



DST Annual report – 2008/09 financial year

Presentation to the Select Committee on
Education and Recreation, Arts & Culture
and Science & Technology
4th November 2009



Outline

- Key objectives of the Department
- DST Programmes
- Selected indicators and performance
- Service delivery highlights
- Financial performance of the Department
- Human Resources information
- Performance by entities reporting to DST
- Conclusion



science
& technology

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Key objectives

- To develop the innovation capacity of the science system and contribute to socio-economic development.
- To develop appropriate human capital for research, development and innovation (RDI).
- To build world-class RDI infrastructure.
- Position SA as a strategic international RDI partner and destination Develop South Africa's knowledge-generation capacity.



DST programmes



Selected indicators and actual performance

Indicators	Annual Targets		
	2006/07	2007/08	2008/09
Amount leveraged from international sources	R70m	R94m	R189m
Number of new bilateral projects	60	64	86
Number of students on the special bursary programme <i>271 honours and 50 masters students (total 321) were awarded bursaries.</i>	-	280	415

Selected indicators and actual performance

Indicators	Annual Targets		
	2006/07	2007/08	2008/09
Number of interns supported	49	68	174
Total number of Centres of Excellence established	7	7	8
Total number of Research Chairs established	21	72	72

Selected indicators and actual performance

Indicators	Annual Targets		
	2006/07	2007/08	2008/09
Number of PhDs and postdoctoral fellowships supported at science councils and higher education institutions	113	107	155
Number of joint science and technology project activities between the DST and other departments	2	6	14
Number of flagship projects supporting strategic areas of R&D	6	11	13



Corporate Services and Governance

Corporate
Services
& Gov

- Responsible for overall management of DST
- Provide central support to funded organisations to comply with good governance practices and alignment to strategic focus of NSI
- Monitoring and evaluation of science councils



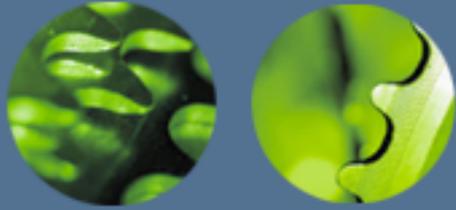
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Corporate Services and Governance – Achievements

- Key performance indicator (KPI) reports were completed, and a report on the performance of all SETIs was compiled.
- Unqualified audit opinion with Auditor-General reporting that no significant findings have been identified on performance information.

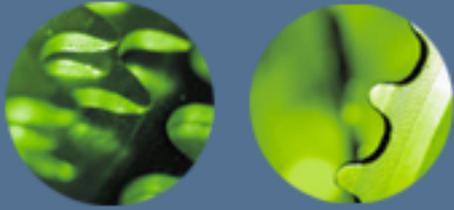


Research, Development and Innovation (RDI)

**Research
Development
& Innovation**

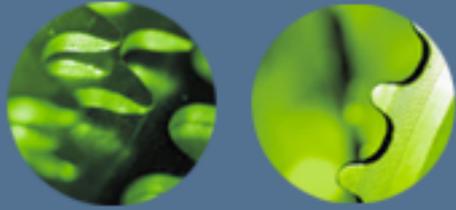
- Sub-programmes
 - Space science
 - Hydrogen and energy
 - Innovation Instruments and Planning
 - Biotechnology and health

Provide policy leadership in long term and cross cutting research and innovation



Service Delivery Achievements – RDI...

- Enactment of the following pieces of legislation:
 - Intellectual Property Rights (IPR) Act (Act No. 51 of 2008)
 - Technology Innovation Agency (TIA) Act (Act No. 26 of 2008)
 - South African National Space Agency Act (Act No. 36 of 2008)



Service Delivery Achievements – RDI...

- Launch of South African designed electric prototype vehicle for demonstration in September 2008.
- Launch of the Hydrogen and Fuel Cell Technology Strategy.
- TIA Interim Project Management Office and Process Manager in place.
- The ingestion system for the reception of China-Brazil Earth Resource Satellite and Argentinean Satellite (SAC-C) data in place.

Co-investments with Industry

Implementation of the DST's Hydrogen and Fuel Cell Technologies RDI Strategy (HySA):

- ❖ PetroSA has invested R10 million for the construction of HySA laboratory for HySA Systems Integration;
- ❖ Forma-tech (German fuel membrane producer) has signed a technology transfer agreement and invested R300 thousand into HySA Systems Integration;
- ❖ Tripartite Partnership between DST, Anglo Platinum and Johnson Matthey for fuel cell development-
 - ❖ *Anglo Platinum has launched a R100 million Development Fund to promote commercialisation of Platinum Group Metal technologies in South Africa,*
 - ❖ *Anglo Platinum has invested \$5 million for design, manufacture and assembly of fuel cells (DST to match).*



The Joule

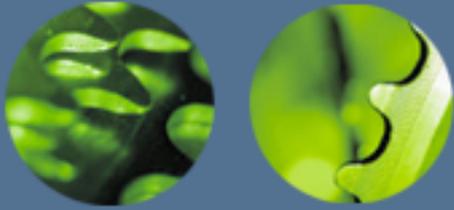


- ❖ Launch of the South African-designed electric vehicle, the Joule
- ❖ The battery accounts for 50% of the cost of the Electric Vehicle;
 - ❖ South Africa has a long history of Research and Development in advanced battery technology;
 - ❖ Patents have been registered and publications generated on the subject
- ❖ The DST is setting up platforms to consolidate and develop South African capabilities in advanced battery technologies.



