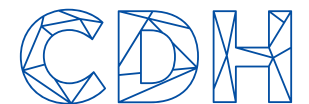




Navigating the developing Southern African Green Hydrogen policy and regulatory framework



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Jackwell Feris

Sector Head:
Industrials, Manufacturing & Trade

Foreword

In 2022, amidst of the global rush for a solution to meet decarbonisation goals set for 2030 and 2050, CDH released the first edition of our [Hydrogen Insights Publication](#). In that publication we agreed that clean hydrogen as the missing piece of the puzzle for effective decarbonisation of the global economy – and emphasised that it was imperative for Africa not to be left behind in the development of this nascent industry.

In our report we highlighted that a key issue required for Africa to achieve this was developing a policy and regulatory framework that promoted investment in the different value chains of the hydrogen economy.

Since 2022 there have been significant developments in the promotion of the hydrogen economy by several countries. While a mature market structure remains elusive, the tripling of the number of countries with national hydrogen roadmaps over the past two years signifies a global endorsement for the use of green hydrogen to decarbonise the global economy. This strategic positioning underscores the recognition of the economic opportunities associated with this clean energy source. However, a critical

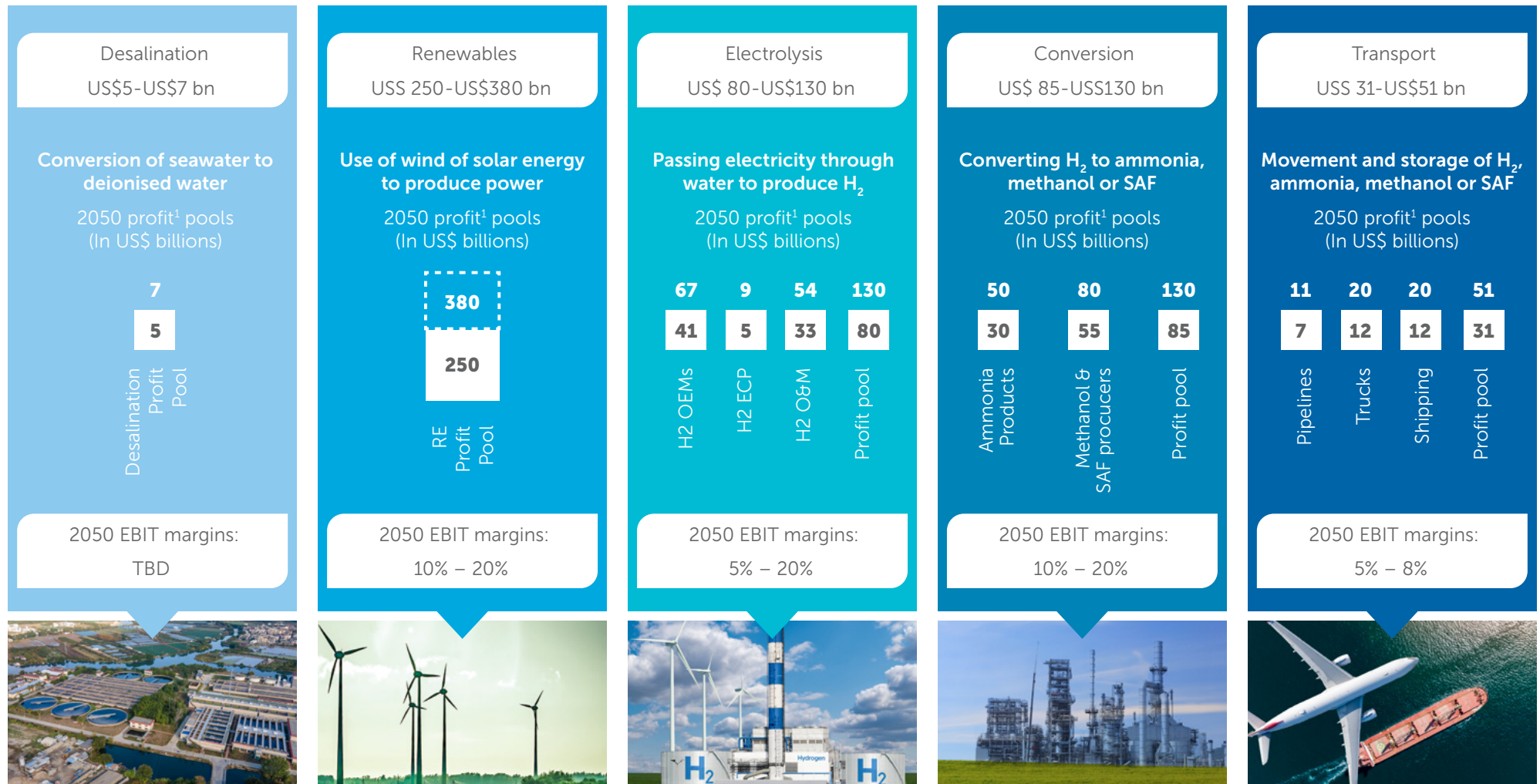
precursor to large-scale deployment rests upon the development of robust policy and legal frameworks, alongside the harmonisation of international standards. The absence of such regulatory clarity presents a significant impediment, hindering the ability of green hydrogen projects to progress due to the inability to effectively plan or undertake risk assessments.

