

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

Documentation of the ii2030 Green Hydrogen in Africa Edition
April 2023

ii2030

INCLUSIVE INNOVATION 2030

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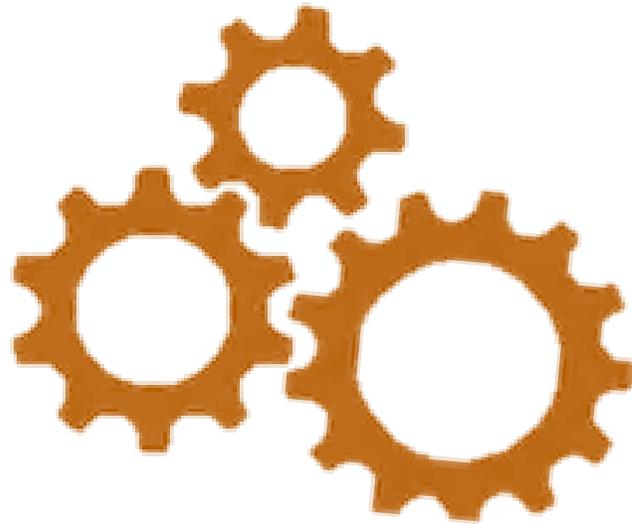
Introduction to ii2030 Methodology

Key Ingredients for ii2030

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.

2

Curated group of key players from diverse sectors



1

Tech-based opportunity to positively disrupt current systems

3

Facilitate a co-creation and co-implementation process

ii2030 GH2 in Africa Edition

Green hydrogen can be transformative for Africa. The sector will create **green jobs** and **new opportunities** for local startups and innovators.

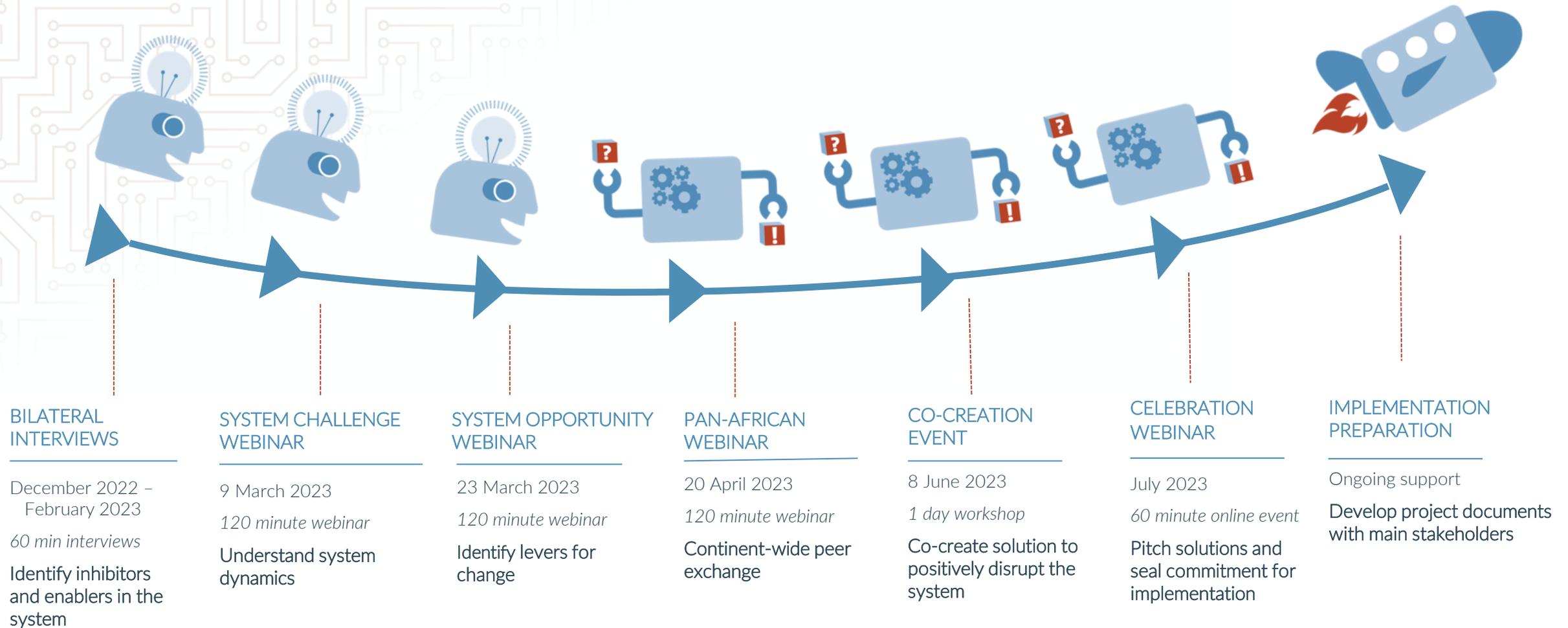
Now is the time to create the fertile ground for entrepreneurs, who often lack access to adequate finance, skills, or even awareness of opportunities in the GH2 sector.