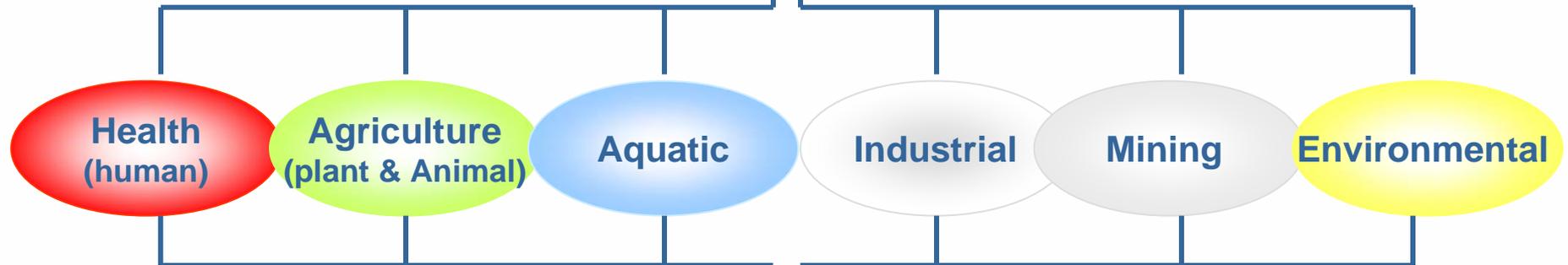
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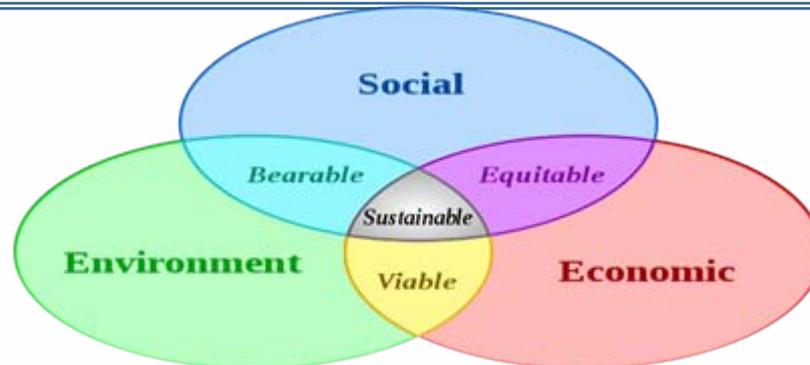


Bio-Economy Strategy

BIOTECHNOLOGY
Research, Development & Innovation



SUSTAINABLE DEVELOPMENT



South African HIV/AIDS and Innovation Platform



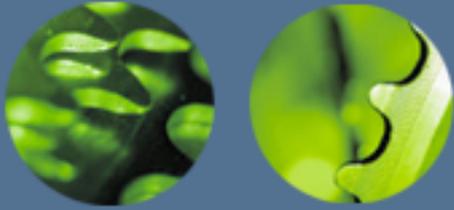
- ❖ Provide funding for **novel, innovative and pioneering research** in the prevention and treatment of HIV/AIDS
- ❖ Facilitate and encourage the **commercialization of products** arising from research
- ❖ Management of **intellectual property** and **technology transfer**

Develop human capital ❖ Enhance collaboration ❖ Attract funding partners ❖ Facilitate networking and knowledge sharing

South African Tuberculosis Centre of Competence

- ❖ Develop a **globally compatible portfolio of projects** with appropriate partners aligned with the vision of the TB CoC
- ❖ Facilitate the **transfer of TB research outputs into commercially viable outcomes** of social benefit to South Africa in the focus areas of drugs, vaccines and diagnostics

Develop human capital ❖ Enhance collaboration ❖ Attract funding partners ❖ Facilitate networking and knowledge sharing



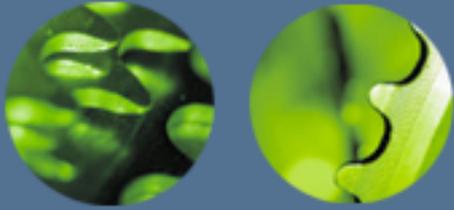
Houwteq (ISSA)

- ❖ Houwteq facility which is currently known as Institute for Software and Satellite Application (ISSA) is ear-marked for South African National Space Agency (SANSA);
- ❖ The facility currently belongs to Denel Pty Ltd who has indicated their intention to transfer the facility to SANSA;
- ❖ The Department of Science and Technology (DST), together with the Departments of Public Enterprise, Public Works and Communications, are currently in discussions with Denel for the acquisition and upgrade of Houwteq, as Houwteq is considered a critical facility in terms of South Africa's future space initiatives.



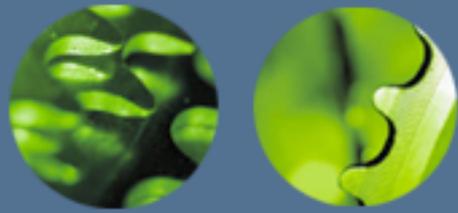
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Houwteq in Grabouw

- ❖ Established in mid 80's to support the RSA air force space program.
- ❖ The defense program was cancelled in the early 90's and civilian application (Green SAT) was cancelled in 1995;
- ❖ Houwteq has been under utilized in the past 15 years with resultant degradation of capabilities (Space activities reduced to 2 micro satellites: Sunsat and Sumbandilasat).
- ❖ Some facilities remain which could be upgraded and used for future satellite application:
 - ❖ Satellite integration chamber
 - ❖ thermal vacuum chamber
 - ❖ mass property,
 - ❖ anechoic chamber for EMC tests,
 - ❖ 3-D measurement and Radiometric Test and calibration equipment and
 - ❖ vibration and acoustic noise facilities.