Green hydrogen (GH₂) occupies a prominent position within the policy agendas of both established industrialised nations and developing countries. It constitutes a critical element in the decarbonisation of the global economy, particularly for industries historically resistant to abatement efforts, such as iron and steel, chemicals, and cement production. Long-distance transportation also stands to benefit significantly from GH₂. As a consequence, demand for green hydrogen is projected to undergo a dramatic surge, with supply struggling to keep pace for at least the next two decades. This anticipated supply/demand imbalance necessitates the implementation of strategic initiatives to bridge the gap and ensure the successful integration of GH₂ into the global energy mix.¹

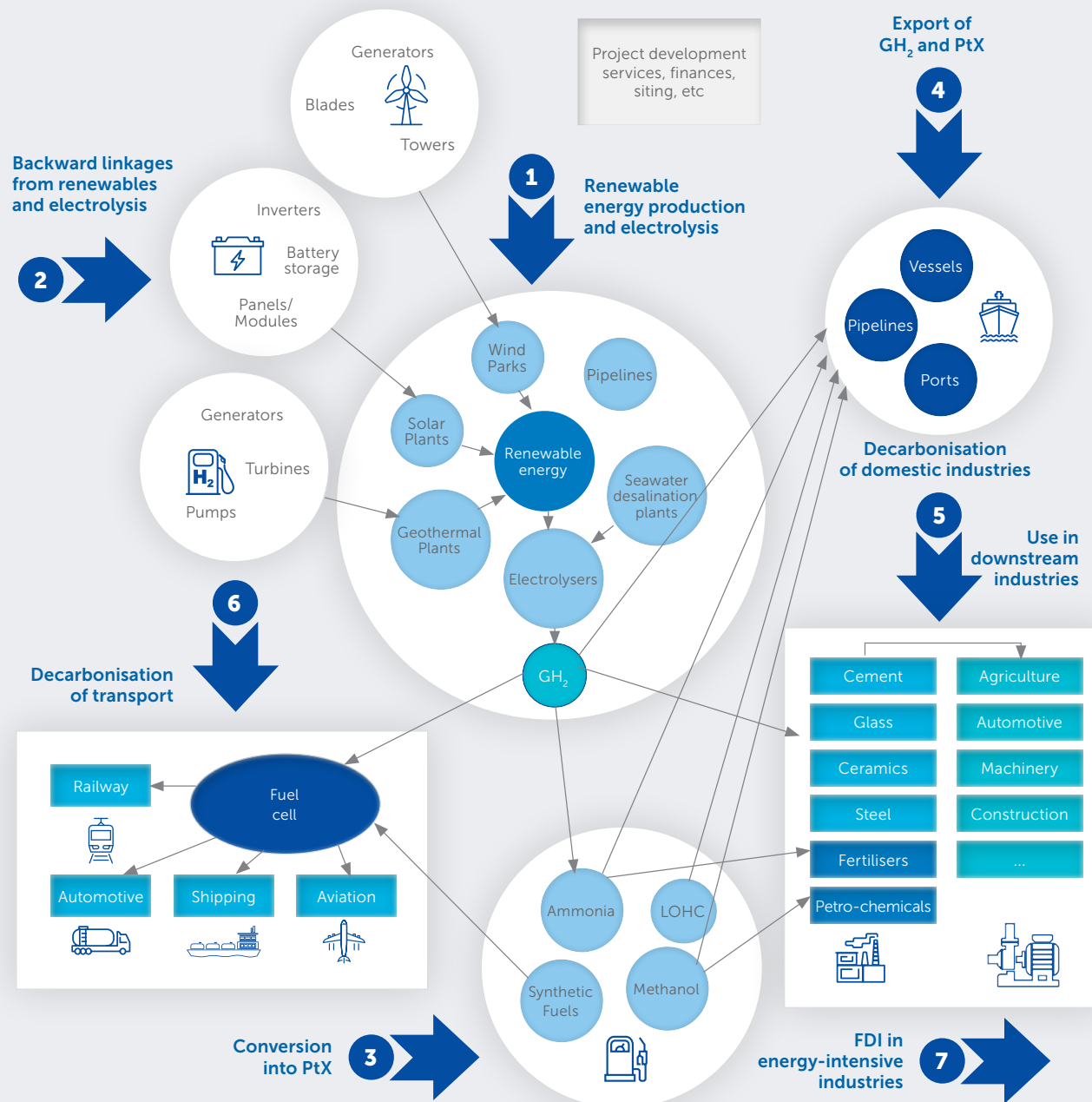
¹ Green hydrogen: Implications for international co-operation:
With special reference to South Africa (idos-research.de)

Directional estimates for 2050

Globally, the green hydrogen value chain will be worth US\$450-US\$700 bn by 2050, with renewable energy (RE) and electrolysis players making up to 54% and 19% of the profit pool respectively.