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.

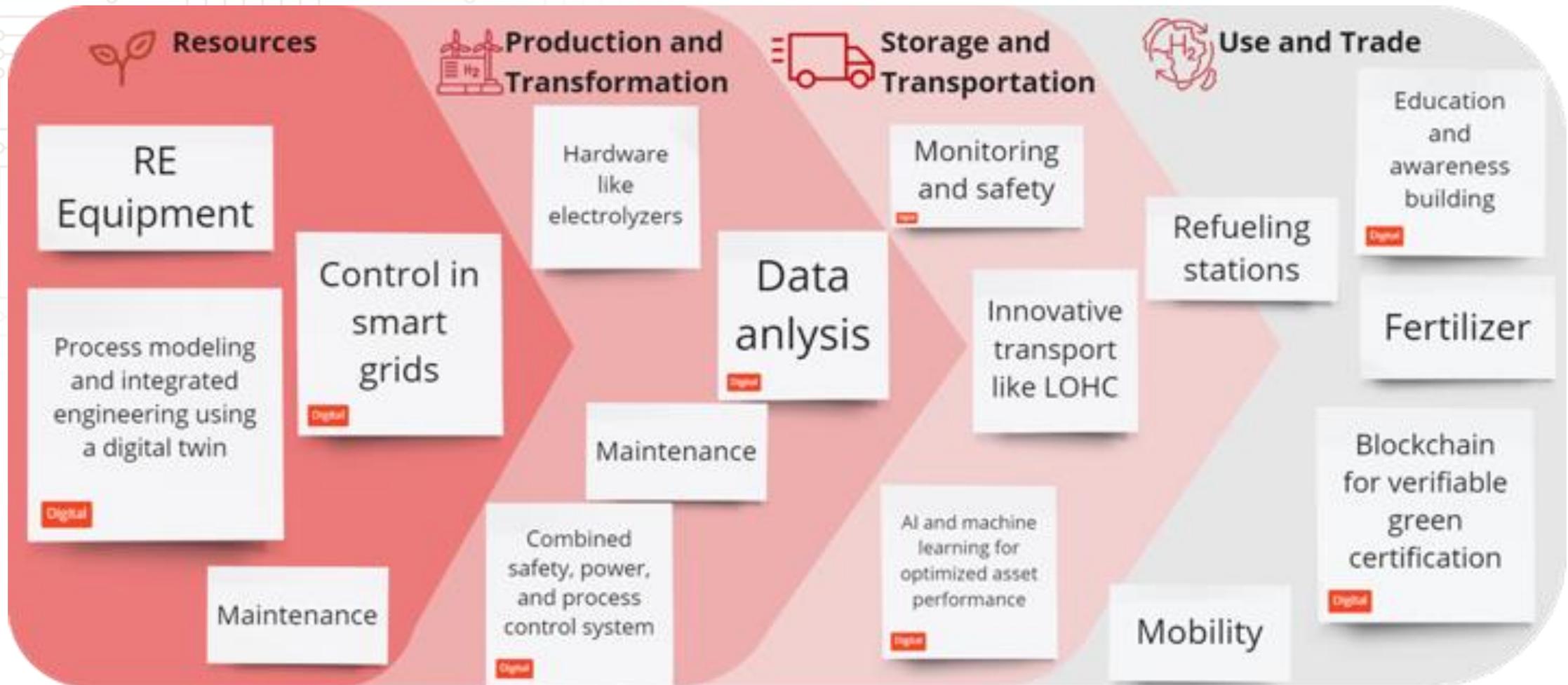


Photo: Co-creation in Rwanda in 2022 (Endeva)

Methodology Journey: ii2030 GH2 in South Africa



Scope: Opportunities for (Digital) Startups and Innovators





Status of the GH2 Sector in South Africa

GH2 in SA by the Numbers

- South Africa is home of **75%** of the world reserves of Platinum Group Metals (PGMs), which are highly relevant for producing electrolysers
- **2.4 million tons of grey hydrogen** are already manufactured per year domestically and used for consumption in the country
- Sasol aims to produce **3.5 tons of green hydrogen per day** for local use, and down the line it will build greenfield projects dedicated to green hydrogen for export purposes, including participating in the German government's H2Global auction program.
- The potential analysis sees the production capacity is estimated to be about **3.8 million tons of GH2 per year** on the long run.

Milestones of the Sector

South Africa is determined to become an internationally competitive world leader in green hydrogen, with its large deposits of Platinum (PGMs), renewable energy resources, and local industries.