Square Kilometre Array Project

- ❖ An international ‘megascience project’
 - ❖ 55 of the world’s top research institutions (Oxford, Cambridge, Caltech, Berkeley, Cornell, IBM, Sony) across 19 countries
 - ❖ Construction of world’s largest, most sophisticated and technologically advanced astronomical facility
- ❖ Commissioning in 2021 for €1.5 billion + €150 million per annum for 50 years operation
- ❖ South Africa + 8 African countries shortlisted to host the SKA (along with Australasia)



South African SKA successes

- ❖ Attracted further international projects (CBASS, PAPER)
 - ❖ Addressing afro pessimism and building collaborations
- ❖ International collaboration in high-tech development (CASPER)
 - ❖ Participation in knowledge economy
- ❖ Development of local expertise through industry engagement
 - ❖ Mission driven innovation in a benign environment



World's first 'plastic' radio astronomy dish, developed by SA contractor.

SKA Pathfinders: MeerKAT



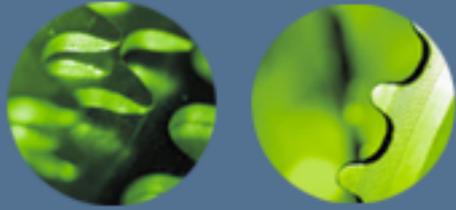
Support base, Carnarvon



Onsite facility



MeerKAT telescope to be a premier astronomical facility until SKA



Socio-Economic Benefits to date

- ❖ MeerKAT construction
 - ❖ 592 local jobs for previously disadvantaged
 - ❖ Total local contribution: R11,4 million
 - ❖ Local business and hospitality industry experienced 30-50 % increase in turnover during 2008/09
- ❖ Outreach/Education
 - ❖ Cyberlab established at Carnarvon High School
 - ❖ Maths/Science teacher training
 - ❖ Private sector partnerships established for software



International Cooperation and Resources (ICR)



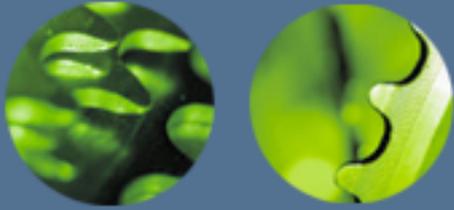
International Cooperation & Resources

- Sub-programmes
 - Multilaterals and Africa
 - International Resources
 - Bilateral Cooperations
- To develop and monitor bilateral and multilateral relationships and agreements in S&T
- Strengthen the NSI and enable the flow of knowledge, capacity and resources into South Africa and neighbouring countries



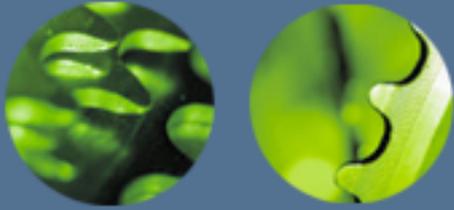
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Service Delivery Achievements – ICR...

- Through Overseas Bilateral Cooperation (OBC) over 100 R&D projects in areas such as energy, space, ICT and biotechnology were implemented
- International bilateral agreements served as a basis for implementing the cooperation in the India-Brazil-SA framework and other flagship projects
- Achieved 125 new joint projects: Africa (4), Asia & America(35), and Europe and Gulf (86)
- A total of 115 new bilateral projects were established in 2008/09



Service Delivery Achievements – ICR...

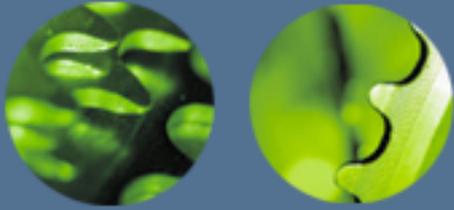
- Acquired R338 million in international sources during 2008/09 financial year
- Secured €30 million to address poverty, underdevelopment and marginalization through S&T interventions
- Received €3 million from Finland through The Cooperation Framework on Innovation Systems between Finland and South Africa (COFISA) for S&T in Africa
- Continued with financial support of NEPAD flagship initiatives on S&T



Human Capital and Knowledge systems (HC&KS)

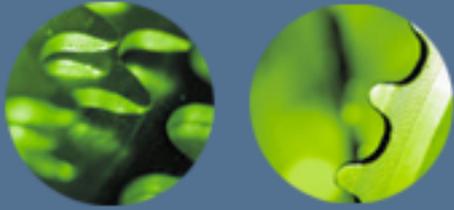


- Sub-programmes
 - Human Capital and Science Platforms
 - Indigenous Knowledge Systems
 - Emerging Research Areas and Infrastructure
- Development and implementation of national programmes to produce knowledge, human capital and associated infrastructure, equipment and public research services to sustain the NSI