Hydrogen value-chain

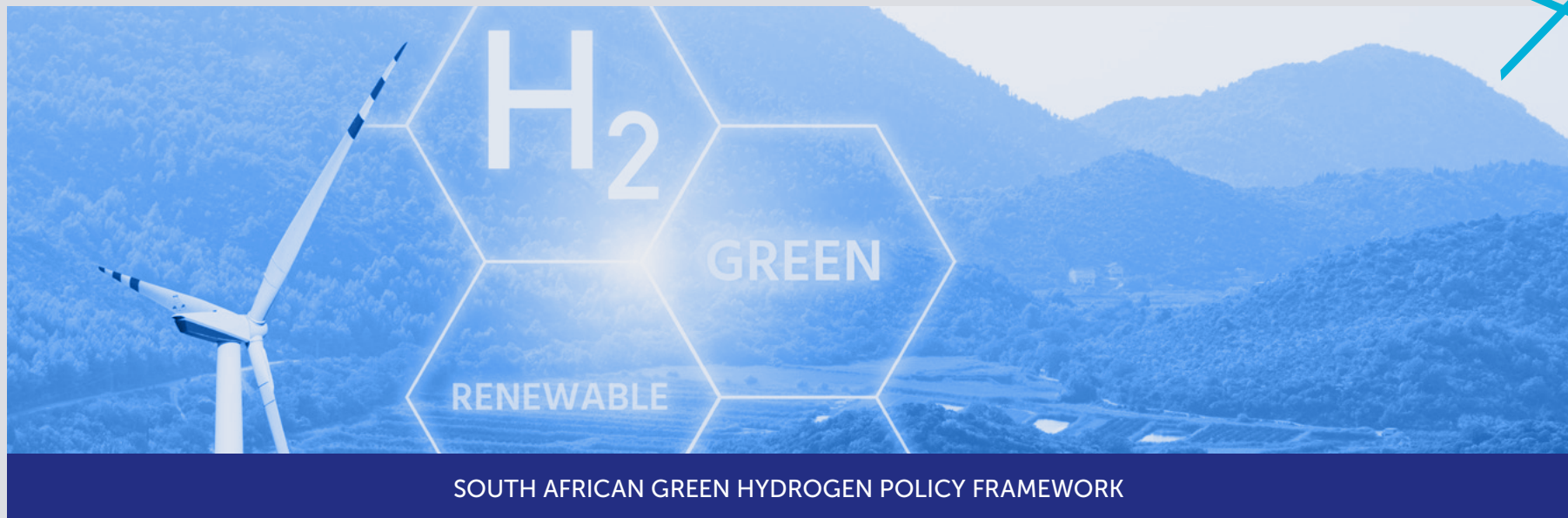


Source: Stamm, A., Altenburg, T., Strohmaier, R., Oyan, E., & Thoms, K. (2023). Green hydrogen: Implications for international cooperation. With special reference to South Africa (IDOS Discussion Paper 9/2023).⁶

⁶ Green hydrogen: Implications for international co-operation: With special reference to South Africa (idos-research.de)

South Africa





Hydrogen Society Roadmap (HSRM) for South Africa

The HSRM as published by the Department of Science and Innovation (DSI) in February 2022, key:

- articulates the South African Government's official strategy to catalyse the development of a robust hydrogen economy. The HSRM identifies the following key objectives:



Decarbonisation of heavy-duty transport.



Enhanced and green power sector (main and micro-grids).



Creating an export market for South African green hydrogen.



Decarbonisation of energy-intensive industries (cement, steel, mining, refineries).



Centre of Excellence in Manufacturing for hydrogen products and fuel cell components.



Increasing the role of hydrogen (grey, blue, turquoise and green) in the South African energy system in line with the move towards a net-zero economy.

The roadmap identifies a total of 70 priority actions to be undertaken to support the implementation of the roadmap. These include:



Alignment and integration:

Aligning and integrating the roadmap with relevant national priorities and plans.



Skills development:

Identifying skills required for a hydrogen workforce and developing a plan to build these skills.



Catalytic projects:

Supporting catalytic projects that demonstrate commercial viability, with a focus on industrial clusters.



Research ecosystem:

Continuing the building of the research ecosystem to support innovation.



Regulatory and fiscal measures:

Reviewing regulatory and fiscal measures to support the development of a hydrogen economy.



International partnerships:

Mapping the international financial programmes and partnerships instrumental for supporting the hydrogen economy.

The Green Hydrogen Commercialisation Strategy

Aligned with the HSRM, the South African government approved the Green Hydrogen Commercialisation Strategy (GHCS) on 18 October 2023. The GHCS sets out that the South African Government must prioritise the implementation of policies and regulatory frameworks that foster the cost-competitiveness and widespread adoption of green hydrogen technologies. It also proposes that the following strategic initiatives be undertaken by the Government:

“



Incentives:

These could include subsidies, taxes and levies, as well as accelerated depreciation on capital equipment (both supply and demand side incentives could be used to drive cost reductions in the long term and enable a just transition, which will enable energy supply, sustainability and stability).



Carbon subsidies:

Use carbon taxes to subsidise green hydrogen production.



Preferential funding:

Undertake to provide low-cost funding through state-owned development finance institutions, incentivise private sector institutions to fund green hydrogen projects at preferential interest rates and seek preferential funding terms from global private sector and development finance institutions.



Government-to-government arrangements:

Import countries will be looking for energy security and export countries for market share, which could allow for preferential arrangements (e.g. long-term supply agreements).

”

The GHCS read with the HSRM identifies key industrial and manufacturing opportunities green hydrogen (GH₂) holds for South Africa and broadly the Southern African region.

Industrialisation opportunities



Ammonia production



Green steel production



Aviation fuel exports (Sustainable Aviation Fuel)



E-methanol for local consumption



Electrification support and ramping RE for scale



Water security



Fertiliser production



Mine haul vehicles and heavy-duty vehicles



Marine Bunkering Fuel



Equipment manufacturing

Value chain component - Electrolyser systems

Value chain component - Fuel cell systems

Value chain component - Energy Storage



The GHCS highlights that there is significant GH localisation and manufacturing opportunities.



- **RE:**

Detailed analysis work is ongoing with the South African Renewable Energy Masterplan (SAREM). SAREM's focus is on the localisation potential of the renewable energy manufacturing value chain under different scenarios of renewable energy ambition. RE is a key component in the GH₂ value chain and low cost RE and high capacity factors (CF) are two key enablers for successful GH projects.



- **Hydrogen production through electrolysis:**

Three main electrolyser technologies are available for GH₂ production: Polymer Electrolyte Membrane Electrolysers (PEM) electrolysers, Alkaline Electrolysers and, Solid Oxide or High Temperature Electrolysers (SOEC or HTEL). PEM electrolysers are emerging as the preferred technology for future GH₂ production from intermittent renewable energy. South Africa's unique benefit in the global supply of Platinum Group Metals (PGMs) and the preference shown for PEM technology in the future GH economy, is a good indication that South Africa should attempt to leverage its PGM resources to promote localisation of PEM electrolysis technology equipment and components.



- **Energy from fuel cell systems:**

South Africa's unique benefit in the global supply of PGMs and the potential for PEM technology in the future GH economy, is a good sign that South Africa can rely on its PGM resources to promote localisation of Temperature PEM Fuel cells and phosphoric acid fuel cells technologies' stacks, systems, components, and equipment.