2008: Launch of Hydrogen South Africa (HySA)

2018: Hosting of the 30th International Partnerships for Hydrogen and Fuel Cells in the Economy (IPHE) Steering Committee Meetings

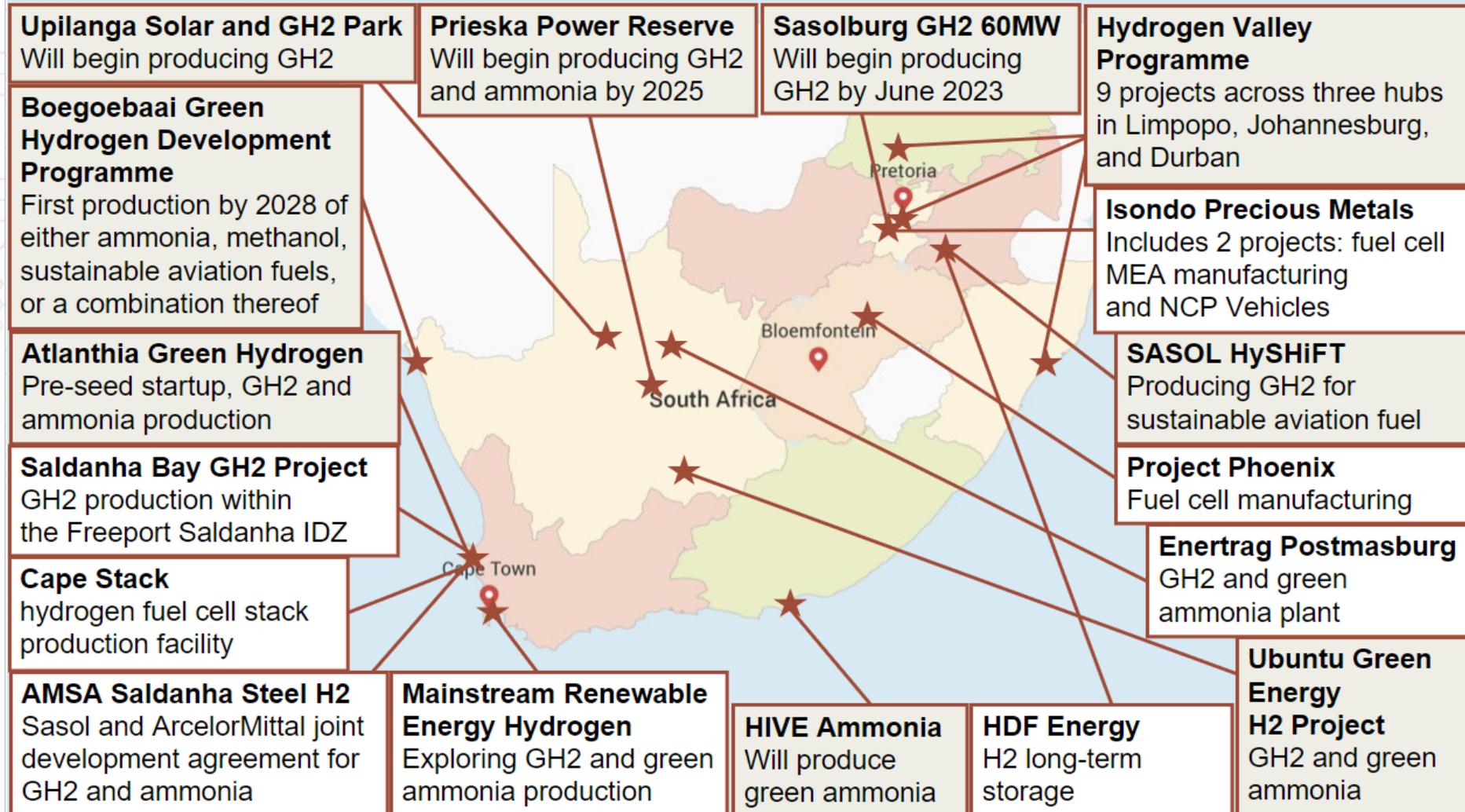
February 2022: the [South African Hydrogen Society Roadmap \(HSRM\)](#) is published by the South African government (Department of Science and Technology of South Africa)

April 2022: Sasol confirmed it will first manufacture green hydrogen via its existing electrolyser units and ammonia plants.



The South African Green Hydrogen Strategy

GH2 Projects in South Africa



- Project registered with ISA
- Project waiting on final information

Key Actors



Enablers of GH2 Development



Longstanding GH2 sector and experience in related fabrication industries with HySA launched in 2008



Access to natural resources will allow GH2 production at a highly competitive price globally



PGM mining industry drives innovation around PEM electrolyzers and H2 fuel cells as well as localization and innovation for GH2 startups



Strong research and incubation system spurs early stage GH2 innovation



High motivation from the presidency in GH2 coordination and prioritization

Inhibitors of GH2 Development



Despite perceived GH2 opportunity, investment remains a prominent issue for innovators in the sector



Gap in commercialization and offtake for smaller GH2 enterprises



Large companies often integrate vertically, bypassing the involvement of local startups

