



... TOWARDS THE HYDROGEN ECONOMY: A SOUTH AFRICAN PERSPECTIVE

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Department of Science & Technology

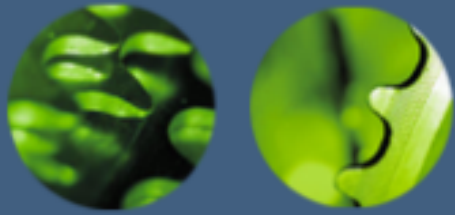
II International Conference

Hydrogen Storage Technologies



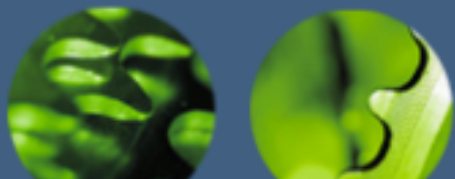
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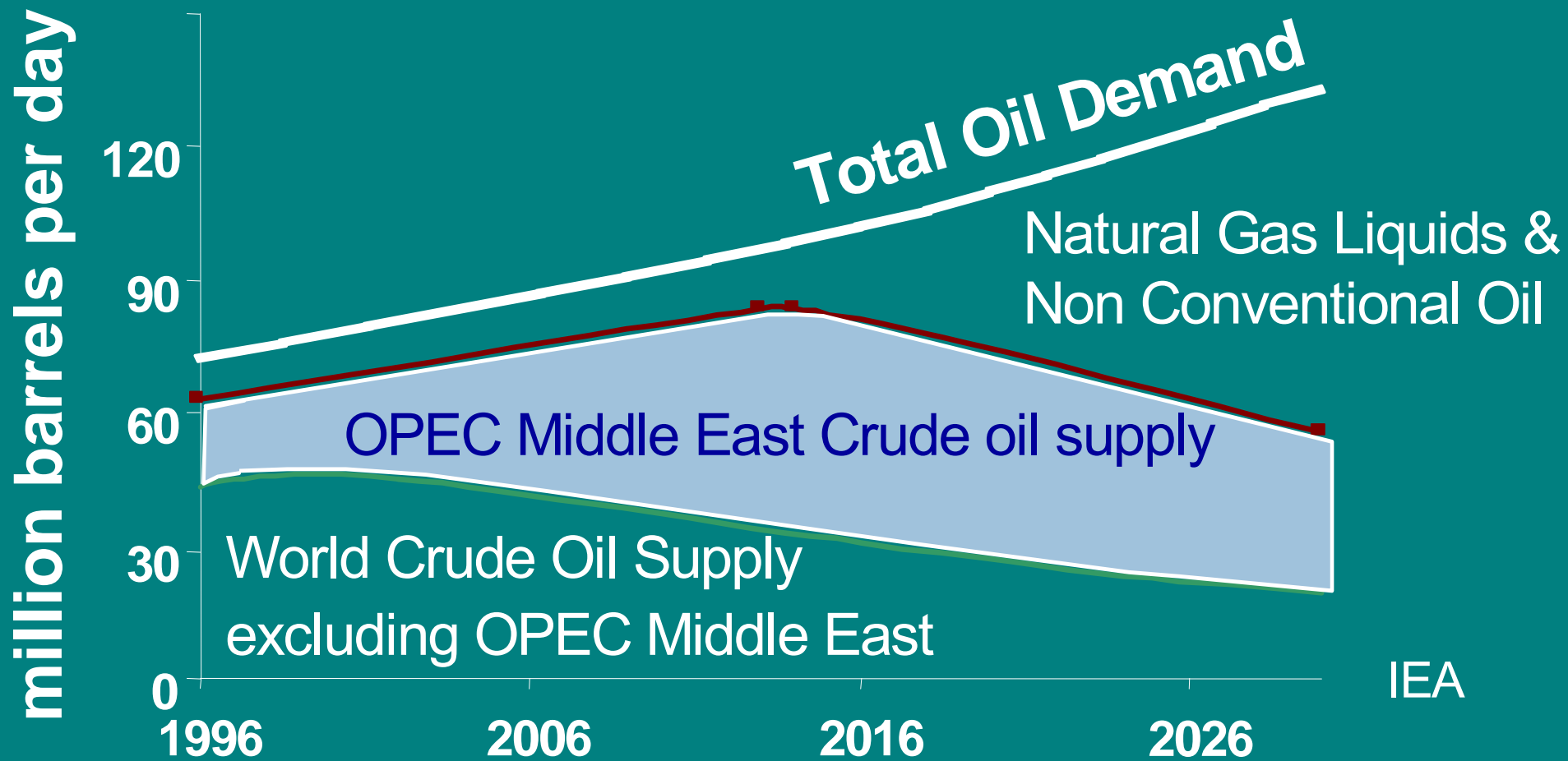


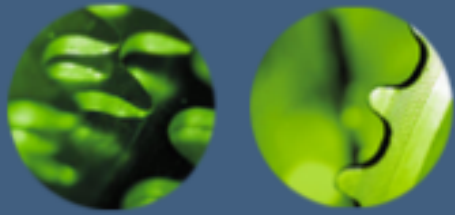
...Presentation Outline

- Why is South Africa talking Hydrogen?
- Global drivers
- South African perspective
- Government Initiatives
- Implementation Plan