However to ensure these opportunities are realised the significant investment in infrastructure is required:



Transmission Grid Infrastructure

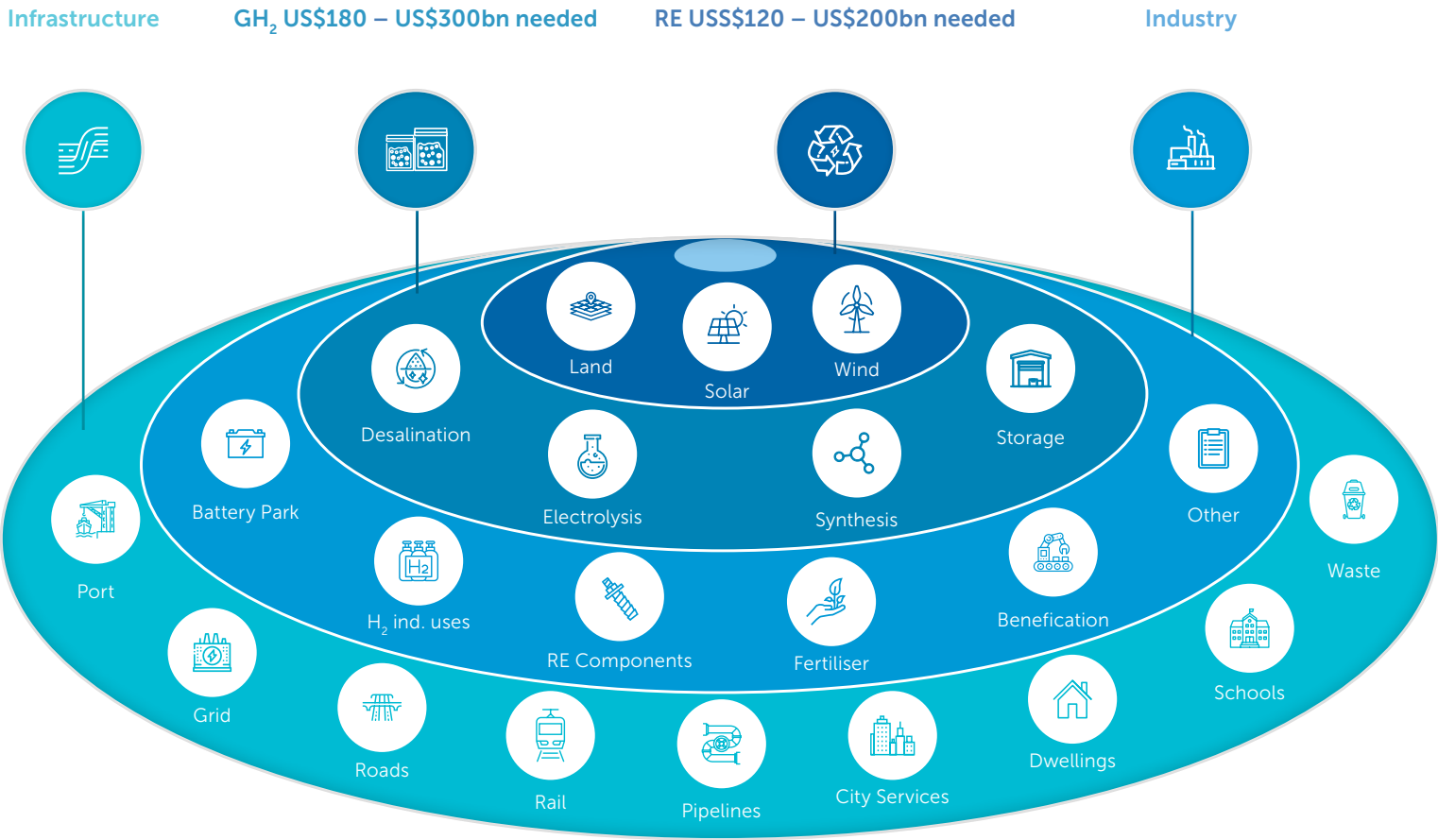


Ports infrastructure: Ports are a fundamental component of the export green hydrogen value chain. Port infrastructure is required to support GH₂ projects with the infrastructure to move GH₂ and its products such as ammonia, LOHC and other GH₂ transport vectors onto maritime transport for the export market. Further, ports can ignite the development of hydrogen hubs by acting as international centres for hydrogen production, application, import and transport (WSP, 2022).



Transport infrastructure including integration with pipelines

Key investment areas in the green hydrogen value chain



Directional | Detailed study required to quantify

Does South Africa's current regulatory framework adequately support the growth of a National Green Hydrogen Industry?

For investment to be made in GH₂ Hydrogen investors/lenders require a clear understanding of the developing Regulatory Ecosystem of Green Hydrogen in South Africa

The GHCS, recognises that at present South Africa's regulatory framework does not adequately support the growth of a national GH₂ hydrogen industry. Establishing clear and easily ascertainable regulatory framework for hydrogen is crucial for developers and investors, enabling projects to proceed with minimised risk. A well-defined regulatory framework that promotes hydrogen development in South Africa will also boost investor confidence and financing, thereby lessening the financial burden on the government, especially in the current tight fiscal environment. Considering the potential scale and impact of a fully developed hydrogen economy for the re-industrialisation of South Africa and the region, the creation of an effective regulatory framework will be a substantial undertaking.

Based on the general assessment done as highlighted in GHCS, the following still needs to be done (albeit with some progress on some of these points):

- We need to define what constitutes a GH₂ hydrogen projects across the value chain to provide regulatory clarity to current and potential investors into South African GH₂ projects. This is important for the GH₂ or derivative products that are aimed for exports to specific jurisdictions that have a specific requirement for what is considered GH₂ or low carbon hydrogen. This also involves what is considered "green" within the context of GH₂.
- Clarify the classification of hydrogen as a gas or energy source/vector for the purpose of legislation and regulation, and the implication of the chosen classification.
- Provide regulatory clarity around permits, licenses and assessments required for the construction, connection to electricity grids, operating licenses and similar aspects.
- Consider developing bespoke legislation or in the short term provide regulatory clarity through regulation under existing legislation in relation to approaches to the compression, storage and transport of GH₂ and derivative products such as e-methanol, green ammonia, etc.