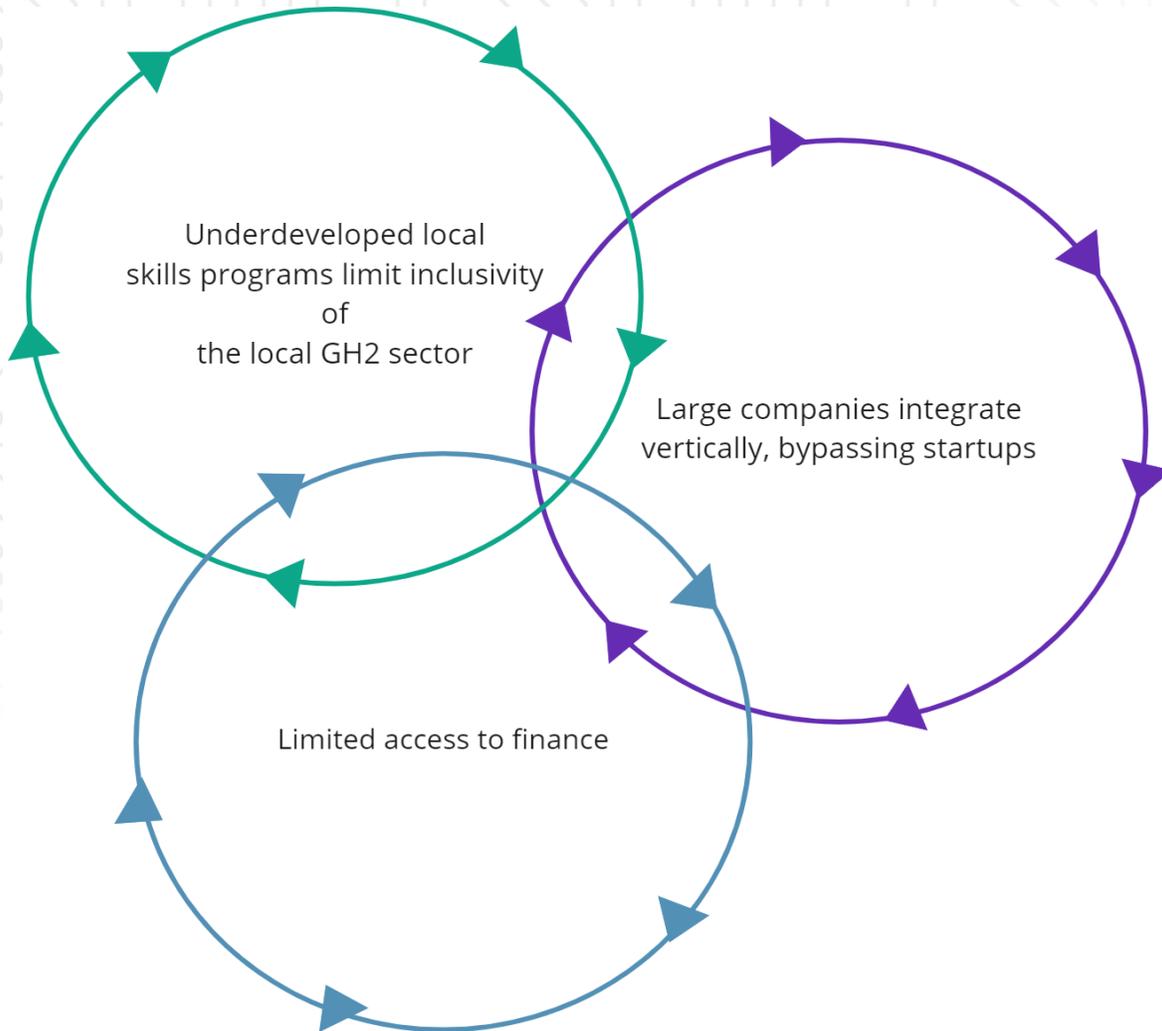


GH2 skills and hiring pools are underdeveloped, complicated by dynamics surrounding gender and race



Gaps in policy and clarity regarding licensing and permits

Core Story of the System



South Africa has a relatively more advanced GH2 ecosystem (PGM industry for electrolysers and fuel cells) and more GH2 application experiences with the HySA.

Yet, we still have a system that is currently optimized to benefit larger players.

The system excludes smaller players and startups who are faced with limited access to finance for their scale-up activities, limited, affordable skill base, and a risk of exclusion from GH2 projects developed by larger players (lack of collaboration).