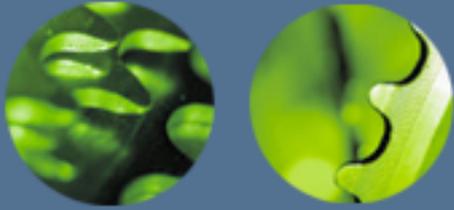
Service Delivery Achievements – HC&KS

- 10 new South African Research Chairs were established in addition to the 72 already established
- Postdoctoral Programme supported 70 fellows of which 40 were new enrollments
- 271 honours students in science, engineering and technology were supported
 - 85% were black students
 - 55% were females
- 2 550 learners participated in DST adopted Dinaledi schools



Service Delivery Achievements – HC&KS

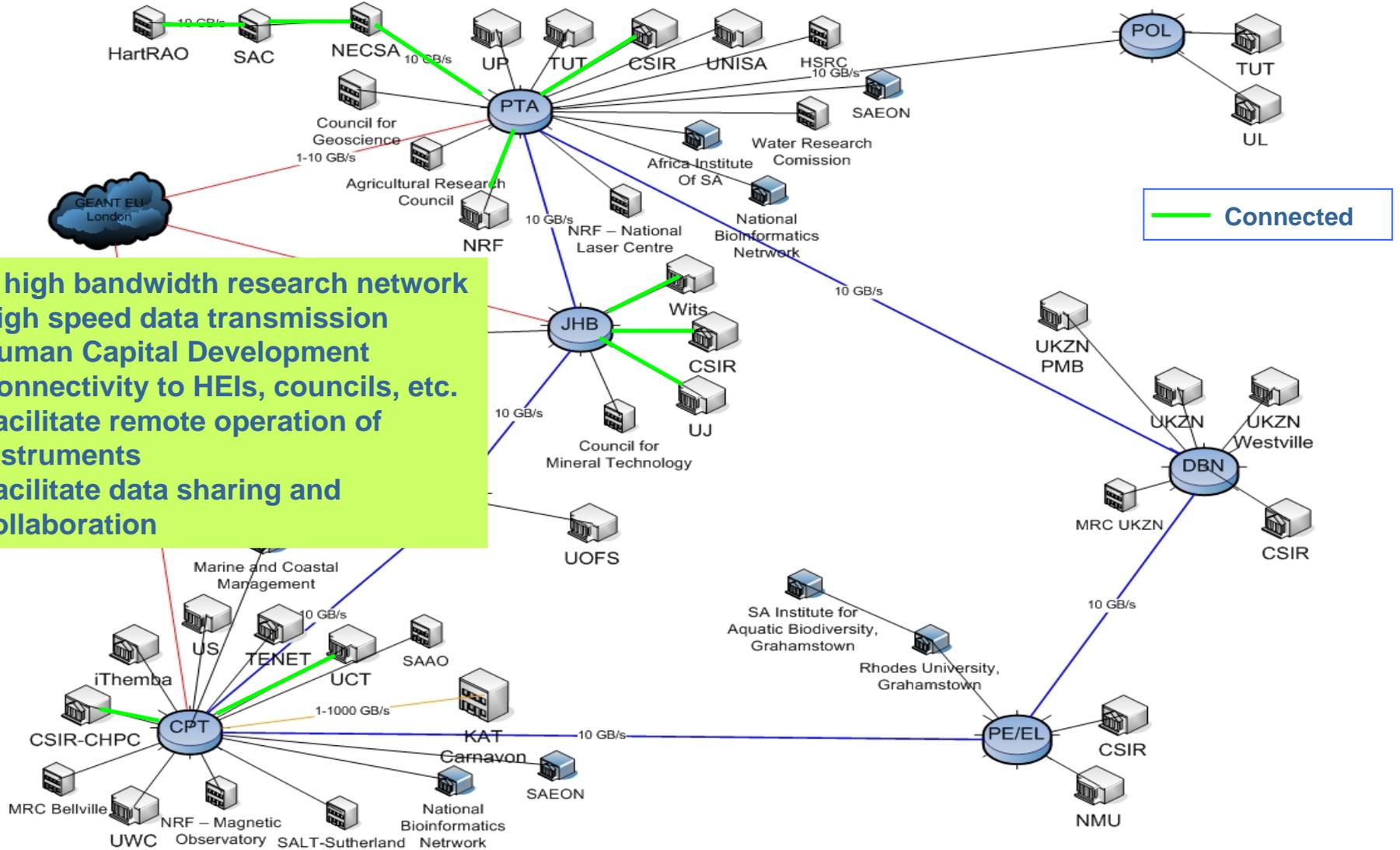
- 651 Mathematics and Science teachers were equipped with the necessary competencies to delivery the SET curriculum
- 92 unemployed science graduates were placed in Internship Programme and 124 entered the National Youth Service Programme
- 195 000 people participated in the 67-sites country-wide National Science Week, of whom 89% were learners



Service Delivery Achievements – HC&KS

- South African Strategic Research Infrastructure Forum (SASRIF) was successfully launched
- Successful establishment of Nanotechnology Health, Safety and Environment (HSE) Research Platform and Nanoscience Centre
- Bachelor of Indigenous Knowledge Systems qualification has been registered with SAQA

SANReN Connectivity Roll-out



- A high bandwidth research network
- High speed data transmission
- Human Capital Development
- Connectivity to HEIs, councils, etc.
- Facilitate remote operation of instruments
- Facilitate data sharing and collaboration