- Proper regulatory impact assessment of the areas of law and policy to ensure a fully developed GH₂ economy.
- Incorporate global best practice on regulatory approaches from countries that ahead of South Africa to avoid reinventing the wheel, and ensure that may be ahead of such regulatory approaches are adapted to the South African context.
- Align with South Africa's existing energy planning policies such as the Integrated Resource Plan (IRP) and Integrated Energy Plan (IEP) – specifically make provision for green hydrogen and its derivative products in the value chain. The draft IRP released for public comment during 2024 does not explicitly mention green hydrogen as part of the potential baseload options. This does not align to with other policy instruments to explore technological advancements made by companies to incorporate hydrogen as part of baseload.
- Synchronises South Africa's decarbonisation and just transition ambitions, through the various polices and specifically linked to the National Determined Contributions.
- Remove investment barriers and supports the investment in South Africa's GH₂ economy.
- Being flexible and responsive to the dynamic nature of GH₂ developments as they evolve from a technology, techno-economic, policy, regulatory, finance and investment perspective.

The key regulatory incentives for GH₂:

Domestic market incentives



Carbon pricing



Tax incentives



Import duties



Permitting, licencing and authorisation
Standards for the GH mobility sector

Export market incentives



Special Economic Zone incentives
Guarantees of Origin (GO)



The importance of international cooperation

For hydrogen to contribute to South Africa's energy transition, the hydrogen value chain must operate within three main legal areas:



Energy, Infrastructure and Manufacturing



Climate and Environmental



Health and Safety

Integrating these areas is essential to create a robust and coherent policy and regulatory framework, including the masterplans being developed by the government.



Energy, Infrastructure and Manufacturing



Climate and Environmental



Health and Safety

The developing hydrogen sector will require access to new and existing energy infrastructure - including electricity networks, gas networks, ports, roads and rail.

Legislation underpinning renewable energy and related requirements for hydrogen manufacturing in South Africa.	<p>Incentives potentially related to:</p> <ul style="list-style-type: none"> ✓ Hydrogen or derivate production. ✓ Import of Electrolyzes. ✓ Import of Fuel cells. 	<p>Some of the licenses and authorisations that would be applicable to green hydrogen includes water use licenses, environmental authorisations comprising various impact assessments in terms of the Environmental Impact Assessment Regulations, including Strategic Environmental Assessments (SEA) within defined Renewable Energy Development Zones (REDZs), which are intended to expedite environmental permissions.</p>	<p>Particular attention and priority should be given to develop technical safety standards in respect of hydrogen and the hydrogen industry - with a likely focus initially on:</p> <ul style="list-style-type: none"> • interactions with the gas network and key gas industry stakeholders; • hydrogen safety requirements related to storage, handling and transport; <p>the adoption of hydrogen fuel cell technology (heavy vehicles and stationary applications).</p>
<ul style="list-style-type: none"> • National Energy Act Integrated Energy Plan (IEP) – Hydrogen is mentioned in the existing version within the context of an alternative energy source and as an energy carrier <i>"The hydrogen economy is undergoing serious consideration in South Africa, in an effort to develop safe, clean and reliable alternative energy sources to fossil fuels."</i> The revision of the IEP remains outstanding and updating to capture the evolving energy policy landscape is required. • Electricity Regulations Act (and Amendment Act) Integrated Resource Plan (IRP) – must provide for specific renewable energy to electrolyzers located in GH₂ hubs. 	<ul style="list-style-type: none"> • Income Tax Act incentives relevant to GH₂ <ul style="list-style-type: none"> ✓ Accelerated depreciation allowance (RE) . ✓ Energy savings allowance (EE). ✓ Industrial policy project (IPP) allowance (EE). ✓ Exemption of proceeds (RE/EE). ✓ Accelerated depreciation allowance for R&D (RE/EE). ✓ Depreciation allowance for R&D buildings (RE/EE). 	<ul style="list-style-type: none"> • National Water Act, 1998: Governs the use, management, and protection of water resources. • National Environmental Management Act (NEMA), 1998 (as amended): This is the main framework for environmental management and governance. 	<ul style="list-style-type: none"> • Standards Act 2008 • National Regulator for Compulsory Specifications Act 2008 • Consumer Protection Act • Occupational Health and Safety Act <p>As part of the process Government must introduce standards and codes to develop South Africa's green hydrogen mobility sector, including emission reduction targets in the transport sector and green hydrogen refuelling station standards.</p>



- **Gas Act**

- ✓ As an interim measure, potential amendments required to expand definition of gas not to merely be hydrogen enriched. [In the long term consider for the development of a bespoke piece of legislation that regulates hydrogen.]

- ✓ Storage facilities

- ✓ Handling facilities

- **Petroleum Pipelines Act**

- ✓ Handling facilities

- ✓ Storage facilities

- **Petroleum Products Act**

- ✓ Sustainable Aviation Fuel

- ✓ e-methanol

- **National Ports Act**

- **National Land Transport Act**

- **National Railway Safety Regulator Act**

- **Infrastructure Development Act**

- Need for reduced or exempted the import duties on items such as electrolyzers required for hydrogen production
 - ✓ The cost of manufacturing electrolyzers in South Africa are significantly more when compared to the manufacturing costs that other countries have achieved.
 - ✓ In order to reduce the costs associated with the production of GH₂, the opportunity for consideration to reduce or exempt the import duties which will be payable on imported GH₂ technologies is accommodated within terms of the Customs and Excise Act.
- Export Incentives such:
 - ✓ Special Economic Zone (SEZs) incentives will be a key enabler to support South Africa's GH₂ economy. SEZs such as Richards Bay, Saldanha, Vaal, Coega are positioning themselves for the hydrogen economy.
 - ✓ **Guarantees of Origin** to be introduced aligned to the requirements of GH₂ importing jurisdictions.

These types of regulatory measures have been known to create a market for the environmental attributes associated with the renewable energy technologies and have resulted in increased renewable energy penetration rates.

A Guarantees of Origin system provides hydrogen consumers with certainty pertaining to the green nature of the hydrogen in line with the specific legal requirements by the specific green hydrogen importing jurisdiction such as Germany, Japan etc.

Government to build on existing regulatory tax incentives to support the green hydrogen value chain.