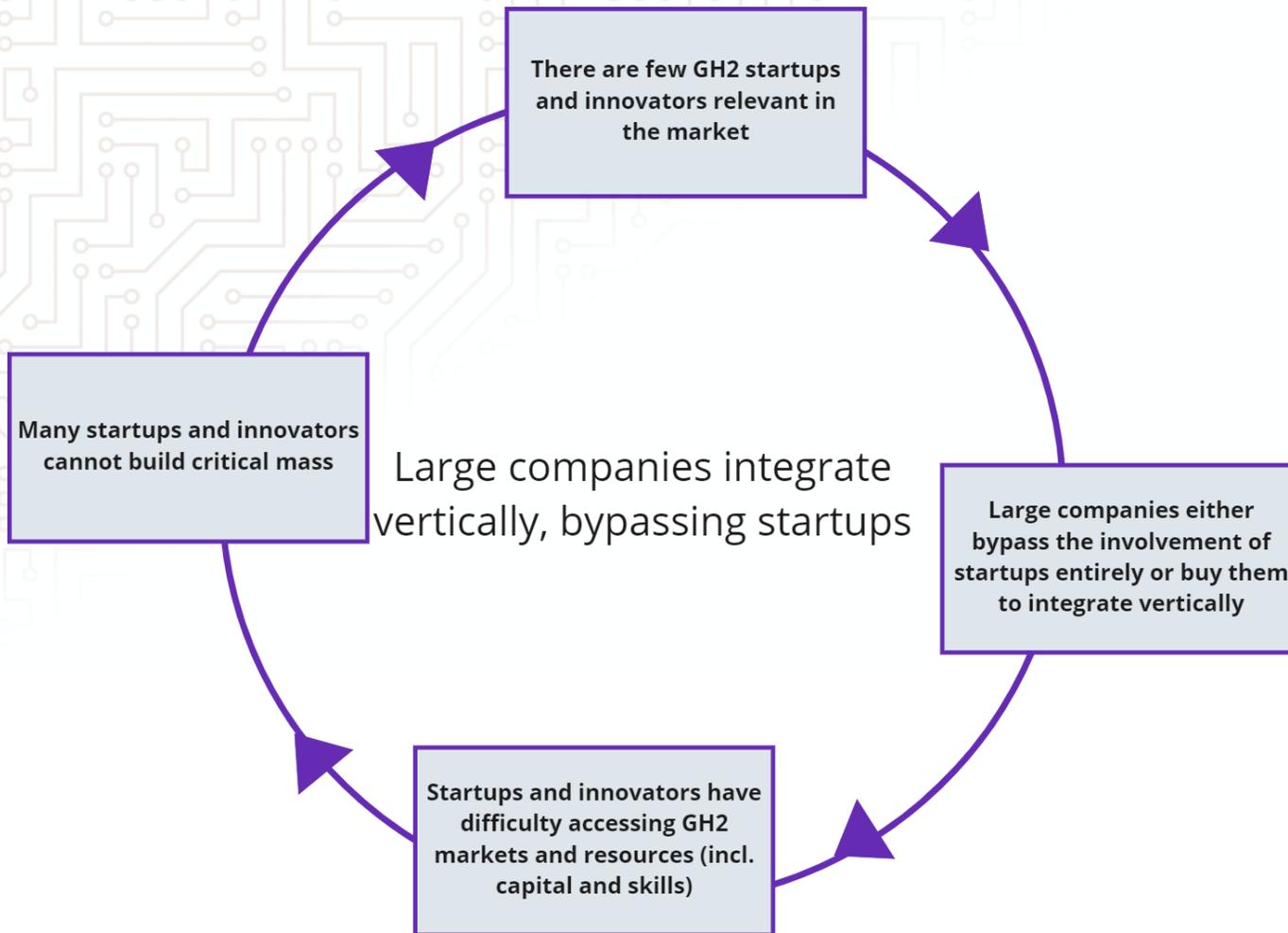
This all severely limits their market access and commercialization.