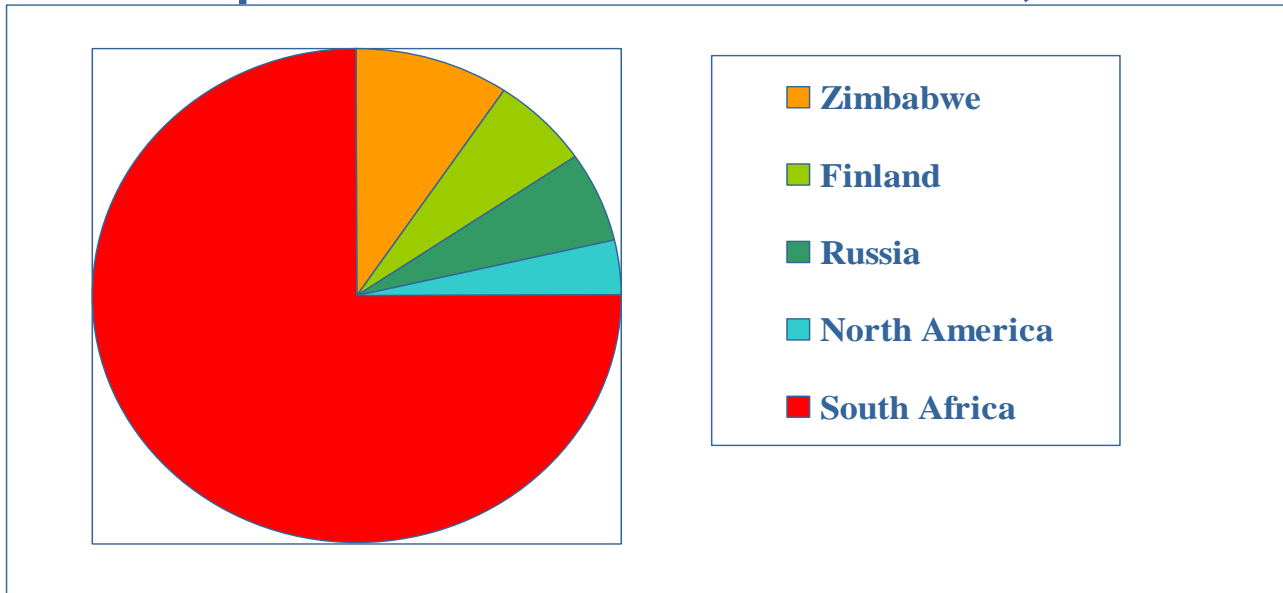
...Global Drivers



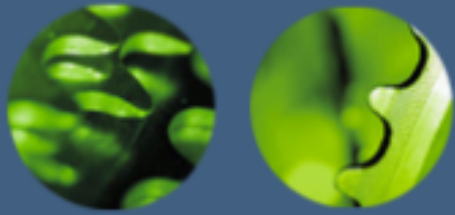


...South African Perspective

World platinum resources: Cawthorn, 1999

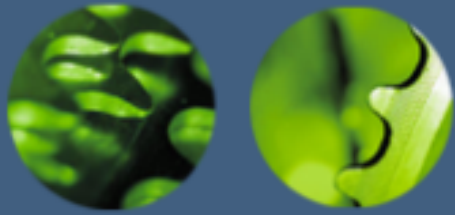


- Fuel cells catalytic properties, substitutions investigated, platinum still shows superior properties
- Current investment in various applications R&D \square US\$1b annually (outside of SA)