- **National Environmental Management Act:**

- ✓ Protected Areas Act, 2003: Provides for the protection and management of protected areas.
- ✓ Biodiversity Act, 2004: Aims to conserve biological diversity and ensure sustainable use of natural resources.
- ✓ Integrated Coastal Management Act, 2008: Manages coastal zones and ensures their sustainable use.
- ✓ Air Quality Act, 2004: Regulates air quality to protect the environment and human health.
- ✓ Waste Act, 2008: Focuses on waste management and reduction.

- **Carbon Tax Act, 2019:** The act aims to reduce greenhouse gas emissions by imposing a tax on the carbon dioxide (CO₂) equivalent of greenhouse gas emissions.

- **Climate Change Act, No 22 of 2024:** The act aims to develop an effective climate change response and facilitate a long-term, just transition to a low-carbon and climate-resilient economy and society.

- For GH₂ economy the following are important considerations around:

- ✓ Carbon Pricing.
- ✓ The need to introduce explicit and implicit carbon pricing mechanisms coupled with GH₂ revenue recycling mechanisms.

How do we finance these major green hydrogen projects?

Given the size and complexity of the green hydrogen value chain and the anticipated scale of the green hydrogen economy in South Africa, financing these projects will require innovative financing structures sourced from multiple stakeholders. As such, globally, various forms of funding mechanisms are being applied to enhance the financing landscape, including:

Direct public funding

This is not a possibility in South Africa with the constrain fiscal space of government. However, it opens the opportunity for government to use PPPs.

This is a model that is well now, but can be better utilised.

A PPP is an agreement between an institution and a private party in terms of which the private party undertakes an institutional function on behalf of the institution for a specified or indefinite time. The private party receives a benefit for performing the function, either by way of compensation; charges of fees collected by the private party from users or customers of a service provided to; or a combination of both.

Currently PPPs are still governed by regulation 16 of the Public Finance Management: National Treasury Regulations (The Regulations), notwithstanding the Public Procurement Act 28 of 2024 that was signed into law. The Public Procurement Act gives the Minister of Finance the authority to establish a framework that procuring institutions must use for PPPs. This framework would most likely be a copy of the proposed amendments to the current PPP regulations that was published for public comments on 19 February 2024.



[Click here to read our thought leadership article](#)

Leveraging funding from developed markets

Developing countries such as German and other European countries have specifically set aside to support the green transition in developing/ carbon intensive countries, given the anticipated involvement of international OEMs, export credit agencies are another key stakeholder group in the funding universe.

Green/project bond financing:

Green financing is an effective means of encouraging the development of infrastructure focussed on reducing carbon emissions and provides a form of de-risking by providing long-term grant and concessionary funding to an investment.

Blended finance mechanisms:

Blended Financing Key to making green hydrogen projects bankable and commercially viable.

As such:

- grants and other forms of concessionary funding will be a critical source of project finance.
- Also, DFI's play a key role in de-risking financing in Africa with direct financial support and investment from African governments is very limited due to national budget constraints.

JET IP Funding

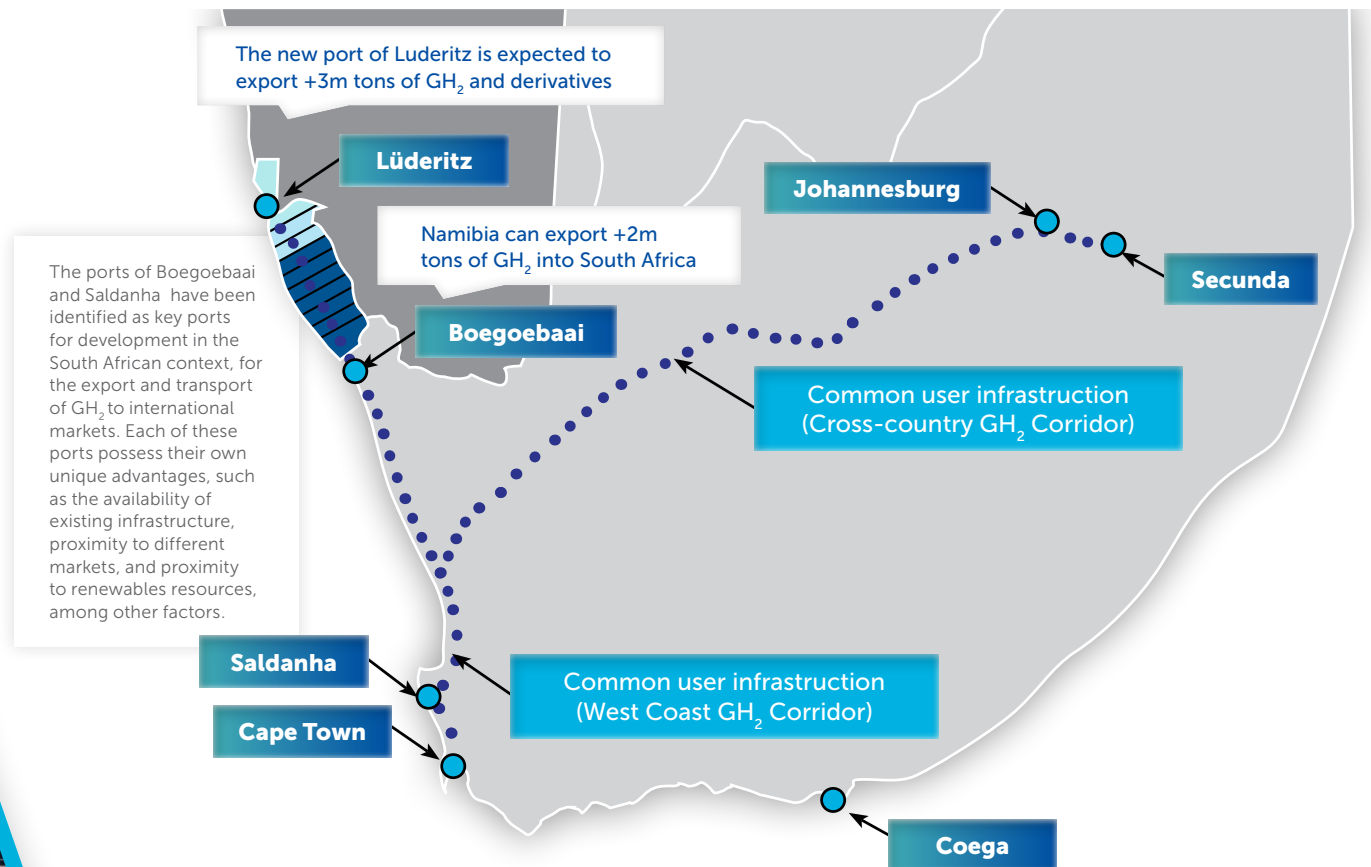
International Partners Group (IPG):
~USD 8,5 billion pledged to the JET IP, with a Minimum ~USD 0,7 billion proposed for GH₂ – in addition, the IPG and others have Significant funds available for private sector projects.



