |
| Additional Power (Grid / IPP Power)           | +400MW             |

This hybrid system ensures continuous power for electrolysis and ammonia production, with excess energy stored in batteries.

## GREEN HYDROGEN & AMMONIA PRODUCTION

| Parameter                                               | Full Capacity                  |
|---------------------------------------------------------|--------------------------------|
| Electrolyzer capacity                                   | 918 MW (across 3 phases)       |
| Green ammonia production                                | 900,000 – 930,000 tonnes/year  |
| Ammonia derivatives (fertilizers, industrial chemicals) | 1.5 – 1.75 million tonnes/year |
| Liquid oxygen (by-product)                              | ≥150,000 tonnes/year           |



# SIP20E DESIGNATION: A CATALYST FOR ACCELERATED DEVELOPMENT

The Marydale Enerfusion Park's classification as a Strategic Integrated Project (SIP) under SIP20e (National Green Hydrogen Programme) unlocks critical advantages that fast-track development and enhance bankability.

**Streamlined Regulatory Approvals:** The Projects location within a Renewable Energy Development Zone (REDZ), combined with SIP status, triggers streamlined environmental authorizations and approvals process, significantly reducing permitting timelines as well as removing a common source of multi-year delays.

**Prioritized Grid Integration:** The project's need for additional power from the local IPPs and / or National Utility creates grid benefits such as prioritized assessments and expedited approvals from Eskom as well as NERSA, securing contingency infrastructure without protracted waiting periods.

**Enhanced Access to Blended Finance:** Strategic national importance enables participation from development finance institutions in blended funding structures, reducing perceived investment risk and attracting private capital on favorable terms across all three construction phases. **The IDC (Industrial Development Corporation) provides significant evaluation, inputs and recommendations to the ISA committee that issues SIP designation to viable projects.**

**Cross-Governmental Coordination:** SIP status mandates coordinated engagement across national, provincial, and local government levels, preventing fragmented decision-making and creating a single window for approvals that maintains development momentum.

**Policy Alignment and Endorsement:** As a flagship initiative advancing South Africa's Just Energy Transition, SIP20e designated projects carry implicit political backing - facilitating high-level stakeholder engagement and building investor confidence throughout implementation.



Project Approved as Part of the  
National Green Hydrogen  
Programme



## PHASED DEVELOPMENT APPROACH

The project is executed in three sequential phases to manage risk and optimize capital deployment.

| Phase   | Solar PV (new) | Wind   | Electrolyzer (new) | Cumulative Ammonia Output |
|---------|----------------|--------|--------------------|---------------------------|
| Phase 1 | 370 MW         | 150 MW | 306 MW             | ~330,000 tonnes/year      |
| Phase 2 | +370 MW        | –      | +306 MW            | ~660,000 tonnes/year      |
| Phase 3 | +370 MW        | –      | +306 MW            | ~930,000 tonnes/year      |
| Total   | 1,110 MW       | 150 MW | 918 MW             | Up to 930,000 t/year      |

Each phase includes proportional battery storage expansion.

## MARKET & OFFTAKE OPPORTUNITIES

### 6.1 Primary Market: Southern African Region (Agriculture)

- Green ammonia-based fertilizers and micronutrient solutions.
- Estimated cost reduction for farmers: 30–40% compared to imported fertilizers.
- Improved supply reliability and localized distribution.

### 6.2 Secondary Market: Mining Sector

- Ammonium nitrate for explosives manufacturing.
- Domestic supply chain resilience for mining operations.

### 6.3 Industrial Gases

- 150,000+ tonnes/year of liquid oxygen for medical, industrial, and manufacturing sectors.

### 6.4 International Exports

- Focus on Japan, Australia, India, and the European Union.
- 300,000+ tonnes/year of green ammonia for export markets.



## GRID CAPACITY & IPP PARTNERSHIP OPPORTUNITY

Although the park operates largely independently, it will require 400–600 MW of supplementary power from the national grid. To secure this capacity, the project is engaging:

- NERSA (National Energy Regulator)
- The IPP Office
- Eskom
- DMRE (Department of Mineral Resources and Energy)

This creates a significant opportunity for Independent Power Producers (IPPs) to connect to the grid via Power Purchase Agreements (PPAs), supporting the park's load requirements while accelerating South Africa's renewable energy rollout.

