HIGH LEVEL OUTCOMES OF THE HYDROGEN SOCIETY ROADMAP

Presenter: Dr Phil Mjwara
Occasion: Hydrogen Society Roadmap Launch
Date: 17 February 2022
Vision

An inclusive, sustainable and competitive hydrogen economy by 2050 with the goal of achieving a Just and inclusive net zero carbon economic growth for societal wellbeing by 2050.

Purpose

To align stakeholders on a common vision on hydrogen related technologies in order to create an environment where investment decisions can be made to unlock the social economic benefits for the country.
Hydrogen Society Roadmap: Link to other Policies and subcomponents of the Roadmap

Coal CO2 to X Research Development Innovation Programme Roadmap

Green Hydrogen Economy: Just labour transition through TVET College System in SA

Platinum Valley (South Africa’s version of a Hydrogen Valley)

Platinum Valley (Limpopo Science and Technology Park)

Theory of Change Monitoring, Evaluation and Learning Framework

Second Hydrogen South Africa Five Year Review

Completed Dec 2020
To be Completed April 2022
Completed and launched in October 2021
Completed Oct 2021
Completed Sept 2021
Completed Dec 2020
Key Milestones of the Stakeholder Engagement Process

50 stakeholder organisations were consulted during the development of the HSRM through questionnaires and Expert Working Groups.

Collaboration Workshop hosted and attended by close to 100 local and international stakeholders.

Cabinet Approved the HSRM Document on 14 September 2021.


Stakeholder Consultation:

Academia / Councils / R&D

Government / Parastatal

Industry Reference Group

July 2020 to September 2020

July to August 2021

September to October 2021
Decarbonisation of transport sectors: heavy duty trucks, shipping, aviation and rail  
Lead Department: DoT  
Supported by: DFFE, DMRE, DPE

Decarbonisation of energy intensive industry: iron & steel, chemicals, mining, refineries, cement  
Lead Department: DTIC  
Supported by: DFFE

Creation of an export market for green hydrogen and green ammonia  
Lead Department: DTIC  
Supported by: DIRCO, NT

Green and enhanced power sector and buildings  
Lead Department: DMRE  
Supported by: DPWI

Creation of a manufacturing sector for hydrogen products and components  
Lead Department: DSI  
Supported by: DTIC, DMRE, DSBD

Transition from grey to blue to green hydrogen  
Lead Department: Presidency  
Supported by: DSI, DMRE, DTIC, DIRCO, DFFE, DPE, DPWI
Priority Actions based on the High-Level Outcomes of the Hydrogen Society Roadmap

- Decarbonisation of Transport (8)
- Decarbonisation of Energy-Intensive Industry (8)
- Creation of Export Market SA H2 (9)
- Enhanced and Green Power Sector (16)
- Centre of Excellence in Manufacturing (9)
- Hydrogen production, storage, distribution (20)
Decarbonisation of transport
1. Classify hydrogen as a transport fuel
2. Develop regulations, codes, and standards for hydrogen refueling
3. Develop regulatory framework to support zero emission transport across road, rail, shipping
4. Implement refuelling station pilots for buses, heavy goods vehicles and taxis

Decarbonisation of Energy Intensive Industry
1. Align Steel Masterplan to the hydrogen Society Roadmap
2. Conduct feasibility studies on developing H2 industrial hubs at ports that link with shipping, truck and aviation routes.
3. Develop policies and regulations that will stimulate demand for H2-related applications in mining, cement, steel & refineries.

Creation of an Export Market for green H2
1. Conduct market analysis identifying the export opportunities, obstacles and gaps, as well as potential partners and investors.
2. Put in place international partnerships with key countries willing to purchase GH2.
3. Develop a hydrogen export strategy.

H2 = Hydrogen
GH2 = Green Hydrogen
Green and Enhanced Power Sector
1. Pilot fuel cells in data centres for proof of concept.
3. Update NDCs to align with HSRM with a specific focus on the power generation sector.

Centre of Excellence in Manufacturing
1. Finalise Minerals Beneficiation Masterplan.
2. Develop a GH2 product and component manufacturing strategy aligned with the Automotive Masterplan & Minerals Beneficiation Masterplan.
3. Develop and implement RDI strategy to support H2 product and component manufacture.