Regional integration between South Africa and Namibia

Regional integration is imperative for real industrialisation. This is recognised by South Africa's GHCS, but similarly is also a key part of the [Blueprint for Namibia's green Industrialisation](#). As stated by Harambee Prosperity Plan II, Former President Geingob of Namibia noted: *"We cannot achieve the goal of a prosperous Namibia if we do not deepen regional integration and Pan- African solidarity. For this reason, our goals for a prosperous and inclusive Namibia will remain closely aligned with the plans of the Southern African Development Community (SADC) and Agenda 2063: The Africa We Want of the African Union."*

Regional integration supports the development of hydrogen hubs and valleys in Southern Africa.





Regional integration between South Africa and Namibia...continued

Without uniform and coordinated regional industrial policies to tap into emerging industries such as the hydrogen economy we will potentially not fully realise the potential of an industrialised Africa. As part of the African Continental Free Trade ("AfCFTA") Agreement, the AfCFTA Investment Protocol (as adopted but not yet ratified by member states), contains a broad framework of incentives to encourage and support investments in African countries. It also contemplates that member states may harmonize incentives for strategic interest to member states or as prescribed by the relevant African Union bodies. As part of the incentive framework being negotiated under the Protocol, it will be important for the Protocol to set principles for Africa states to encourage private sector investment in low carbon or carbon neutral industries such as clean hydrogen to accelerate the industrialisation of Africa at a low carbon base.

Uniform legal principles, incentives, infrastructure, and industry standards (i.e., on pipelines, storage etc) should then find its way into regional industrial policies and filter into the domestic laws of the countries within that region. This ensures a harmonised approach to developing the hydrogen economy within the region. In the case of South Africa and Namibia, deeper collaboration in the development of the Southern Corridor area in Namibia and Boegoe Bay area in South Africa as green hydrogen export hubs will be beneficial for both countries, including the Southern African region and the continent broadly. Regional value chains supported by robust and integrated regional policies that supports and nurtures emerging industries is imperative for Africa to realise the economic growth to achieve Agenda 2063. Hydrogen could be one of the game changers for Africa and if approached regionally has the potential to materially impact on Africa's industrialisation, as it allows for the investment in heavy industries such as the automotive industry, steelmaking, ammonia production and other complimentary downstream industries at net-zero. With hydrogen, Africa could industrialise at net zero without compromising the climate and achieving sustainable development, thereby achieving Agenda 2063.

Namibia



Namibia

Namibia is in the processes of developing a Fit-For Purpose Green Hydrogen Regulatory Framework

In line with the directives of the Economic Advancement Pillar of the Second Harambee Prosperity Plan of Namibia, the Namibia Green Hydrogen and Derivatives Strategy 2022 (the Strategy) was developed. The Strategy sets out the clear and ambitious objectives by Namibia to create an at-scale green fuels industry in Namibia.

As part thereof, Namibia has indicated that intends to introduce a fit-for-purpose regulatory framework in the form of a Synthetic Fuels Act that will regulate green hydrogen and its derivative products on Namibia. The legislation to be known as the Synthetic Fuels Act intends to provide for a national strategic and legislative framework that will:

- Provide for standards that conform to international guidelines to reduce operational uncertainty for developers and set quality levels to comply with international export market requirements.
- Provide oversight activities, e.g., transparent access to land and permit processes for renewables and hydrogen that guarantee fair treatment to investors and local populations while protecting the environment and ensuring safety.

- Advance development with private and public sector stakeholders, e.g., by modifying transmission and distribution fees for hydrogen producers to reflect ancillary services provided for the grid or introducing mechanisms to compensate developers for overbuilding renewable energy capacity in a specific area.
- introduce frameworks for pilot projects where regulation is not yet in place.

As part of the Strategy, in order to streamline the development of the green hydrogen industry in Namibia, Namibia establish a new Implementation Authority Office (IAO) during 2023 to provide transparent, streamlined and user-friendly process for all stakeholders in prospective hydrogen projects (similar to the IPP office in South Africa). The function of the IAO is generally:

- to identify and plan for hydrogen projects to be developed, financed, operated and/or maintained by the private sector on state-owned land, and ensure the economic participation of the Government of Namibia.

- oversee the auction of state-owned land, plan and implement procurement processes for infrastructure development, e.g., conduct legal and regulatory reviews, identify and conduct due diligence on sites, facilitate preparation and submission of all permitting and approval applications and project finance documents, and engage with developers, contractors and/or financiers.
- To build and maintain relationships with the private sector and manage project contracts.

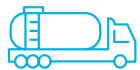
The IAO is meant to support the Ministry of Mines and Energy in implementing the Strategy.



For Namibia: Vision 2030 linked to Agenda 2063 of the AU is to achieve the objective of the AfCFTA by becoming an industrialised nation focused on green Industrialisation:

Infrastructure Enablers

Moving goods that are key to the global green agenda



COMPETITIVE TRANSPORT AND LOGISTICS

- A modern infrastructure network including railways, powerlines, port access, and trade hubs.
- A regional approach will generate economies of scale and increase global competitiveness.