## INDUSTRIAL & LOCALISATION PARTNERSHIPS

The Marydale Enerfusion Park is a strategically resilient green ammonia and fertilizer hub in South Africa's Northern Cape, designed to operate independently of the national grid using 1,260 MW of onsite wind and solar power.

Ongoing geopolitical tensions, including the USA–Iran conflict, risk disrupting global fertilizer supply chains and damaging critical production infrastructure in the Middle East—leading to higher import prices and shortages. This creates a clear opportunity for the Enerfusion Park to position itself as a stable, cost-competitive alternative.

The project presents strategic opportunities for:

- **Global chemical & logistics leaders** (e.g., YARA, Nutrien, Sasol) to provide expertise in production, distribution, and storage.
- **Local SMEs** to participate in maintenance, transport, and derivative product supply chains.
- **Domestic value chain development** ensuring sustainable distribution across the region.



# ENVIRONMENTAL SUSTAINABILITY

## Carbon Emissions Reduction

The Marydale Enerfusion Park will deliver a substantial contribution to South Africa's climate goals. By replacing fossil-fuel-based industrial processes with renewable-powered green ammonia production, the project will achieve a direct annual reduction of **2.1 million tonnes of CO<sub>2</sub> equivalent, the same as removing approximately 450,000 passenger vehicles from South African roads every year.**

This reduction represents roughly 0.5% of South Africa's total annual emissions and aligns with 15% of the country's 2030 Nationally Determined Contribution (NDC) targets under the Paris Agreement. Beyond direct emissions, the project will avoid indirect emissions from imported fertilizers, demonstrating how industrial decarbonization can be achieved without compromising competitiveness.

## Resource Management

Water will be sourced responsibly from the Orange River, located within 14 km of the site, operating within licensed extraction limits and without impacting local community or agricultural water security. A closed-loop treatment system is designed to achieve over 90% water reuse, dramatically reducing freshwater demand.

Sediments captured during water treatment will be repurposed as feedstock for fertilizer production, turning a potential waste stream into a valuable input. This circular approach will also integrate agricultural waste from local farmers, further reducing reliance on virgin raw materials.

## Land Use & Biodiversity

The Enerfusion Park Project is located within a designated Renewable Energy Development Zone (REDZ), areas specifically identified by **the South African government as suitable for large-scale energy infrastructure with minimized environmental conflict.** The Environmental Impact Assessment (EIA) is currently ongoing and remains a priority, with submissions planned across multiple permit categories. A detailed biodiversity management plan will be developed and implemented, including measures to protect local fauna, manage vegetation, and prevent soil erosion in this semi-arid region.



# SOCIAL & ECONOMIC IMPACT

## Employment (Direct & Indirect)

| Category                 | Estimated Positions |
|--------------------------|---------------------|
| Construction (temporary) | 3,500               |
| Permanent operations     | 2,200               |
| Indirect supply chain    | 4,100               |
| Community programs       | 2,100+              |
| Total                    | ~15,000+            |

## Community Development Focus

The project specifically targets the communities of:

- Marydale
- Prieska
- Niekershoop
- Vanwyksvlei

## Development Programs

- Farmer integration and capacity building.
- Technical skills development for operations and maintenance.
- Small business incubation for local enterprises.
- Community trust with project equity participation.

# REGULATORY & PERMITTING PROGRESS (SIP20e ADVANTAGE)

As a SIP20e-designated project, the Enerfusion Park benefits from:

| Benefit                                | Impact                                                |
|----------------------------------------|-------------------------------------------------------|
| <b>Streamlined EIA</b>                 | Reduced permitting timelines by 30–40%                |
| <b>Prioritized grid integration</b>    | Expedited Eskom & NERSA approvals                     |
| <b>Cross-governmental coordination</b> | Single window for approvals                           |
| <b>Policy alignment</b>                | Implicit political backing for Just Energy Transition |