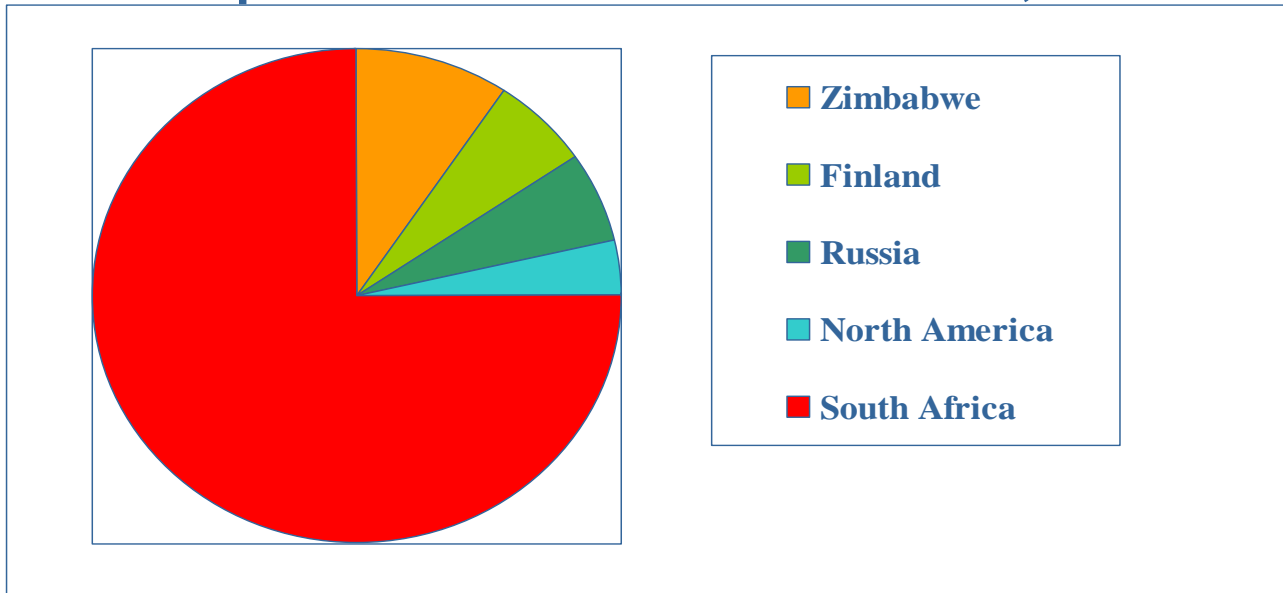
Government Initiatives

- Provides policy leadership in the development of a diversified, sustainable and innovative energy sector in South Africa
- Minerals beneficiation
- Development of the National Hydrogen and Fuel Cell Technologies Research Development and Innovation Strategy – HySA, Hydrogen South Africa

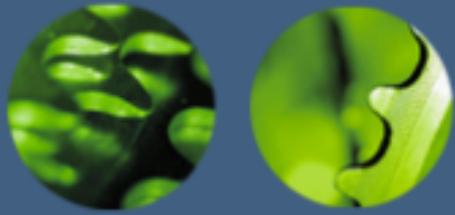


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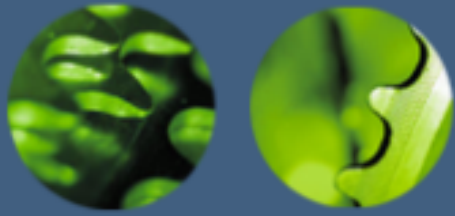


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...Additional Pt resources likely

- Old data was based on 1.2km max depth
- Northam Platinum already mine at 2+km
- Bushveld drilled down to 3.3km
- Gold Mines in SA operate at ~4km already
- Some estimates* say 64000 tonnes Pt in SA



