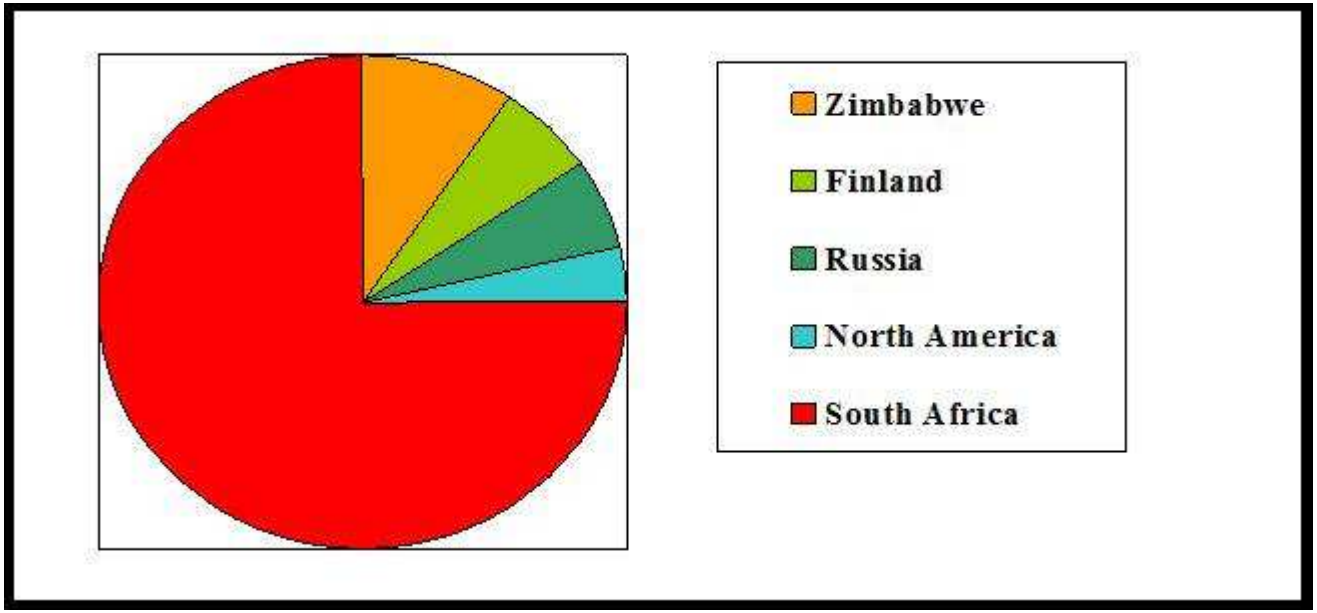
Hydrogen & Fuel Cell Related Activities in SA

Presenter: C Chiteme
Occasion: IPHE-SC Meeting
London
Date: 22-24 May 2013

science & technology
Department:
Science and Technology
REPUBLIC OF SOUTH AFRICA

Why Hydrogen South Africa

World Platinum Reserves: Cawthorn, 1999



Our Hydrogen Vision

“ to create knowledge and human resource capacity that will develop high value commercial activities in hydrogen and fuel cell technologies utilising local resources and existing know-how”

Mission and Overall Objective

15year R&D Programme geared towards *transition from Resource to Knowledge Economy & Clean Energy Technology*

Mission

- Create a South African IPR portfolio around HFC
- Demonstrators and Prototypes
- Pilot-scale manufacturing facilities
- Product development for short/long term markets
- Support for value-added jobs and businesses
- Human capital development ➔ create jobs locally
- Implement a HFC Supply Chain in South Africa (SA)
- Centre of Excellence for Hydrogen & Fuel Cells

Overall Objective

- **Value added manufacturing for PGM catalysis value chain with the aim to acquire 25% global market share by 2020**