Loop 1: Skills and Inclusivity



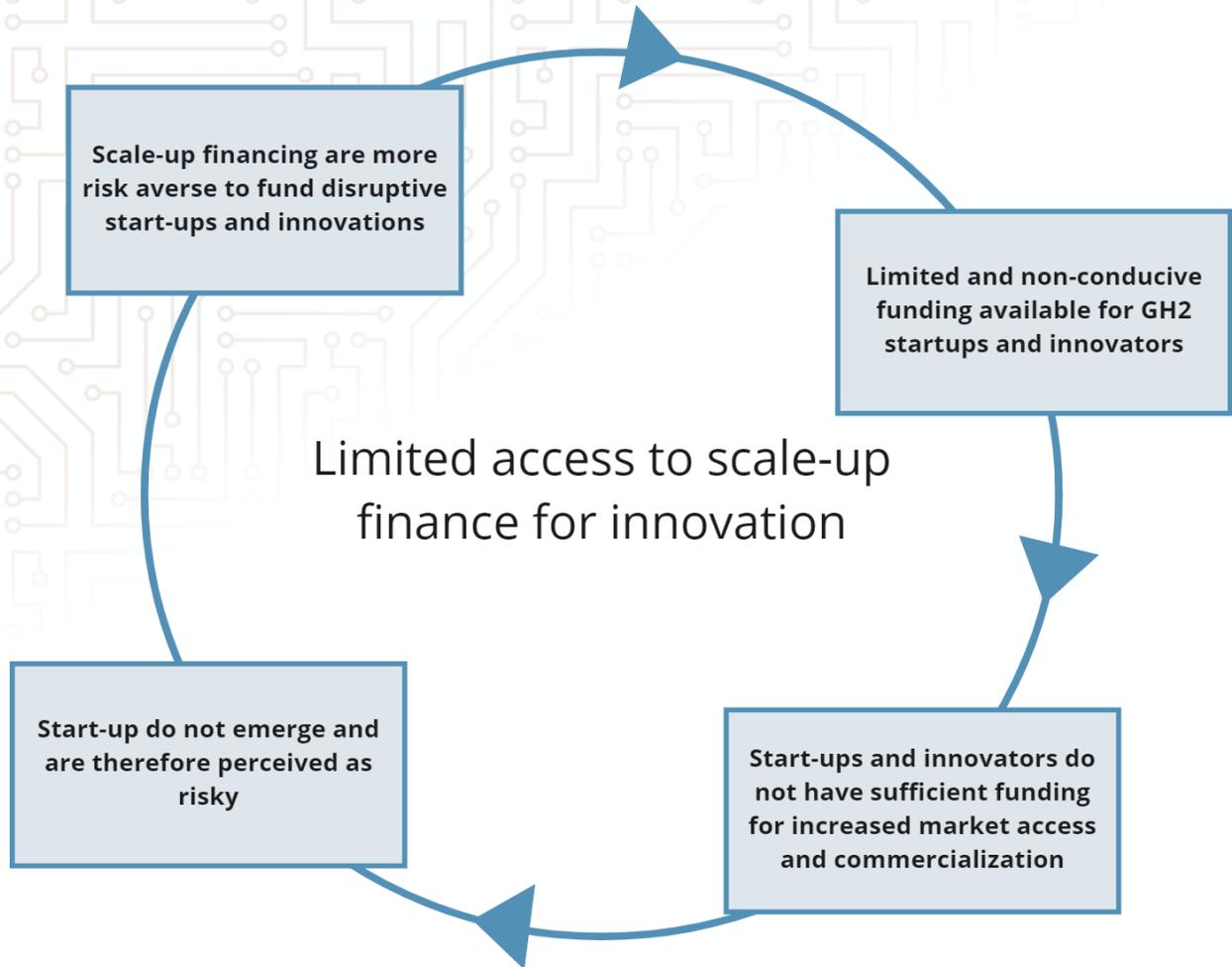
- There are limited GH2-specific skills programs and curricula in the South African ecosystem, thus local graduates and workers aren't fit for industry.
- One effect is that companies hire foreign skilled workers for their GH2 projects.
- This leads to a limited inclusion of local workers and graduates in the GH2 ecosystem, and by extension, the exclusion of local communities from the process.
- When there are fewer opportunities in GH2 for local workers and graduates, there is less incentive to develop local GH2 curricula, which closes the loop and leads to limited GH2-specific skills and trainings in the region.

Loop 2: Vertical Integration



- There are few GH2 startups large and advanced enough to play a role in the market. They are lacking the investment to grow or the certification and track record to become partners of the larger companies.
- Thus, larger companies either don't find these startups (lack of transparency/visibility) and decide to do everything themselves; or they buy their ideas.
- Thus, GH2 startups are not part of the market, thus have difficulties accessing resources like information, capital and skills
- Thus, startups cannot build critical mass to sufficiently advance, grow their innovation and expand their team. Thus, they stay too small to be relevant for the big players.

Loop 3: Access to Finance



- Providers of growth capital are more risk averse to fund disruptive GH2 start-ups and innovations, notwithstanding the presence of TIA – a funder dedicated to innovative start-ups
- This leads to limited suitable funding available for the scale up activities of GH2 startups and innovators
- Thus, start-ups and innovators do not have sufficient funding for increased market access and commercialization
- As a result, start-up do not emerge and are therefore perceived as risky
- This then leads back to the fact that provider of growth capital remain risk averse to fund disruptive start-ups and innovations



Aspirational Future for the Green Hydrogen Sector

The Future We Hope For

Transition for the South African economy, get out of load shedding

H2 to play a vector in **energy transition**

Supply H2

South Africa plays a **major role** in equipment production

Inclusive

Inclusion of people

See more **local** companies getting into the GH2 space and getting **support**

Dream becomes **true**

Create jobs

Embed **production** with **innovation** locations

Build kite ships

Alleviate South Africa's unemployment situation

OUR GUIDING STAR



South Africa's robust and inclusive GH2 sector benefits local communities and encourages the participation of local (digital) startups and innovators.

A **guiding star** is a vision that is framed as the desired future system toward which your team is working.

Establish mechanisms that make startups market-ready and facilitate the collaboration of local (digital) startups and innovators with large GH2 projects and companies across the value chain.



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.