...Pt in a car today vs. fuel cell car



Car today : 2 – 5g Pt

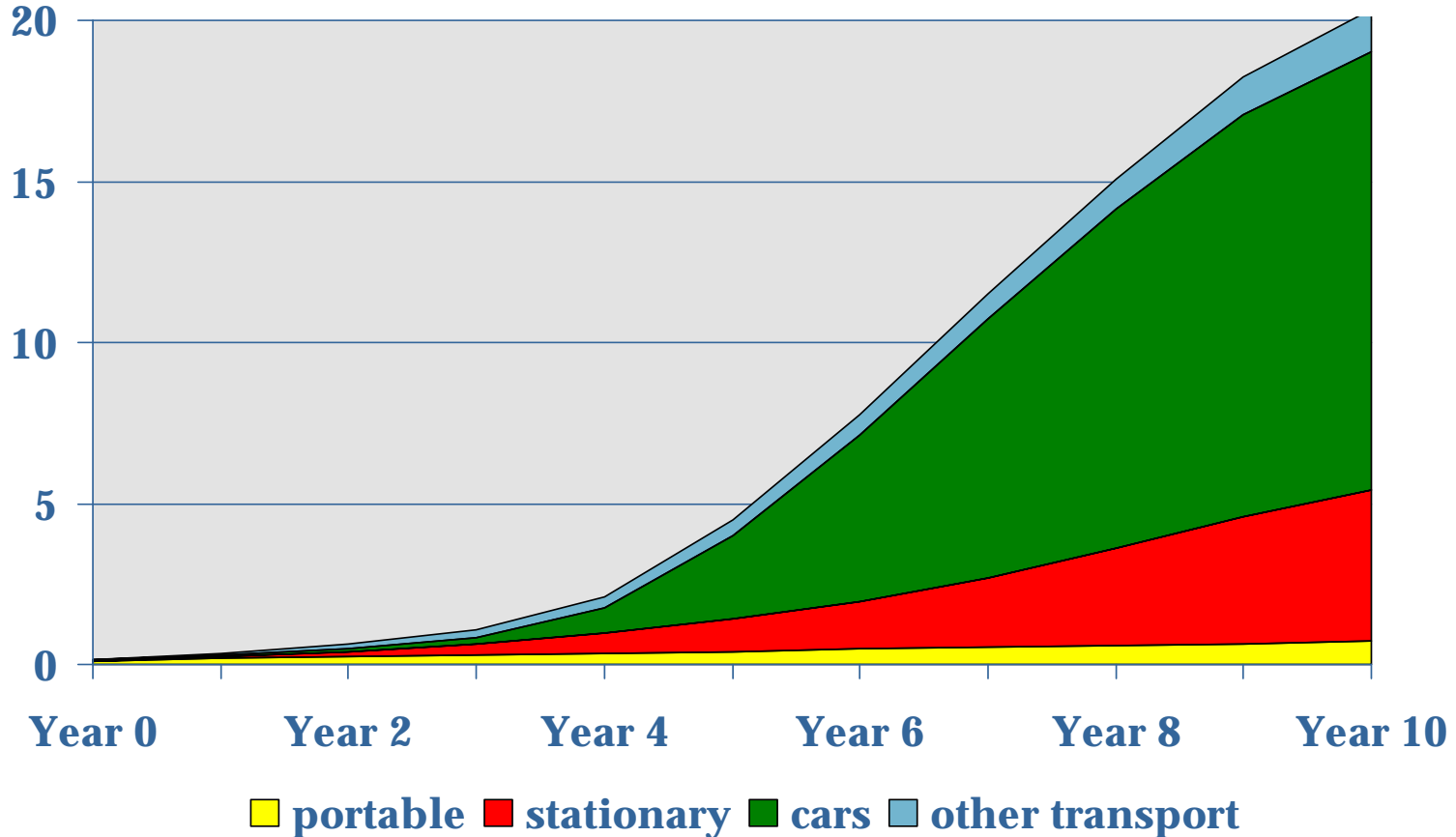
Fuel cell car : 60g Pt

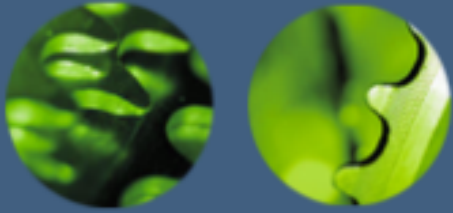


...Pt demand for Fuel cell applications

(Data from Johnson Matthey, 1995-2005)

tonnes





Our Hydrogen Vision

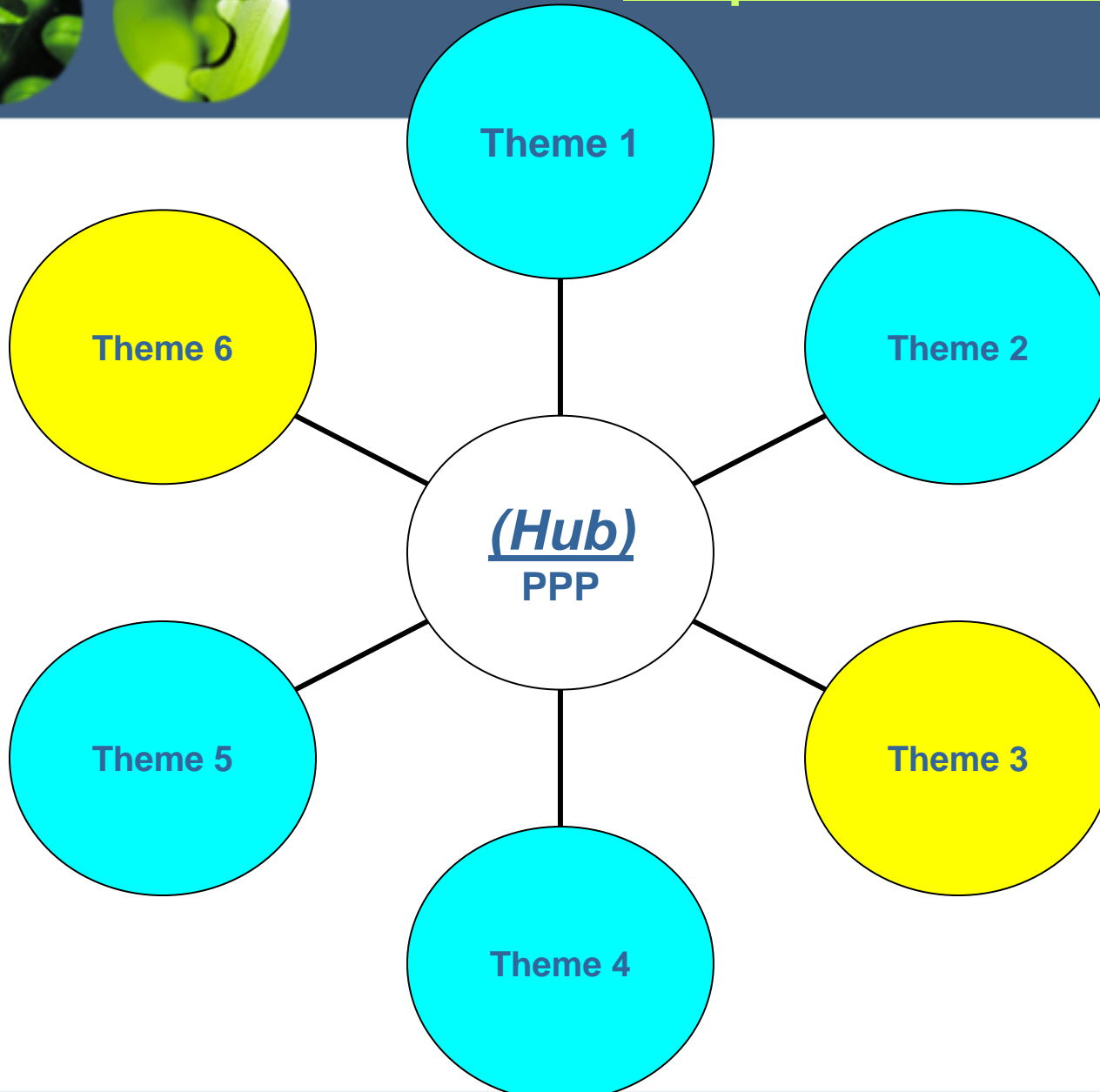
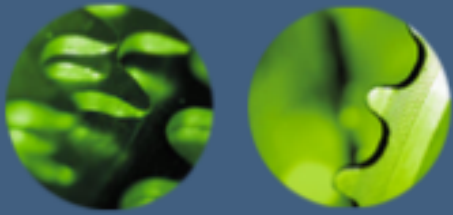
“ to create knowledge and human resource capacity that will develop high value commercial activities in hydrogen and fuel cell technologies utilising local resources and existing know-how”