Transition from grey to blue to green Hydrogen
1. Finalise Green Hydrogen Commercialisation Strategy to support the implementation of the HSRM
2. Implement catalytic projects such as Boegoebaai SEZ, Platinum Valley, Initiative, CoalCO2-X Demonstration and SAF project

GH2 = Green Hydrogen
HSRM = Hydrogen Society Roadmap
NDCs = Nationally Determined Contributions
SEZ = Special Economic Zone
SAF = Sustainable Aviation Fuels
The International Energy Agency (IEA) Policy Framework

The IEA has proposed five pillars of policy support to promote domestic use and create export opportunities via the establishment of new global markets for carbon-neutral commodities:

- **Establish targets and / or long-term policy signals**
  - A national hydrogen strategy should clearly define the role of hydrogen in the economy, identify priority sectors, either domestic or export, and a timeframe for scaling deployment.

- **Support demand creation**
  - Industrial and transport applications (such as iron and steel, long-haul heavy-duty transport, industrial heat, chemicals and syngas) are ideal catalysts to stimulate demand for hydrogen-related technologies.

- **Mitigate investment risks**
  - Investment certainty is required to leverage identified opportunities.

- **Promote RDI, strategic demonstration projects and knowledge-sharing**
  - To achieve a cost-competitive hydrogen value chain, continued investment in RDI is required to support large-scale demonstration projects and get stakeholder buy-in.

- **Harmonise standards and remove barriers**
  - Appropriate standards and regulations need to be developed to govern the production, processing and application of hydrogen.
Priority Actions based on the IEA Framework

1. Establish targets or long-term policy signals
2. Harmonise standards and remove barriers
3. Mitigate investment risks
4. Promote Research Development and Innovation
5. Implement Strategic Demonstration and Deployment Projects
6. Support demand creation
7. Support Skills development public awareness

70 KEY ACTIONS
IEA Framework Based Priority Actions for RDI, Strategic Demonstration Projects and Skills Development

### Promote RDI
1. Develop RDI strategy to support HSRM
2. Establish Solar Research Facility
3. Invest in RDI focused on the most efficient generation, storage and shipping methods to make South African GH2 cost competitive.
4. Develop and implement RDI strategy to support H2 product and component manufacture.

### Implement Strategic Demonstration Projects
1. Gazette H2 Strategic Integrated Infrastructure Project
2. Implement the Platinum Valley initiative
3. Implement the Boegoebaa SEZ
4. Implement CoalCO2-X demonstration project
5. Implement SAF project.

### Skills Development & Public Awareness
1. Develop skills roadmap to support the implementation of the HSRM.
2. Create awareness of hydrogen economy through different building-related bodies around H2 and HFCT in buildings.
3. Create a marketing and advocacy plan for hydrogen use in the electricity sector (main, micro-grid).

GH2 = Green Hydrogen
H2 = Hydrogen
HFCT = Hydrogen and fuel cell technologies
RDI = Research, Development and Innovation
SAF = Sustainable Aviation Fuels
SEZ = Special Economic Zone
The UNIDO Report of February 2021 identifies some of the barriers to the empowerment of women in the Green Industry:

Source: UNIDO Report, February 2021

The HSRM recognizes the importance of GESI in the transition to a low carbon economy. In this regard, focus will be placed on:

- Proposed targets for participation of women and youth in the green hydrogen value chains
- Skills development and awareness campaigns targeted at women and the youth
- Recruitment of women and youth in the RDI initiatives aimed at supporting the implementation of the HSRM.
South Africa should leverage the Hydrogen opportunity as part of its Economic Reconstruction and Economic Recovery Plan.

Rebrand South Africa as a destination for Sustainable Investment that incorporates environmental, societal and good governance (ESG) principles.

Ensure that Gender, Equality and Social Inclusion are at the core of the transition to a low carbon economy to tackle the triple challenges of poverty, inequality and unemployment.

Build stronger partnerships between government, private sector and civil society by putting in place an enabling policy environment as quickly as possible.

Build upon the momentum created by the Hydrogen South Africa Programme to position SA as a global player in the green hydrogen and green ammonia markets.

International partnerships are key to the realisation of the Hydrogen Economy. However, we need to ensure that our national interests are clearly articulated and protected.
Ro livhuwa
Siyabonga
Re a leboga
Ha khensa
Siyathokoza
Enkosi
Dankie
Thank you