Ensuring (Digital) Startups and Local Innovators Benefit from Potential in the Green Hydrogen (GH2) Sector in Namibia

Documentation of the ii2030 Green Hydrogen in Africa Edition

April 2023
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• Loop 1: Unclear Policy Framework
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• Loop 3: Focus on Large Projects
• Loop 4: Limited Local Skills
Introduction to ii2030
Methodology
ii2030 is an initiative that brings together a curated group of participants to explore systems and co-create solutions that enable technology to help us achieve the Sustainable Development Goals at scale.

### Key Ingredients for ii2030

1. **Tech-based opportunity to positively disrupt current systems**
2. **Curated group of key players from diverse sectors**
3. **Facilitate a co-creation and co-implementation process**
Green hydrogen can be transformative for Africa. The sector will create green jobs and new opportunities for local startups and innovators.

Now is the time to create the fertile ground for entrepreneurs, who often lack access to adequate finance, skills, or even awareness of opportunities in the GH2 sector.

ii2030 is a catalytic process that begins with a problem and an opportunity and ends with a prototype of a systemic solution that can be implemented to strengthen the GH2 support ecosystem for local startups and innovators at the national and pan-African levels.
ii2030 GH2 in Namibia Edition

Journey

**BILATERAL INTERVIEWS**
- December 2022 – February 2023
- 60 min interviews
- Identify inhibitors and enablers in the system

**SYSTEM CHALLENGE WEBINAR**
- 7 March 2023
- 120 minute multi-expert consultation
- Understand system dynamics

**SYSTEM OPPORTUNITY WEBINAR**
- 21 March 2023
- 120 minute multi-expert consultation
- Identify levers for change

**PAN-AFRICAN WEBINAR**
- 20 April 2023
- 120 minute webinar
- Continent-wide peer exchange

**CO-CREATION EVENT**
- 6 June 2023
- 1 day workshop
- Co-create solution to positively disrupt the system

**CELEBRATION WEBINAR**
- July 2023
- 60 minute online event
- Pitch solutions and seal commitment for implementation

**IMPLEMENTATION PREPARATION**
- Ongoing support
- Develop project documents with main stakeholders
Scope: Opportunities for (Digital) Startups and Innovators

- Resources
  - RE Equipment
  - Control in smart grids
  - Maintenance

- Production and Transformation
  - Hardware like electrolyzers
  - Maintenance

- Storage and Transportation
  - Monitoring and safety
  - Innovative transport like LOHC

- Use and Trade
  - Education and awareness building
  - Refueling stations
  - Fertilizer
  - Blockchain for verifiable green certification
  - Mobility

- Data analysis
  - Combined safety, power, and process control system
  - AI and machine learning for optimized asset performance
Status of the GH2 Sector in Namibia
GH2 in Namibia by the Numbers

- The Namibia Green Hydrogen and Derivatives Strategy targets a production of 10-12 million tonnes per annum hydrogen equivalent by 2050.

- Through the pilot project HYPHEN Tsau Khaeb, Namibia has set a hydrogen production target of 300,000 tons per year.

- The electrolyser capacity target for the Hyphen Tsau Khaeb project is 3 GW.

- McKinsey estimates that Namibia could be producing green hydrogen at US$1.5/kg by 2030.

Source: The Green Hydrogen Organisation
Milestones of the Sector

Namibia’s world-class solar and wind resources give it a long-term competitive advantage in producing green hydrogen and green ammonia.