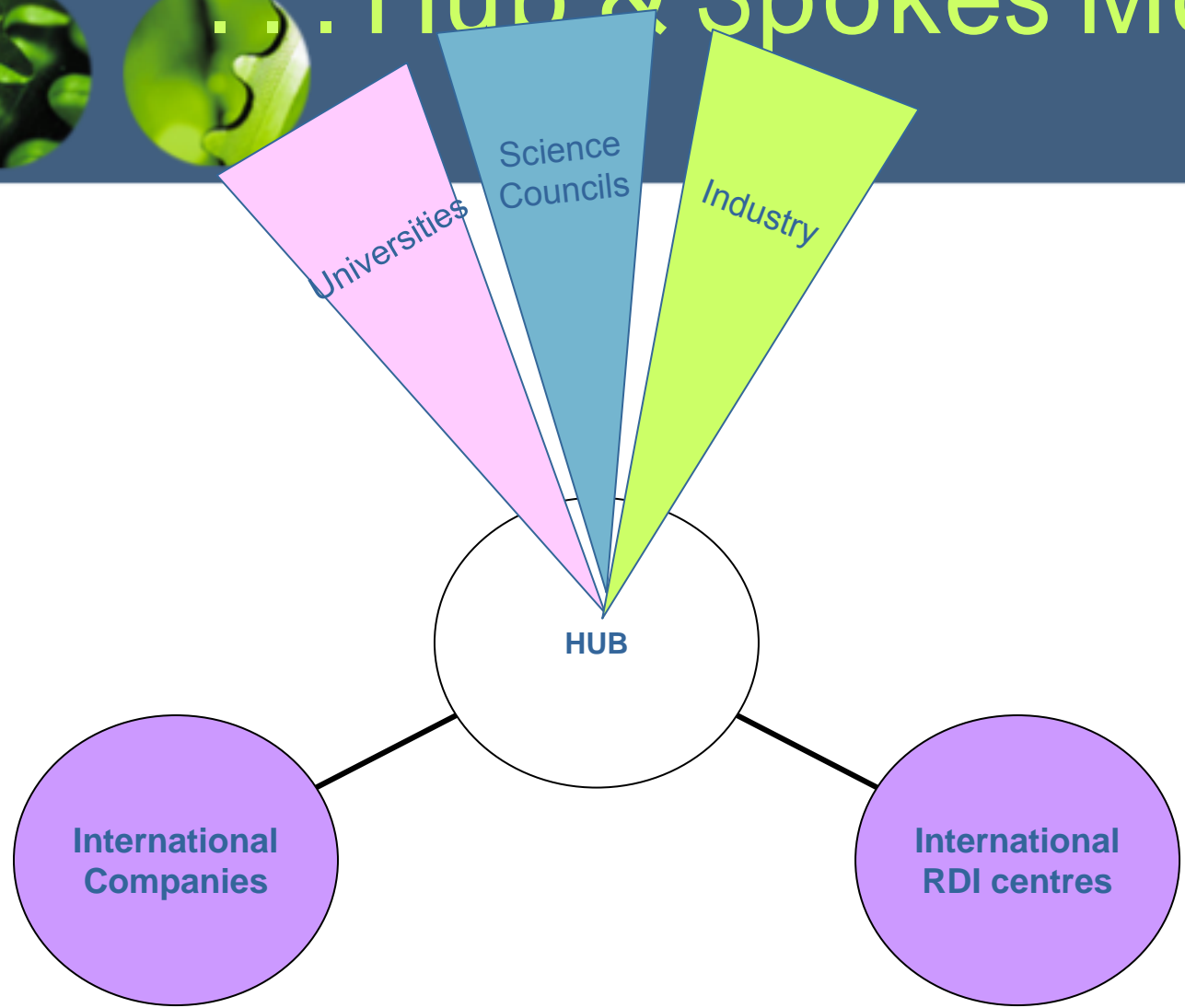
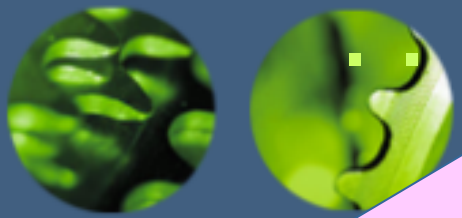
...Strategic Goals

- Develop local cost competitive hydrogen generation solution based on existing know-how
- Wealth creation through value added manufacturing of PGM catalysis, goal-supply 25% of catalysts demand by 2020
- Promote equity and inclusion in the economic benefits of South Africa's resources