CHPC: Host for Blue Gene for Africa Initiative

Flagship Projects:

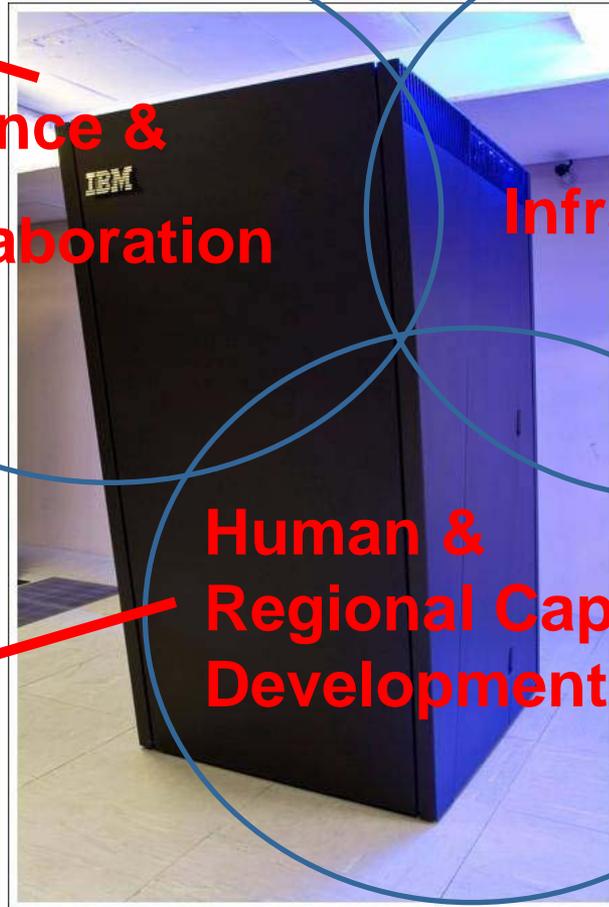
- Climate Change
- HIV/AIDS
- Food Security
- Grid Computing

Science & Collaboration

Infrastructure

Human & Regional Capacity Development

Fellowship and Mobility

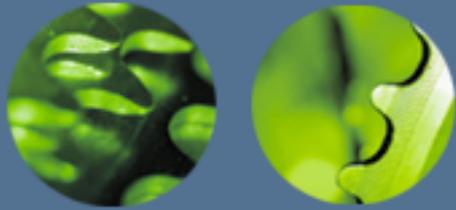


Launched
October 2008



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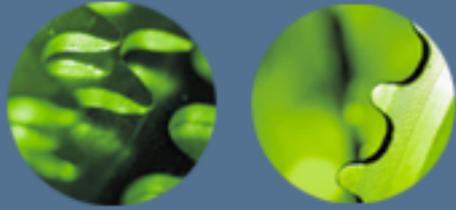
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Socio-Economic Partnerships (SEP)

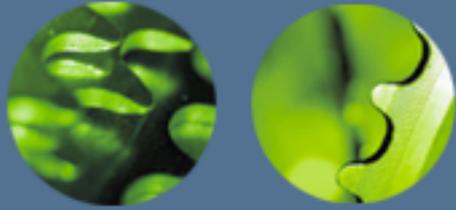


- Sub-programmes
 - S&T for Economic Impact
 - S&T for Social Impact
 - S&T Investments
- To provide policy, strategy and direction-setting support for R&D-led growth of value-adding industries
- to enable government, industry, and the general public to understand and deal with the challenges of global change better
- for evidence-based research on the human and social dynamics of development
- to enhance government decisions making on S&T (including R&D) as productive investments



Service Delivery Achievements – SEP...