National Investments

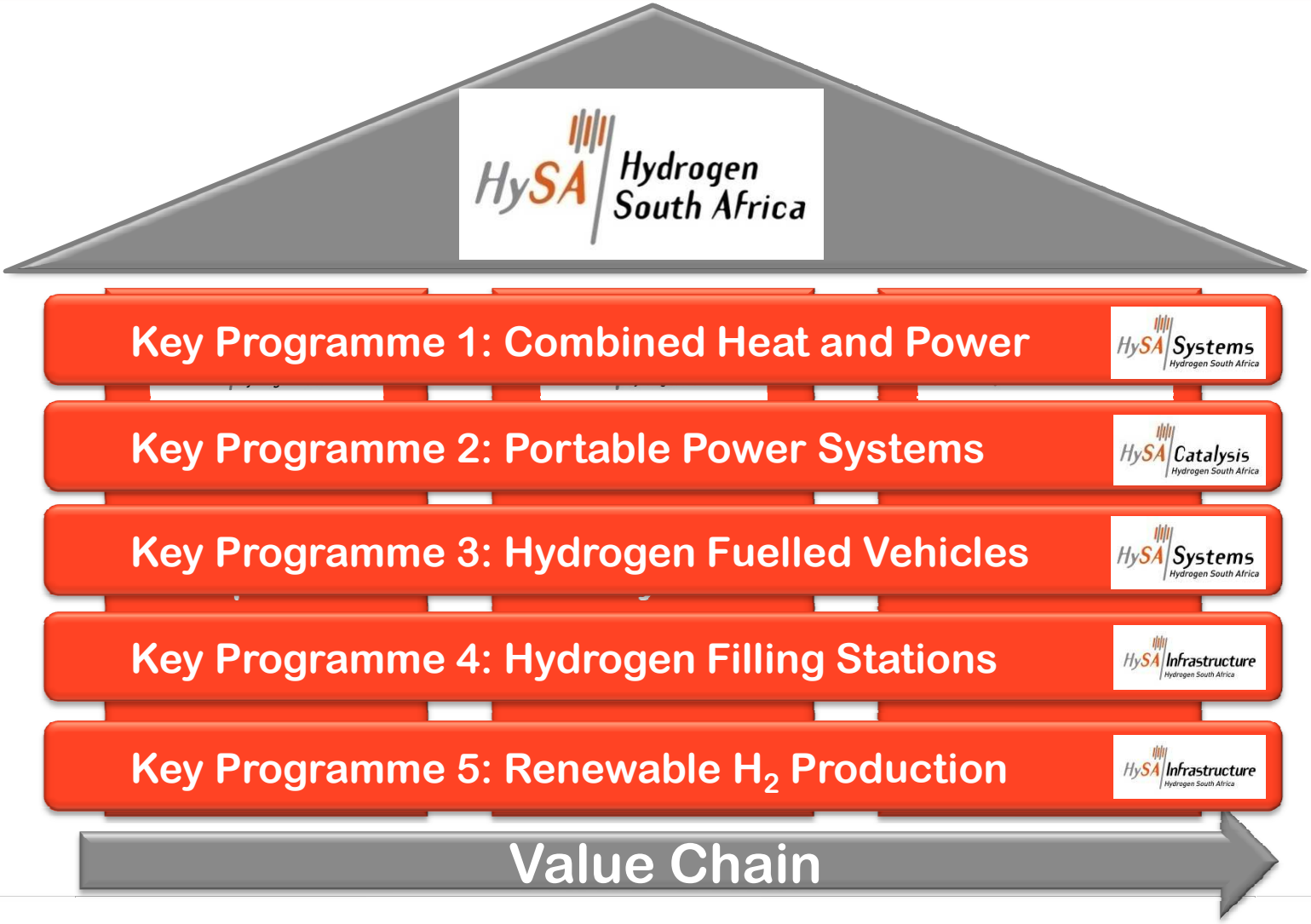
Budgets

- Govt has spent about ZAR450 million since inception of Programme
- Current budget for the 2013-14 FY is ZAR74.8 million
- HySA Public Awareness, Demonstration and Education Platform: ZAR 1.8 million

Other Government Initiatives

- Department of Trade and Industry creating Special Economic Zones to encourage deployment of HFCT
- Platinum Valley Special Economic Zone Steering Committee created to include all relevant government departments
- Fuel Cell Solutions Task Team to evaluate HFCT initiatives
- Department of Energy (DoE) policy encouraging Renewable Energy deployment
- Lobbying for the inclusion of HFCT in the DoE's Integrated Resource Plan
- Department of Environmental Affairs: National Climate Change Response Policy

HySA R&D Programmes

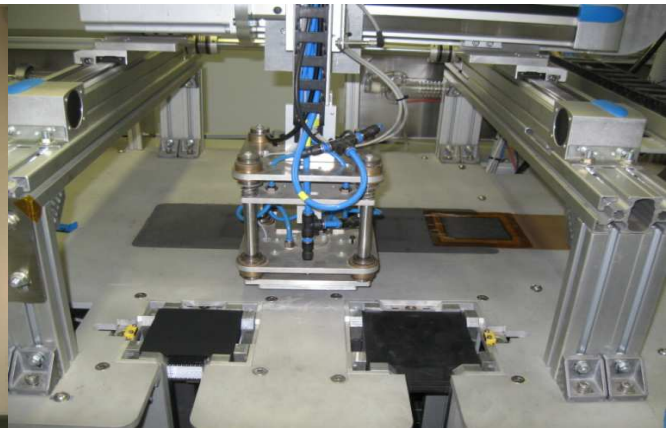


Highlights of the first 5 years (2008-2012)

- Establishment of competency in hydrogen & fuel cell technologies
- Manufacture of 2 kW HT-PEMFC Combined Heat & Power unit for Domestic Applications
- Manufacture of 2.5 kW Fuel Cell backup power system prototype for the Telecommunication & UPS Markets
- Manufacture of the fuel cell electrodes (HT MEA) together with a local Engineering company & a renowned key International Partner
- A metal hydride hydrogen storage unit fuel cell based system for a forklift truck
- First internationally competitive fuel cell catalyst at commercially relevant scale (for LT-PEM applications)
- Local Industry participation through:
  - **R&D co-funding: Anglo Platinum (ZAR 2 million), Petro SA (ZAR 10 million)**
  - **Joint creatorship of IP: Impala Platinum (ZAR 6 million)**
- Human Capital development through postgraduate training
- Infrastructure Investments and Laboratory Fitment
- HySA Advisory Board inaugurated in February 2013.

Technology Demonstration

PEM fuel stack (HT) and Bipolar Plates



MEA manufacturing line

Fuel cell powered tricycle

Fuel cell powered forklift

Fuel cell Golf Cart