Implementation



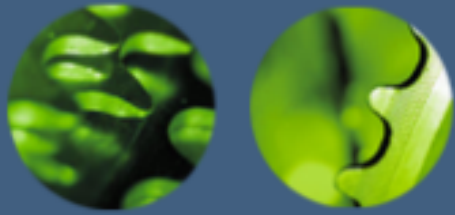
Hub & Spokes Model



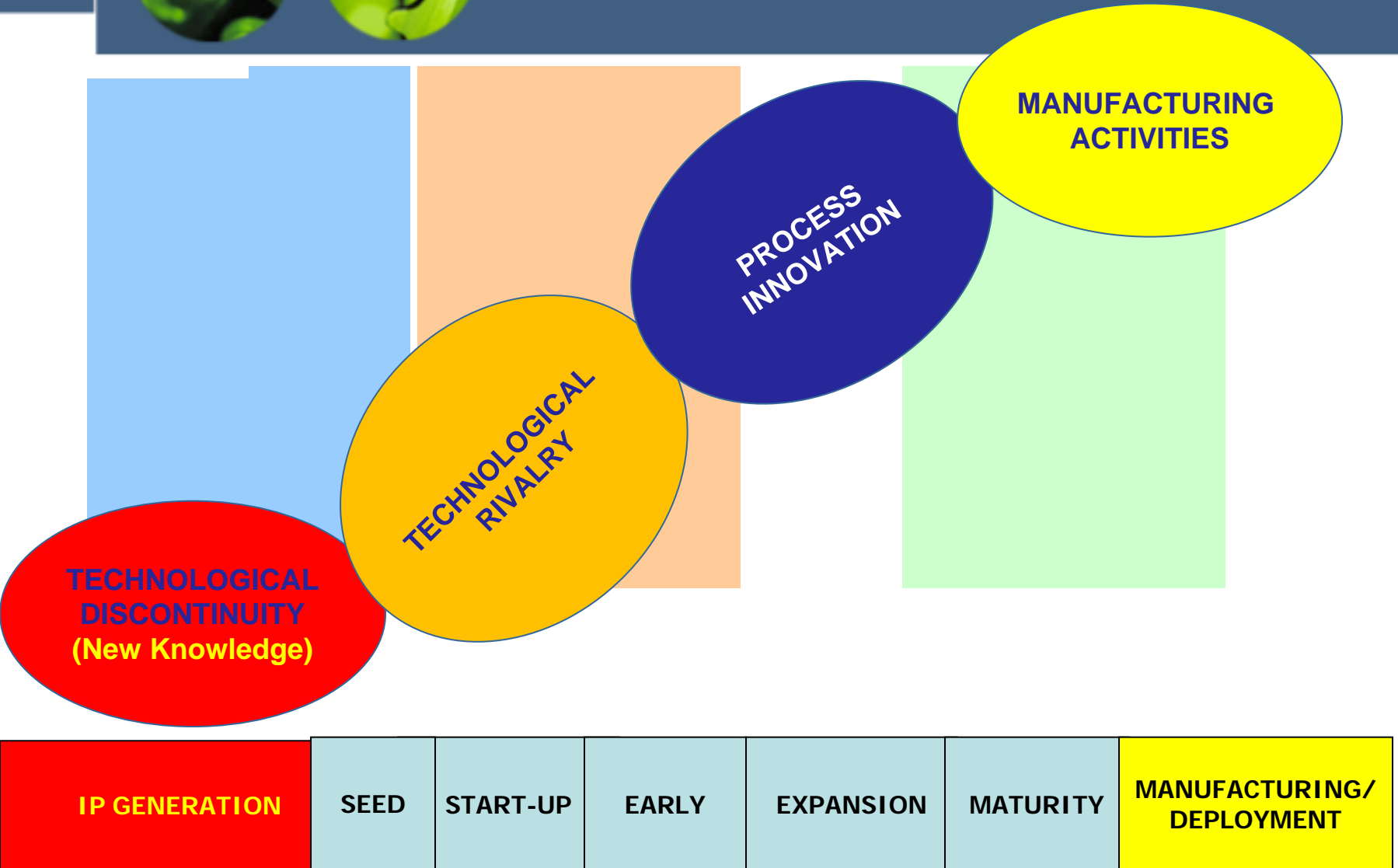


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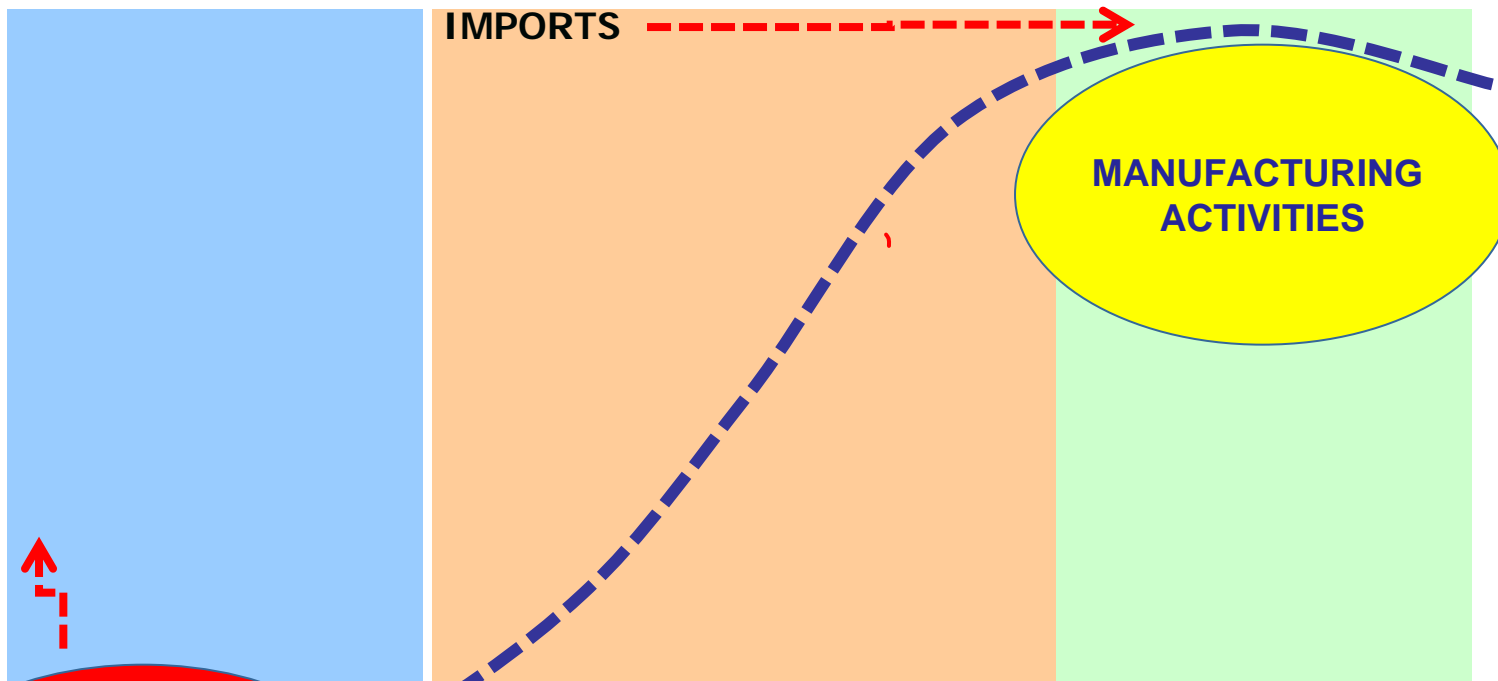
1. Establishment of Centres of Competence
 - HySA Systems: Systems Integration and Validation Centre of Competence
 - HySA Catalysis :Hydrogen Catalysis Centre of Competence
 - HySA Infrastructure: Hydrogen Infrastructure Centre of Competence
