



INTERNATIONAL PARTNERSHIP FOR HYDROGEN AND FUEL CELLS IN THE ECONOMY

IPHE Country Update December 2015: South Africa

The IPHE Secretariat requests each IPHE member submit a one-page narrative update on hydrogen and fuel cell (HFC) activities. Please only report actions and developments since the last Country Update and leave Sections blank if there have been no new developments.

Name	Cosmas Chiteme
Contact Information	Cosmas.Chiteme@dst.gov.za
Covered Period	June –November 2015

1. New Policy Initiatives on Hydrogen and Fuel Cell

Hydrogen and fuel cells is one of the initiatives that have been identified through a multi-stakeholder planning process, set up by the President to look at interventions that are necessary to stimulate demand and to advance beneficiation of key South African minerals. The stakeholders included relevant government departments, mining industry, labour and development finance institutions. The discussions will look at the current suite of incentives and how they can be used to support the creation of a viable fuel cell industry.

2. Hydrogen and Fuel Cell R&D Update

The South African Bureau of Standards (SABS) has developed a set of standards for hydrogen and fuel cells. The HySA Centres of Competence have each progressed well in technology development through the development of specific components like platinum based catalysts, metal hydrides and membrane electrode assembly. Going forward, the Centres will focus on technology integration, testing and demonstration as part of other government funded initiatives and working with strategic partners to facilitate the commercialisation of the technologies.

3. Demonstration and Deployments Update

Through public private partnerships, the Department of Science and Technology facilitated the deployment of three 5kW hydrogen fuel cell units at three schools in the Cofimvaba district in Eastern Cape, which were launched by the Minister in June 2015 and another 5kW hydrogen fuel cell back up power unit at a clinic in Windsor East, Johannesburg. Apart from providing energy access in support of the provision of education and health, the deployment of the technology lays the foundation for the growth of a new industry based on South Africa's platinum resource. The City of Johannesburg has requested for more deployments, especially for the new facilities that will be built. The Department, Air Products and Clean Energy Investments committed to further collaboration and deployments.

4. Events and Solicitations

The Minister of Science and Technology was one of the several Ministers who accompanied the Deputy President on his visit to Japan in August 2015. Minister Naledi Pandor delivered the keynote address during the Japan - South Africa Hydrogen and Fuel Cell Symposium, which was also attended by the HySA Directors and officials from the departments of Energy as well as Trade and Industry.



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HySA Infrastructure hosted the Researcher Links bilateral workshop in Pretoria, South Africa from 01 to 04 September 2015, with participants from SA and UK. The workshop was supported by the Newton Fund and co-funded by the British Council and the Royal Society of Chemistry. The focus of the workshop was on hydrogen storage materials with the emphasis on the design, synthesis and characterisation of porous materials.

The inaugural HySA Technical Meeting was held in Cape Town on 17 and 18 August 2015. The meeting brought together stakeholders in the hydrogen and fuel cell technologies (HFCT) sector, with the aim of strengthening the public-private partnerships (PPPs) within the HySA Programme.

The Department of Science and Technology hosted the SA-USA Energy Storage workshop in kwaMaritane, North West Province, under the SA-USA bilateral agreement. The meeting brought together experts in energy storage, focusing on Lithium Ion batteries and batteries for utility scale storage.

5. Investments: Government and Collaborative Hydrogen and Fuel Cell Funding

The HySA Programme received funding of R80 million (~USD 7 million) from the government through the Department of Science and Technology. In-kind support has been received from the Private Sector.



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Summary Country Update December 2015: South Africa

Transportation	Target Number	Current Status	Partnerships, Strategic Approach	Policy Support
Fuel Cell Vehicles ¹	N/A by 2020	None as of 20/11/2015		
FC Bus	N/A by 2020	None as of 20/11/2015		
Fuel Cell Trucks ²	N/A by 2020	None as of 20/11/2015		
Forklifts	No target	1 forklift as of 20/11/2015	One demonstrator to be launched at a refinery	
H ₂ Refueling Stations	Target Number	Current Status	Partnerships, Strategic Approach	Policy Support
70 MPa On-Site Production	No target	None as of 20/11/2015		
70 MPa Delivered	No target by 2020	None as of 20/11/2015		
35 MPa On-Site Production	No target as of 20/11/2015	None as of 20/11/2015		
35 MPa Delivered	No target	None as of 20/11/2015		

¹ Includes Fuel Cell Electric Vehicles with Range Extenders

²As above



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Stationary	Target Number ³	Current Status	Partnerships, Strategic Approach	Policy Support
Small ⁴	No target by 2020	None	None	• None
Medium ⁵	No target by 2020	4 x 5kW units installed	Government, Anglo Platinum, Air Products, Clean Energy Investments	
Large ⁶	No target	None		
District Grid ⁷	No target	None		• None
Regional Grid ⁸	No target	None		
Telecom backup	No target	~2MW		
H ₂ Production	Target ⁹	Current Status	Partnerships, Strategic Approach	Policy Support
Fossil Fuels ¹⁰	No target, CO ₂ -free H ₂ by 2020	N/A		
Water Electrolysis ¹¹ (PEM, Alkaline,	No target by 2020	N/A		

³ Targets can be units installed and/or total installed capacity in the size range indicated

⁴ <5 kW (e.g., Residential Use)

⁵ 5kW – 400 kW (e.g., Distributed Residential Use)

⁶ 0.3MW – 10 MW (e.g., Industrial Use)

⁷ 1MW – 30 MW (e.g., Grid Stability, Ancillary Services)

⁸ 30MW plus (e.g., Grid Storage and Systems Management)

⁹ Target can be by quantity (Nm³, kg, t) and by percentage of total production; also, reference to efficiency capabilities can be a target

¹⁰ Hydrogen produced by reforming processes

¹¹ Please indicate if targets relate to a specific technology (PEM, Alkaline, SOEC)



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SOEC)				
By-product H ₂	None	N/A		
Energy Storage from Renewables	Target¹²	Current Status	Partnership, Strategic Approach	Policy Support
Power to Power ¹³ Capacity	None	N/A	Discussions have been initiated	
Power to Gas ¹⁴ Capacity	None	N/A	Discussions have been initiated	

¹² Can be expressed in MW of Installed Capacity to use the electricity from renewable energy generation, and Annual MWh of stored energy capacity

¹³ Operator has an obligation to return the electricity stored through the use of hydrogen back to electricity

¹⁴ Operator has the opportunity to provide the stored energy in the form of hydrogen back to the energy system through multiple channels (e.g., merchant product, enriched natural gas, synthetic methane for transportation, heating, electricity)