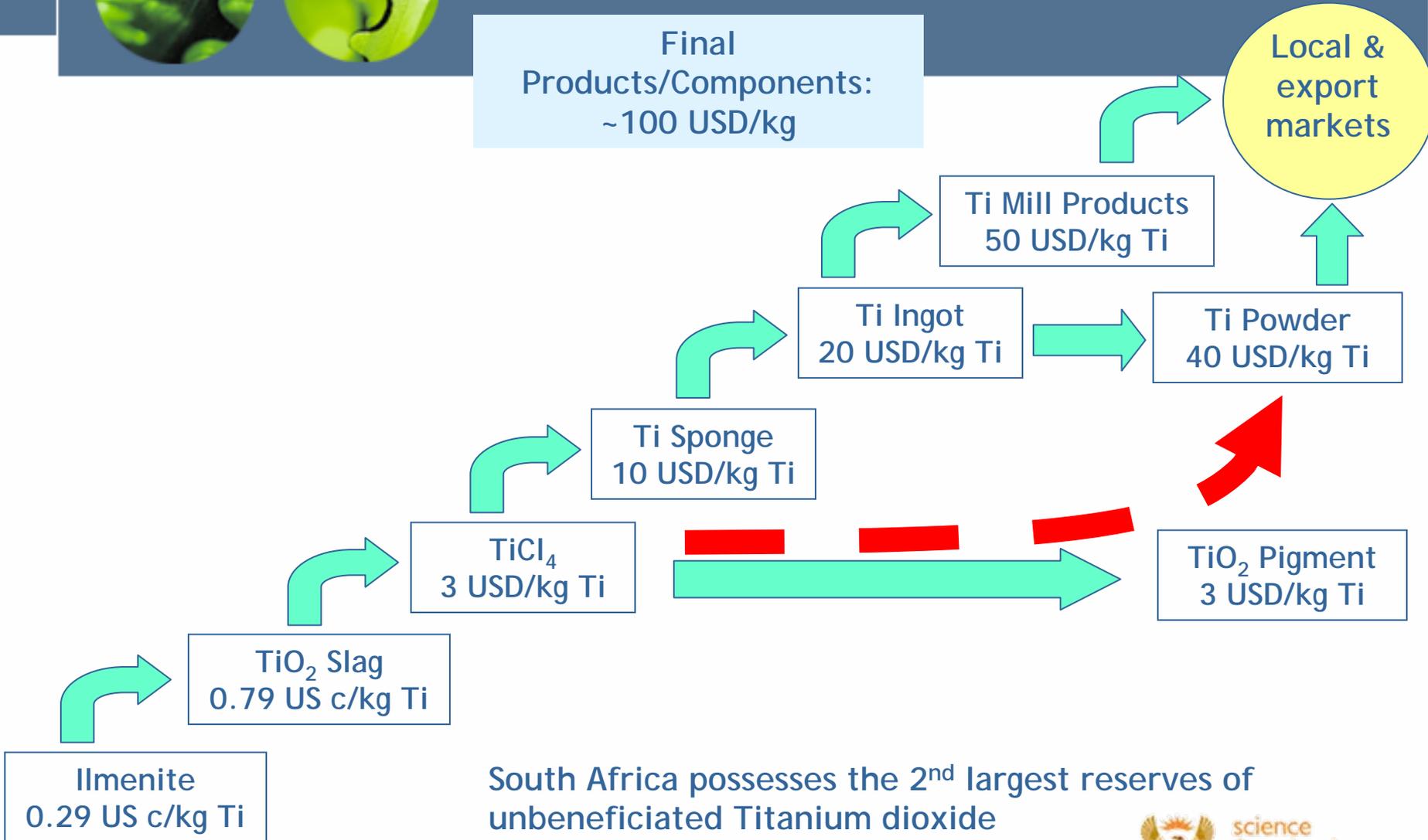
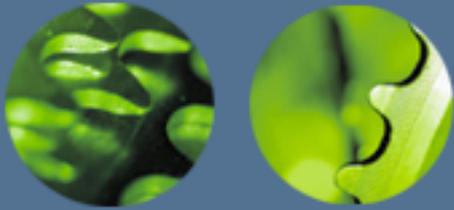
- Advanced Fire Information Service developed through ICT R&D strategy Geomatic Platform.
- Initiated a larger-scale demonstration of a wireless mesh network as part of investigations on broadband connectivity.
- Joint DST/DWAF project on innovative alternative technologies for water supply and access has been established.



Service Delivery Achievements – SEP...

- Memoranda of understanding on joint S&T projects concluded with 6 National Departments.
- Developed automated system for collecting data on public expenditure on Science and Technology Activities (STA).
- A report on publicly financed scientific and technological activities has been compiled for submission to Cabinet.