MULTI-PARTY FINANCING






- A programme of this scale will require significant funding tailored to the region.
- Public-driven PPPs and constitution of consortiums with multilateral funding.



PUBLICLY DRIVEN ENABLERS

- The public sector takes the lead to consolidate plans and mobilise resources.
- Holistic approach includes cross-country coordination through governments collaboration.

Infrastructure Enablers

		RATIONALE	INVESTMENT REQUIREMENTS
Rail		<ul style="list-style-type: none"> Extend cost-effective transport distances to capture regional trade from further afield. Bulk capacity to transport minerals and inputs needed for target industries. 	<ul style="list-style-type: none"> Track upgrade to SADC standard (speed and axle load.) Rolling stock replacement. New rail connections to Zambia, Botswana and beyond.
Ports		<ul style="list-style-type: none"> Broaden commodity type and capacity that can be exported. Non-container capacity currently constrained. Ensure specialised deepwater capacity for gHz industries and offshore oil/gas. 	<ul style="list-style-type: none"> New deepwater ports: Walvis Bay North Port, Angra Point, and (in long term) Cape Fria. Sustaining capex at Walvis Bay. Quay extension at Lüderitz.
GH ₂		<ul style="list-style-type: none"> Monetise world-class solar and wind resources via liquid energy trade. Underpin investment opportunities in gH, upstream/downstream, and energy intensive industries. 	<ul style="list-style-type: none"> Hydrogen technology pilots. GW scale solar and wind farms. Electrolysis/ammonia/desal plants. Electricity transmission and GH₂ pipelines to supply neighbours.
Electricity		<ul style="list-style-type: none"> With hydro vulnerable and imports requiring renegotiation, renewables can reduce import-dependency They also lower tariffs, green the sector, and expand access to electricity. 	<ul style="list-style-type: none"> Continued private investment in renewables generation. Public sector investment in transmission and battery storage infrastructure.
Industrial zones		<ul style="list-style-type: none"> Avoid risk of enclave industry with limited domestic value add. Establish common user infrastructure to lower development cost and risk. Clustering industries to minimise footprint and maximise efficiencies. 	<ul style="list-style-type: none"> Town planning and infrastructure @ Luderitz. !Nara Namib Industrial Economic Zone @ Walvis Bay. Common user infrastructure for Southern Valley GH₂.



Investable Industries

Adding value to global green growth goods



COMPETITIVE INDUSTRIES AND HIGH-VALUE SERVICES

- Taking up large investment opportunities in green manufacturing, renewable energy, trade and logistics.
- A broad regional strategy creates synergies and reduces production costs.



PRIVATELY DRIVEN INVESTMENTS

- Unparallel opportunity to mobilise FDI and boost overall level of investment.
- Particularly attractive for large players and OEM to localise technology and connect to markets.



FINANCIAL

- Vast capital needs for emerging industries to be met by private funding.
- Funds mobilisation respond to ambitious regional narrative, rather than individual investments.

Investable Industries

Renewable energy hardware

Solar panel manufacturing

Cell manufacture and panel assembly to serve domestic GH₂ needs, then expand regionally as costs decline.

Electrolyser manufacturing

Assemble electrolyser stack and balance of plant to serve GH₂ needs, then expand upstream and regionally.

Electrolyser manufacturing

Produce wind turbine towers and blades locally to serve GH₂ needs, then supply blades regionally.

Mineral refining

Lithium refinery

Refine local concentrate to technical grade lithium for export to EU, taking advantage of diversification push.

Rare earth elements refinery

Leveraging announced REE projects, develop domestic separation facility to produce rare earth oxides.

Mineral refining

Synthetic fuel production

Use bush biomass to produce biogenic CO₂, feedstock and GH₂ to produce synthetic fuel for EU aviation.

Hot briquetted iron production

Produce green HBI/DRI using GH₂ for EU, then grow to supply other 'green steel' demand centres (e.g., S.Africa).

Low CO₂

Flat glass production

Use low-cost, low-CO₂, energy to produce flat glass for Africa and EU, then expand into local raw materials.

Closing remarks

South Africa and Namibia stand at the forefront of a transformative journey towards green hydrogen, a venture that holds immense promise for both nations and the broader African continent. The collaboration between these two countries, exemplified by initiatives such as the proposed common-use infrastructure, underscores their commitment to sustainable energy and regional integration.

Opportunities and challenges

Economic Growth:

Green hydrogen has the potential to drive significant economic growth, creating jobs and fostering new industries.

Infrastructure Development:

Building the necessary infrastructure, such as ports, pipelines and renewable energy plants, requires substantial investment and coordination.

Energy Security:

By harnessing renewable energy sources, both countries can reduce their reliance on fossil fuels, enhancing energy security and contribute to the decarbonisation of their respective energy systems.

Technical and Regulatory Hurdles:

Ensuring the technical feasibility and navigating regulatory landscapes can be complex.

Climate Benefits:

Green hydrogen can significantly reduce carbon emissions, contributing to the global climate goals.

Regionalisation and AfCFTA:

The AfCFTA offers a unique opportunity to leverage common-use infrastructure, facilitating the movement of goods and services across borders. This regional approach can help lower costs, improve efficiency, and foster a more integrated African economy. By working together, South Africa and Namibia can set a precedent for other African nations, showcasing the benefits of collaboration in achieving sustainable development goals.

In conclusion, while there are obstacles to overcome, the potential benefits of green hydrogen for South Africa, Namibia, and the continent are immense. By embracing regional cooperation and leveraging the AfCFTA, Africa could industrialise at net zero without compromising the climate and achieving sustainable development, thereby achieving Agenda 2063.



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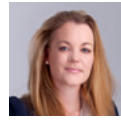
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BBBEE STATUS: LEVEL ONE CONTRIBUTOR

Our BBBEE verification is one of several components of our transformation strategy and we continue to seek ways of improving it in a meaningful manner.

PLEASE NOTE

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