

International Partnership for Hydrogen and Fuel Cells in the Economy

Country Update: South Africa

Policy framework

- **Department of Science and Technology**-RDI policy for new technology development
- **Department of Energy**-Integrated Resource Plan (IRP), Deployment incentives, Target-42% of new generation capacity by 2030 to be RE
- **Department of Trade and Industry**-Industrial Policy, Special Economic Zones (SEZ) and incentives for green technology industries e.g. HFC
- **Department of Mineral Resources**-Extraction of Minerals, Minerals Beneficiation Strategy
- **National Treasury**-Fiscal Reform and Funding for Cabinet approved programmes e.g. HySA
- **Department of Environmental Affairs**-Climate Change Policy with emission targets
- **Department of Rural Development and Land Reform**-identification of priority areas for FC deployment

Departments constitute the Fuel Cell Solutions Task Team where industry can also participate.

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Funding schemes

- RDI funding administered by the Department of Science and Technology

Funding volumes

- Bulk of the current funding is from government (>90%)~USD 55 million to date
- Annual budget around USD 7.5 million
- Industry co-funds specific projects based on their interest


Road map

- HySA-15 year Research, Development & Innovation (RDI) Programme
- 2008-2013: Establishment of R&D capability and basic infrastructure, Five Year Review conducted in Feb-March 2014
- 2013-2018: Extension of technology development through strategic partnerships
- 2018-2023: Commercialisation incorporating South African innovation to build industry cluster

South Africa to become a key global player in HFC technologies based on SA natural resources

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Country Update South Africa RDI Activities

Current H2FC projects / activities

- HT Membrane Electrode Assembly- pilot scale manufacturing
- Metal Hydride Storage material – pilot scale manufacturing
- Electrochemical hydrogen compression-USD400k funding received from Anglo Platinum for 3 yrs
- Catalyst Development-validation of performance underway with external partners
- Portable power
- Hydrogen fuelled vehicles
- Hydrogen infrastructure (storage, delivery etc)
- Renewable hydrogen production-Solar to hydrogen pilot plant
- Public awareness and development platform disseminating information through various media
- Hydrogen Summit held in February in Johannesburg with active participation from industry
- Safety, codes and standards-discussion initiated with SABS, active interaction planned with RCS WG

Future / planned H2FC projects: targets

- Combined heat and power (CHP)-deployment of unit in informal settlement in early 2015
- CHP units for residential & commercial buildings to reduce reliance on the grid
- Identify more opportunities for FC application in Mining Industry e.g. to reduce ventilation costs
- Large scale demonstration projects to stimulate H₂ infrastructure development e.g. H₂ buses.

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Country Update: South Africa Market preparation

Early markets: transportation and stationary

- Transportation –leisure market, technology demonstrated in golf carts, fork lifts and electric scooters focusing on range extension
- Stationary-telecoms back up power (replacement of diesel generators)

Deployment

- ±200 units deployed in the telecoms sector for back up power-mostly ethanol based
- Challenge: hydrogen distribution logistics
- Market estimated at 15 000 -20 000 base stations
- Deployment of FC units in rural schools and clinics
- FC deployment in the Mining industry –FC locomotive at Anglo Platinum, Fork lift for Impala Platinum
- Collaboration with Anglo American Platinum/Ballard and Government on rural electrification

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Strategic Partnerships

International	<ul style="list-style-type: none"> ▶ Coventry University ▶ ZSW ▶ IFE 	<ul style="list-style-type: none"> ▶ MicroCab Industries ▶ Fumatech ▶ Hystorsys ▶ Powercell SE
	<ul style="list-style-type: none"> ▶ Anglo Platinum ▶ Impala Platinum ▶ Hot Platinum ▶ TF Design ▶ PetroSA 	<ul style="list-style-type: none"> ▶ Melex electro vehicles ▶ Anglo Platinum ▶ Clean Energy Investments

R&D **Commercialisation**

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Power-to-Gas (PtG)

- Included in the HySA contribution to the IRP
- Newly launched project at HySA Infrastructure
- Electrolyser system development
- Integration with renewable plants in the Northern Cape
- Use renewable energy to generate hydrogen e.g. Wind and Solar
- Electrochemical compression of hydrogen
- Hydrogen storage and delivery
- PtG could become significant following shale gas exploitation in the Karoo.

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Benefits of developing H₂ Infrastructure in SA

- Means of meeting increasing energy demand
- Reduction of the carbon footprint in a heavily carbonised energy mix
- Potential to become an integral part of the Energy storage roadmap
- Platform for mineral beneficiation
- Opportunity for job creation through value added manufacturing
- Export opportunities
- Increase demand for platinum group metals
- Opportunities for regional cooperation within the SADC region

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