May 2021: The President of The Republic of Namibia established an Inter-Ministerial Green Hydrogen Council (GHC) as outlined in the Harambee Prosperity plan II

November 2021: Hyphen Energy is selected as preferred bidder by the Namibian Government to invest around 9.4 bn USD in a GH2 plant near Lüderitz

November 2022: Namibia’s Green Hydrogen Council launched its GH2 strategy which supports the country’s commitment to the Paris Agreement

2026: The Hyphen project is planned to start producing GH2
Map of GH2 Projects (03/2023)

HDF Energy Namibia: French hydrogen specialist Hydrogène de France (HDF) is moving forward with its green hydrogen project. The facility is planned to sell energy to the Namibian grid. (https://www.renewstable-swakopmund.com/the-project)

Cleanergy Solutions Namibia - a joint venture between CMB.TECH and the Ohlthaver & List (O&L) Group – works on setting up a Hydrogen pilot plant and refuelling station at the coast of Namibia (www.cleanergynamibia.com)

The HyRail Namibia project: Hyphen Technical, CMB.TECH, TransNamib, the University of Namibia and Traxtion, aim to develop Africa’s first dual-fuel hydrogen-diesel locomotive to be fuelled with Namibian green hydrogen (www.hyphentechnical.com, https://cmb.tech)

Daures Green Village: production of green hydrogen and green ammonia and the utilization of its derivatives; Run by Daures Green Hydrogen Consortium (DGHC), National Green Hydrogen Research Institute (NGHRI) and the University of Stuttgart. (www.daures.green)

Hyphen: Planned US$9.4 billion plant producing 300,000 metric tons of GH2/year from 5GW RE capacity and 3GW electrolyser; Produce green hydrogen partly for domestic use, but mainly for export to Europe through a pipeline (www.hyphenafrica.com)
Enablers of GH2 Development

Government drives development of the GH2 sector; GH2 strategy and inter-ministerial Green Hydrogen Council are in place.

Access to natural resources will allow Namibia to produce GH2 at a highly competitive price globally.

Trust and support of the international governments, businesses and finance providers.

Namibian Green Hydrogen Research Institute, Namibian Green Hydrogen Private Sector Task Force and Namibian Investment Promotion and Development Board are enablers for the GH2 startup ecosystem.

Planned projects are large-scale, with an agreed percentage of local contribution.
Inhibitors of GH2 Development

Overall situation of policies, offtake and financing is unclear as the sector is in its early stages

Negligible domestic market for green hydrogen

Lack of awareness on opportunities in the GH2 industry for digital startups and innovators

Unclear whether Namibian companies can provide GH2 at the global/EU standards that the large companies will require

Skills and knowledge on GH2 and related sectors are underdeveloped
Core Story of the System

Overall, we see that the loops combine to form a system that is currently optimized to maintain strong foreign influence on the Namibian GH2 sector through skills and investments for export, with more attention on large-scale projects, and less attention on smaller scale projects and startups.
Loop 1: Unclear Policy Framework

Current policies (at this early stage) do not include specific regulations to support startups and innovators in GH2.

This is due to the fact, that policymakers don't perceive (digital) startups as relevant stakeholders in the sector.

Therefore, they do not include them in the policymaking process.

This means that startups cannot influence or inform policies and the market ecosystem, which then further keep policies in a state that does not consider startups in the GH2 value chain.
Loop 2: Lack of Awareness

The lack of knowledge and understanding of opportunities for startups in the GH2 value chain means that startups do not see how they can plug in the value chain.

This leads to only a few startups seizing opportunities available in the GH2 value chain.

Therefore, there are only a few tangible examples of startups participating in the value chain, further reinforcing the state of lack of awareness of opportunities in the GH2 value chain.
Loop 3: Focus on Large Projects

The overall impression that GH2 is only for large-scale actors leads to money and support mainly channeled to larger projects.

Startups and smaller companies thus do not get enough support, which hinders the realisation of their projects.

This dynamic means that startups are not part of the GH2 market, which further reinforces the impression that GH2 is only for large-scale actors.
Loop 4: Limited Local Skills

Local GH2 curricula are underdeveloped, which limits local skills and experience in GH2 among graduates and skilled workers.

This limitation means that there is a lack of awareness regarding opportunities for local graduates and skilled workers in the sector,

This lack of awareness and participation in the sector creates little incentive for local GH2 skills programs to be developed, which in turn feeds back into underdeveloped GH2 curricula in Namibia.
Aspirational Future for the Green Hydrogen Sector
The Future We Hope For

- Renewable energies fully developed
- Protection of protected areas and environment
- Green hydrogen value chain developed in the country and exports
- Regional cooperation
- Namibia leaves MIC trap
- Top university
- Clear regulations
Namibian GH2 start-ups find a conducive ecosystem and enough skilled workers to become part of the global GH2 value chain.

