

HySA Infrastructure Center of Competence: A Strategic Collaboration Platform for Renewable Hydrogen Production and Storage for Fuel Cell Telecom Applications

Dmitri Bessarabov, Gerhard Human, Steven Chiuta, Frik Van Niekerk, Deon De Beer, Hannes Malan, LJ Grobler

HySA Infrastructure Centre of Competence, Faculty of Engineering, North-West University (NWU), P. Bag X6001, Potchefstroom 2520, South Africa

Henrietta Langmi, Brian North, Delon Mudaly, Mkhulu Mathe

HySA Infrastructure Centre of Competence, Materials Science and Manufacturing, Council for Scientific and Industrial Research (CSIR), PO Box 395, Pretoria 0001, South Africa
dmitri.bessarabov@nwu.ac.za

Abstract

The Department of Science and Technology of South Africa developed the National Hydrogen and Fuel Cells Technologies (HFCT) Research, Development and Innovation Strategy. The National Strategy was branded Hydrogen South Africa (HySA). HySA has been established consisting of three Competency Centres – HySA Infrastructure, HySA Catalyst and HySA Systems. The scope of the Hydrogen Infrastructure Competency Centre (HySA Infrastructure CoC, is to develop applications and solutions for small- and medium-scale hydrogen production and storage through innovative research and development. The aim of this paper is to present an overview of the HySA Infrastructure CoC projects related to renewable hydrogen and fuel cell applications. The presentation will discuss how the HySA Infrastructure could assist telecommunication industry with providing a potential strategic platform for developing and testing various hydrogen generating solutions for fuel cell applications specific to African conditions. More specifically, the following enablers will be discussed: existing active projects for hydrogen production: solar-to-hydrogen demonstrations based on PEM electrolysis, ammonia-to-hydrogen projects for telecom, advanced PEM electrolysis concepts (high-current density operation), hydrogen storage, safety and codes, as well as close proximity of HySA Infrastructure to Gauteng, an economical hub of South Africa, commercialization road map, activities towards establishing “Platinum Valley” SEZ (special economic zone for Pt-related activities).