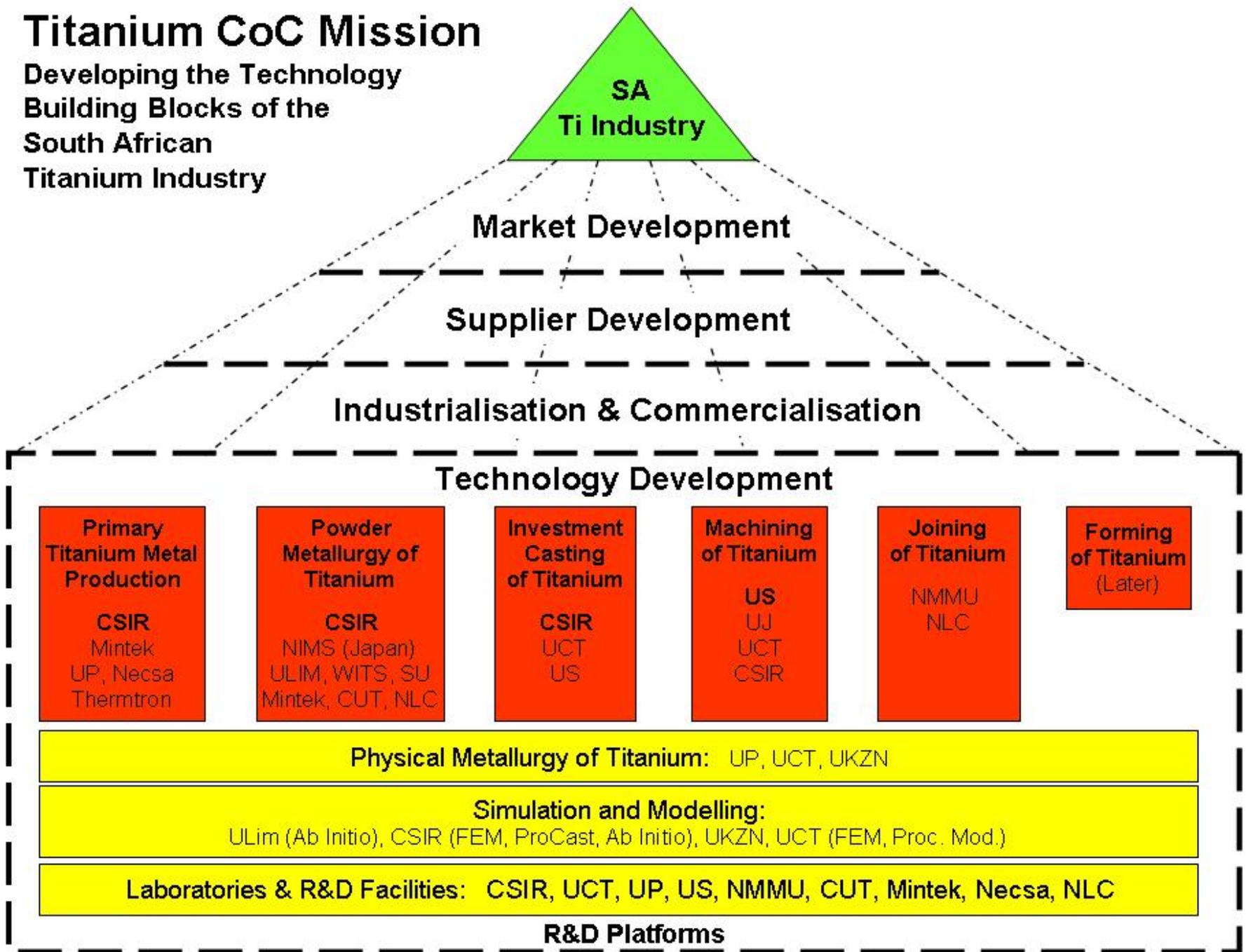
Titanium value-chain analysis

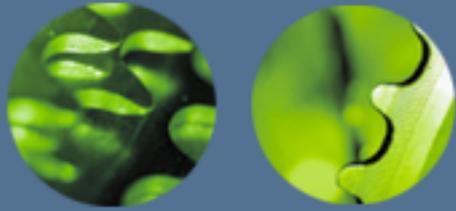


South Africa possesses the 2nd largest reserves of unbeneficiated Titanium dioxide

Titanium CoC Mission

Developing the Technology
Building Blocks of the
South African
Titanium Industry





Technology Localisation Strategy

Progress to date

- Finalised customised technology benchmarking tool with UNIDO;
- 100 Companies in Foundry industry already benchmarked;
- Industry overview studies (Foundry, Nuclear) nearing finalisation;
- A 'Transformers and Motors' Hub is being set up;
- 10 Companies identified for benchmarking and TAPs in 'decoder manufacturing industry';
- Local OEM identified for manufacturing haulage trucks.
- National Nuclear Manufacturing Centre established with last stages needed for ASME III accreditation;
- Information gathering sessions on technology localisation held with Westinghouse and AREVA;