 - R&D activities that are application driven and commercialisation of generated IP



The Innovation_Chain



THE INNOVATION CHASM IN SOUTH AFRICA



**TECHNOLOGICAL DISCONTINUITY
(New Knowledge)**

RETURN ON INVESTMENT IN R&D NOT REALISED

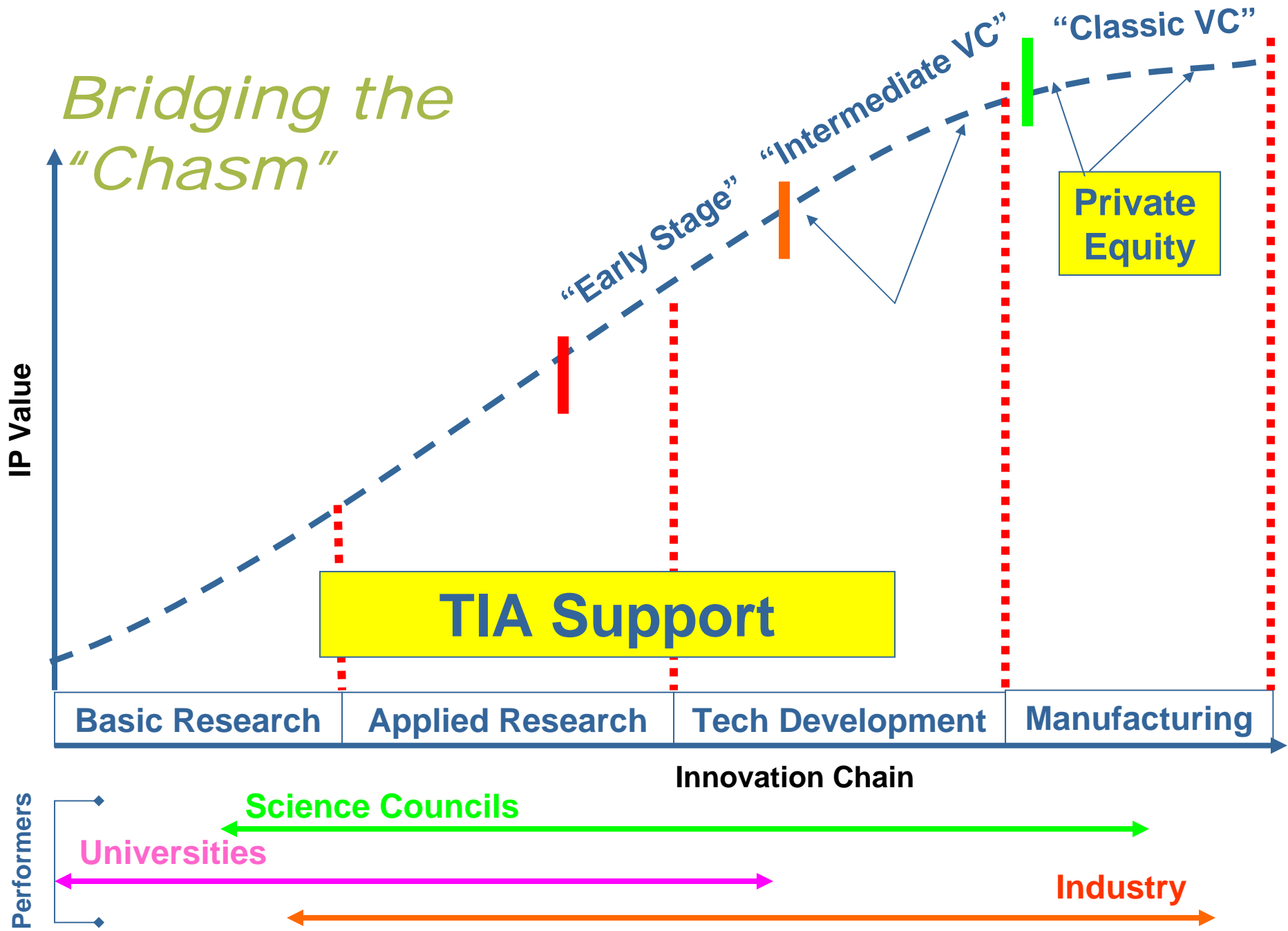
IP GENERATION	SEED	START-UP	EARLY	EXPANSION	MATURITY	MANUFACTURING
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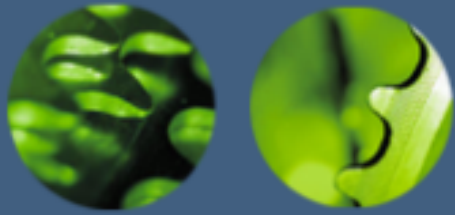