OUR GUIDING QUESTION

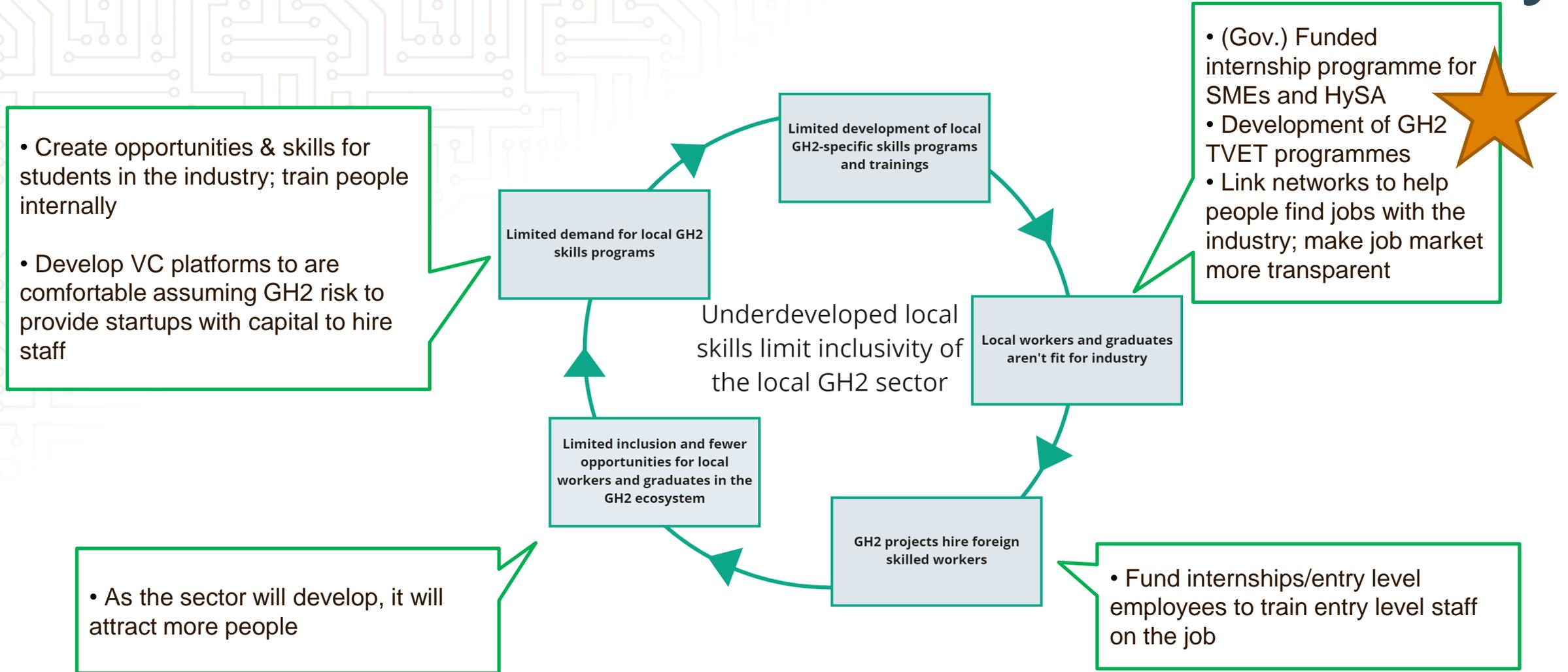
How might we ensure that (digital) startups and local innovators benefit from the potential in the green hydrogen sector?