A guiding star is a vision that is framed as the desired future system toward which your team is working.
A near star is a 5- to 10-year goal that is framed as a distant, but foreseeable outcome that could be attained. It should be a significant step toward the guiding star.

Training centers, incubation hubs and hackathons create awareness and nurture the local digital skills and start-ups in the Namibia's GH2 value chain.
How might we ensure that (digital) startups and local innovators benefit from the potential in the green hydrogen sector?
Levers and Solutions for Change

Stars mark the solutions which resonated most with the consultations’ participants.
Solutions to Create a Conducive Policy Framework

- This is not on purpose; the sector is early stage; over time, policies will emerge
- Coordinate all relevant stakeholder (though this can be cumbersome)

- Write a position paper
- Voice constructive criticism
- Write letters to ministers of Mines & Energy, ICT, the Green Hydrogen Council (depending on topic)

Non-inclusive policies for (digital) start-ups as GH2 sector is still at early stages

- Policymakers do not perceive (digital) startups and innovators as relevant stakeholders
- Local (digital) startups do not get the opportunity to influence the market ecosystem
- Local (digital) startups and innovators are not included in the policy-making process

- Identify startups in GH2
- Form an interest group of startups and innovators in the GH2 sector
- Use the press to create awareness
- Clarify where and how startups and innovator could play a role in the policy making process
Solutions to Create Awareness

- Awareness campaign (radio, TV, bulletins)
  - Ministry of Agriculture, Water and Land reforms could show future engagement: domestic use of ammonia

- Startups can partner/franchise with reputable international firms or brands to establish their service and products in Namibia
  - Showcase partners from other countries (incl. cooperative model)

- Startups do not see how they can plug into the GH2 value chain

- Few tangible examples of startups participating in the GH2 value chain

- Only few startups seize opportunities in the GH2 value chain

- Lack of awareness of opportunities for start-ups in GH2 value chain

- Regional master classes or training for potential entrepreneurs, communities and local authorities
  - Show local benefits on economic growth and job creation (vs. export only)

- Trade fairs or delegations to international exhibitions for startups and innovators
  - Adapt procurement regulation to also allow franchises
Solutions to Re-Focus on Startups

- Pan-African startups and local innovator (esp. software) could work globally; this might get them more attention
- Local content could come not only from Namibian startups but African startups which create subsidies in Namibia
- Large companies could start entrepreneurs in residence programme or trainee programmes to foster innovation
- Consider similar industries (logistics, mining) and show what startups can do there, e.g. maintenance
- Intrapreneurs from large companies could culture of innovation
- Support existing startups, e.g. through programmes that foster the collaboration with large companies or the shared research between large and small ones.
- Procurement of large companies should include startups
- Innovation challenges
- Procurement of large companies should include startups
- Show opportunities for startups to show that it is not only wishful thinking to create a local GH2 startup scene
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Solutions to Develop Local Skills

- GH2 curricula could be incorporated starting in high school to get students interested in careers in the industry.
- Continue discussions with universities abroad to analyze renewable/sustainable programs to collaborate on research projects and technology.
- Give more attention to local curricula and training for local students.
- Collaborate for vocational and master’s-level trainings in GH2.
- Develop programs for artisans to go beyond level 4 training in GH2.
- Vocational training center for GH2 technology as well as standard compliance and certifications.
- Pilot plant with training center to collaborate among research and training institutions.
- Need to clarify and raise awareness regarding GH2 skills.
- Create skills development program for skills transfer from foreign skilled workers to Namibians.
- Emphasize development of the GH2 industry and address core curricula.
- Greater awareness of the path to take advantage of and access GH2 career opportunities.
- Skills development in GH2 could help address unemployment.
- Need to develop low- to medium-skills in the industry.
Thank you for your attention

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