...Mechanisms

- Government's commitment of the 15 year programme
- Allocated a budget of R400 million Rand for three years from 2007 to 2011 (20% of the funding is allocated for collaboration with the private sector, of which the private sector must match at least rand for rand)
- Establishment of a Technology Innovation Agency to manage the implementation of HySA

Bridging the "Chasm"





TIA products and services

- The range of proposed TIA products and services include:
- **Innovation financing** (including providing seed, first and second stage funding towards the commercialisation of technology based products and services)
 - **Technology development** (including technical and advisory services relating to nurturing of technologies and implementation)
 - **Contracting services** (for example, contracting and managing research services on behalf of other role-players and TIA clients)
 - Capacity building (including institutional and human capital development)



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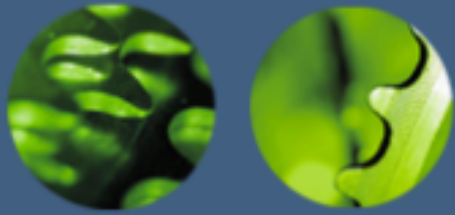
. . . Progress to date

- R&D work already in progress- **R192MILLION** for 2008/2009 and 2009/2010 financial years
- Technology Innovation Agency now established- TIA board in place
- Migration of Implementation Agencies in progress, HySA to be fully under TIA management by January 2010
- Tripartite partnership has been established DST-Anglo-Platinum and Johnson Mattheys (UK)
- Anglo Platinum launched a **R1 MILLION** to facilitate the establishment of fuel cell manufacturing Industry in South Africa



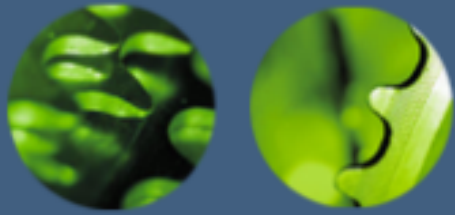
. . . Progress to date

- PPP co-funded Techno-economic study to investigate the viability of establishing a local “Hydrogen Economy”
- Negotiations for the establishment of the first fuel cell manufacturing company in South Africa at an advanced stage.
- Technology transfer agreements already in place (German, Norway, UK and Russia)
- SME should have a central role to play in commercialising the resultant technologies



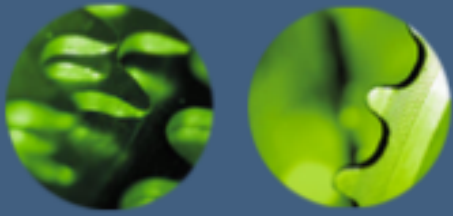
... Public Awareness and Demonstration

- Create awareness, visibility and acceptance amongst the public, entrepreneurs and key decision makers in South Africa about the operability, safety, high performance and low emissions of clean transportation technologies



... Partnerships

- Application for IPHE membership already submitted
- HySA website in its finalisation stage and will be ready by December
- EC Delegation visiting South Africa in November to discuss areas of mutual benefits for collaboration- Energy
- Discuss how HySA can collaborate with the JTI going forward



• THANK YOU