## IMPLEMENTATION TIMELINE

| Period    | Activity                                                                                                        |
|-----------|-----------------------------------------------------------------------------------------------------------------|
| 2025-2027 | Development finance mobilization, FEED studies initiation, EIA & water license submissions begin                |
| 2025-2027 | FEED completion, resource validation, EIA applications submitted across 8 categories, grid agreements finalized |
| 2025-2027 | Legal documentation, due diligence, audited model, financial close                                              |
| 2028-2030 | Phase 1 construction & commissioning                                                                            |
| 2028-2030 | Phase 2 & 3 construction, scaling to full capacity                                                              |
| 2030-2086 | Full operational capacity and performance optimization                                                          |

SIP20e designation reduces typical development timelines by 6–9 months compared to conventional projects.



# UNIQUE PROJECT FEATURES



**Onsite Power Generation (Wind & Solar)**

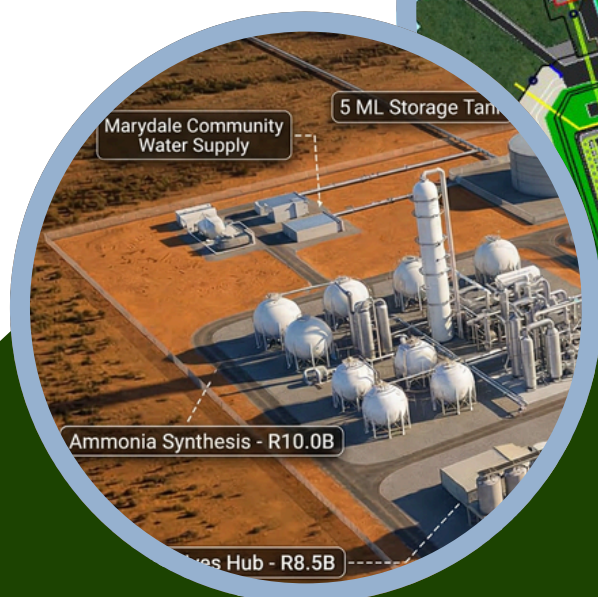
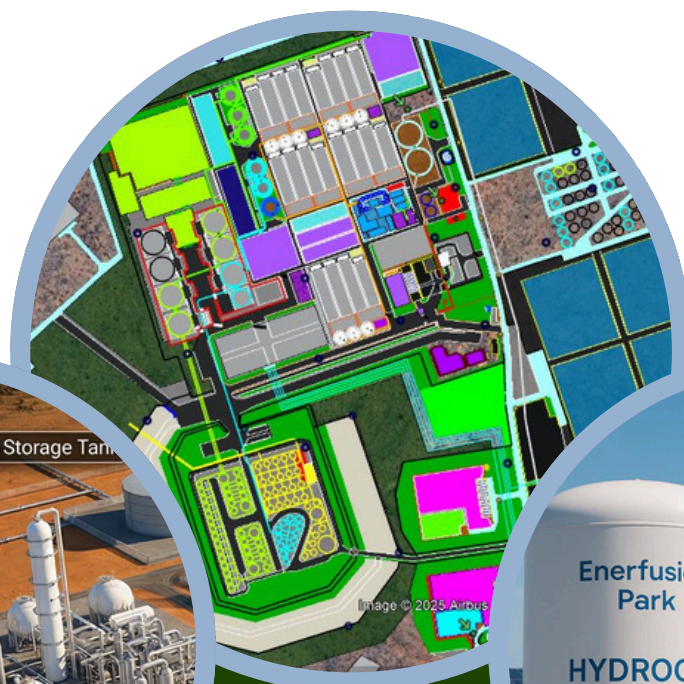
**Onsite Access to Highways**

**Onsite Access to National Grid**

**Onsite Existing Boreholes (+5)**

**Within 1km of existing loading bay**

**Within 14km of main Water Source**



## Low Development Cost

Located within REDZ  
+ SIP20E Designation

**+1600Ha Project Site  
Secured**

## Onsite Advantage

Chemical Producing  
Derivatives Manufacturing  
Onsite Waste to Profit System



Innovation that Grows...



# For more information about us and our projects

## CONTACT

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