Levers and Solutions for Change

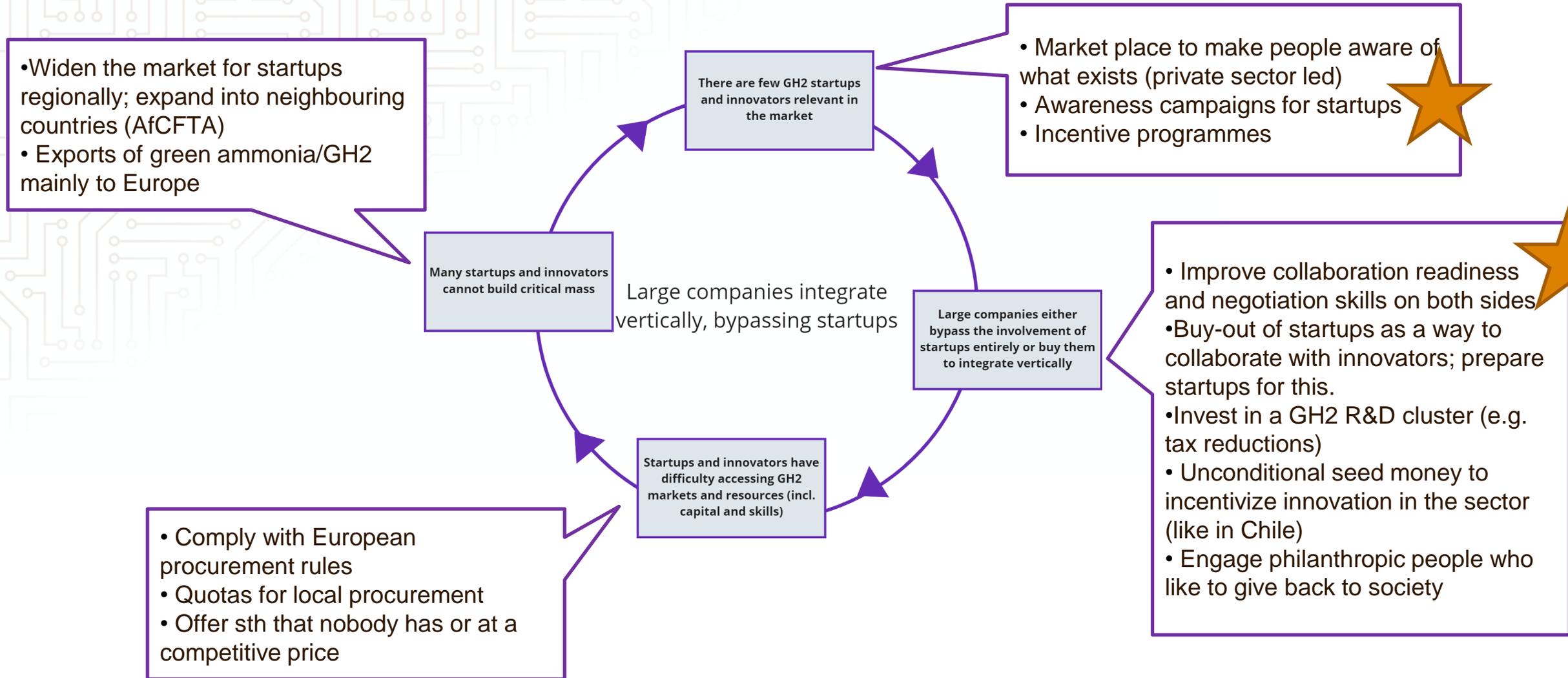


Starts mark the solutions which resonated most with the consultations' participants

Solutions for Skills and Inclusivity



Solutions for Inclusive Value Chain



Solutions for Access to Finance

- 
- Awareness of the different funding lines that TIA has: SME funding, VC funds etc.
 - Government could de-risk some funding; so far the sources are limited
 - A unit to help fund seekers to improve the quality of their applications

- Research can play a role to identify niches for startups
- Linkage between research institutions and startups; they spin off from the research institutions
- Bring other players on board in research and the energy department to make startups better prepared for the market; thus less risky.

Scale-up financing are more risk averse to fund disruptive start-ups and innovations

Start-up do not emerge and are therefore perceived as risky

Limited access to scale-up finance for innovation

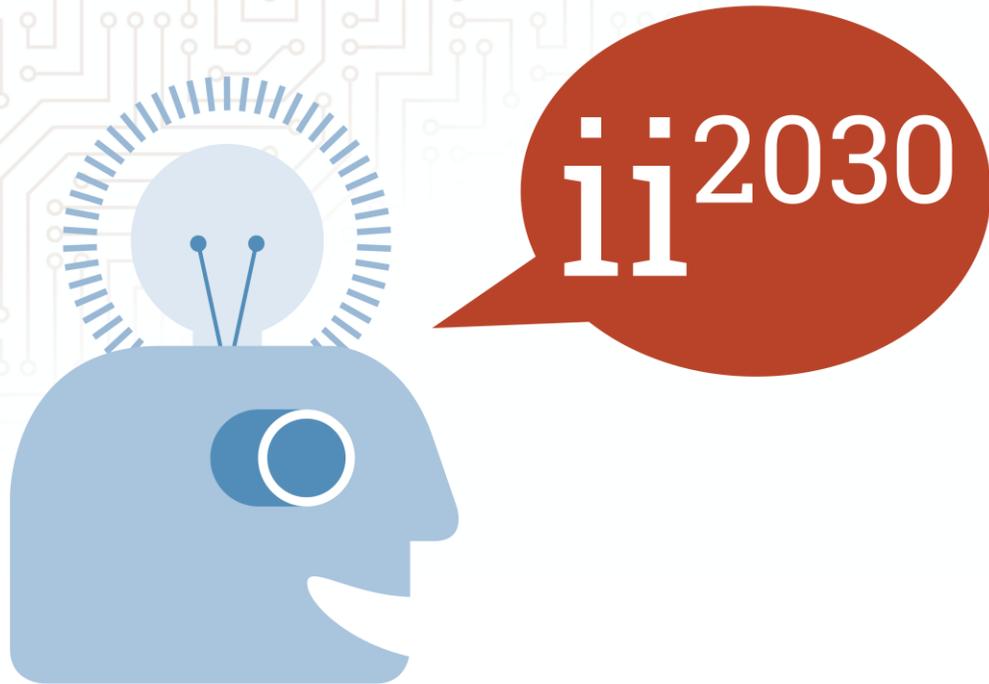
Limited and non-conductive funding available for GH2 startups and innovators

Start-ups and innovators do not have sufficient funding for increased market access and commercialization

- Would be good to have different kinds of tools: Funding for feasibility studies, production cost, technology, securing off-take agreements etc.
- Esp. feasibility studies would help to develop bankable projects.

- Interactive portal and directory to inform the various options and processes involved (based on study GIZ is already doing on financing landscape)
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Thank you for your attention



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