FEI:
INSTITUTIONS



Fluorochemical
Expansion Initiative

Fluorochemical Chair



Applied Chemistry Division

General
fluorochemical R&D

Hydrogen fluoride
and fluorine
technology

Inorganic fluorides



Fluorochemical Chair

Separation
technology
Organic chemistry

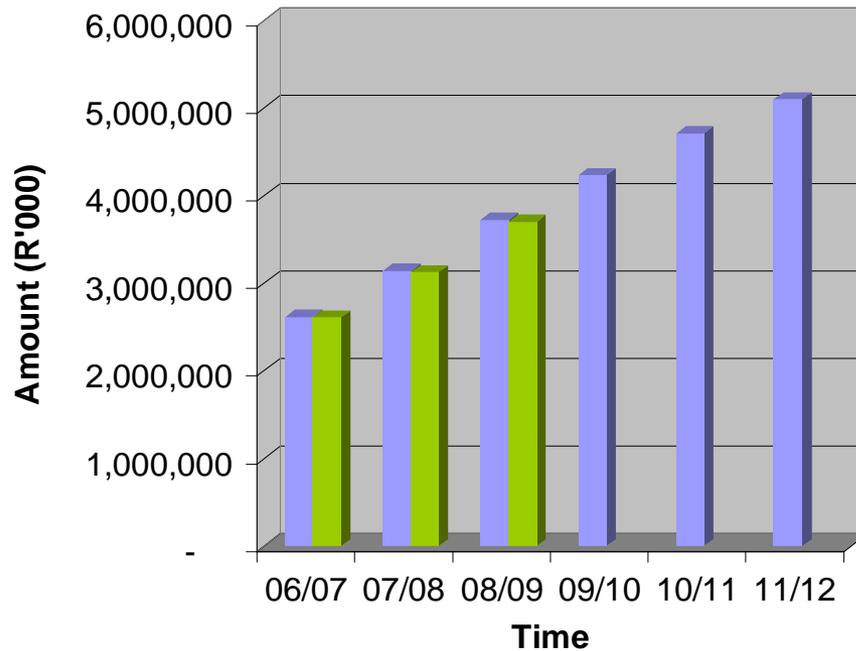
Fluoropolymer
s & elastomers

Fluoro-
materials
science

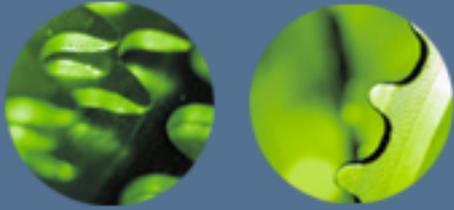
High
temperature
technologies

Fluorochemical
patents

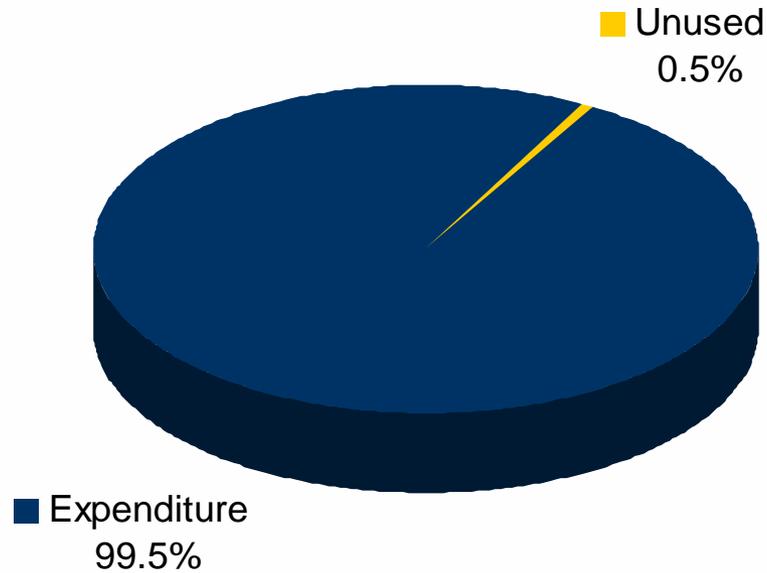
Financial performance



■ Amount voted ■ Actual expenditure



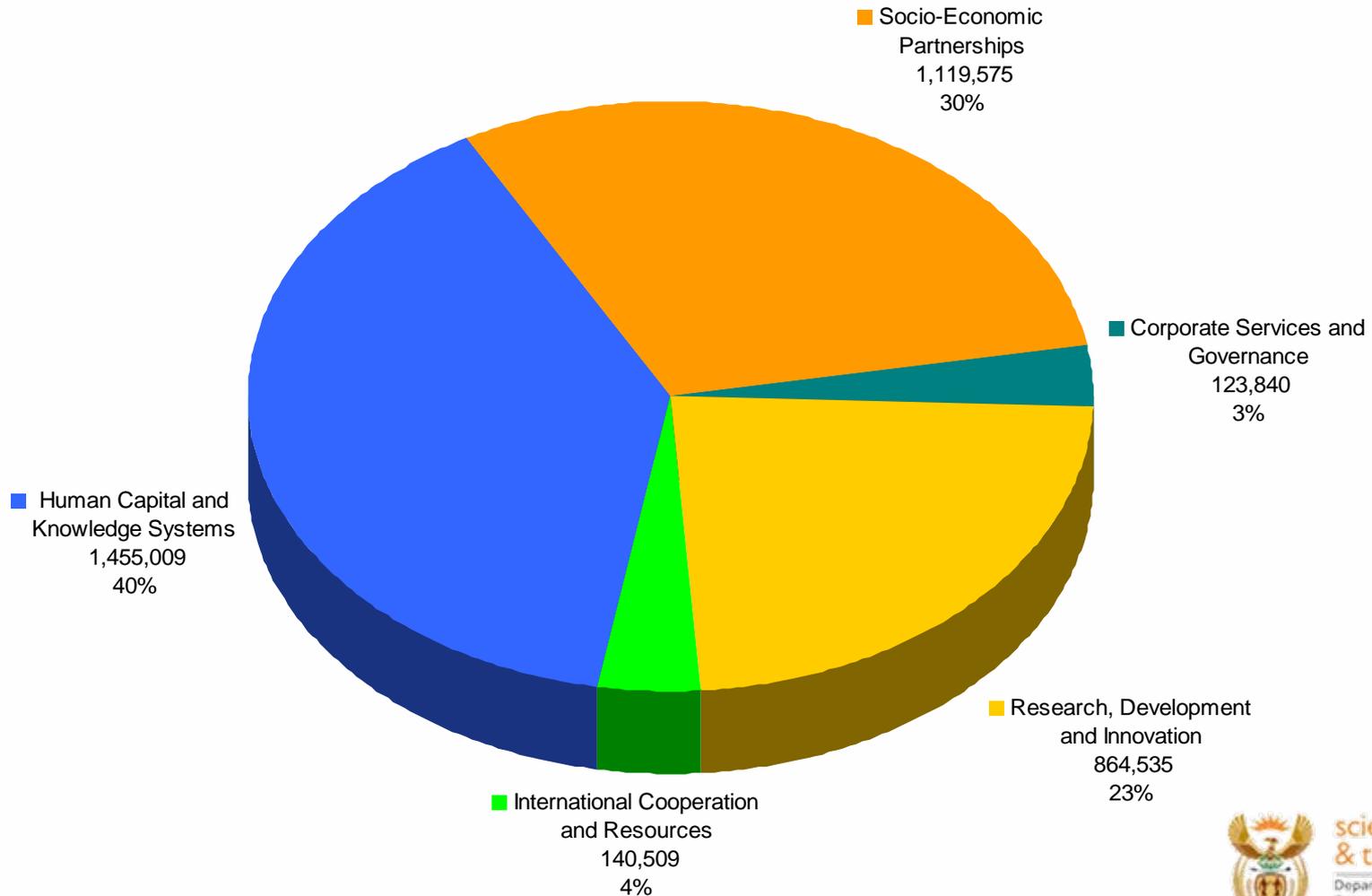
Budget utilisation rate



Unqualified audit



Spending per programme (R'000)



science & technology

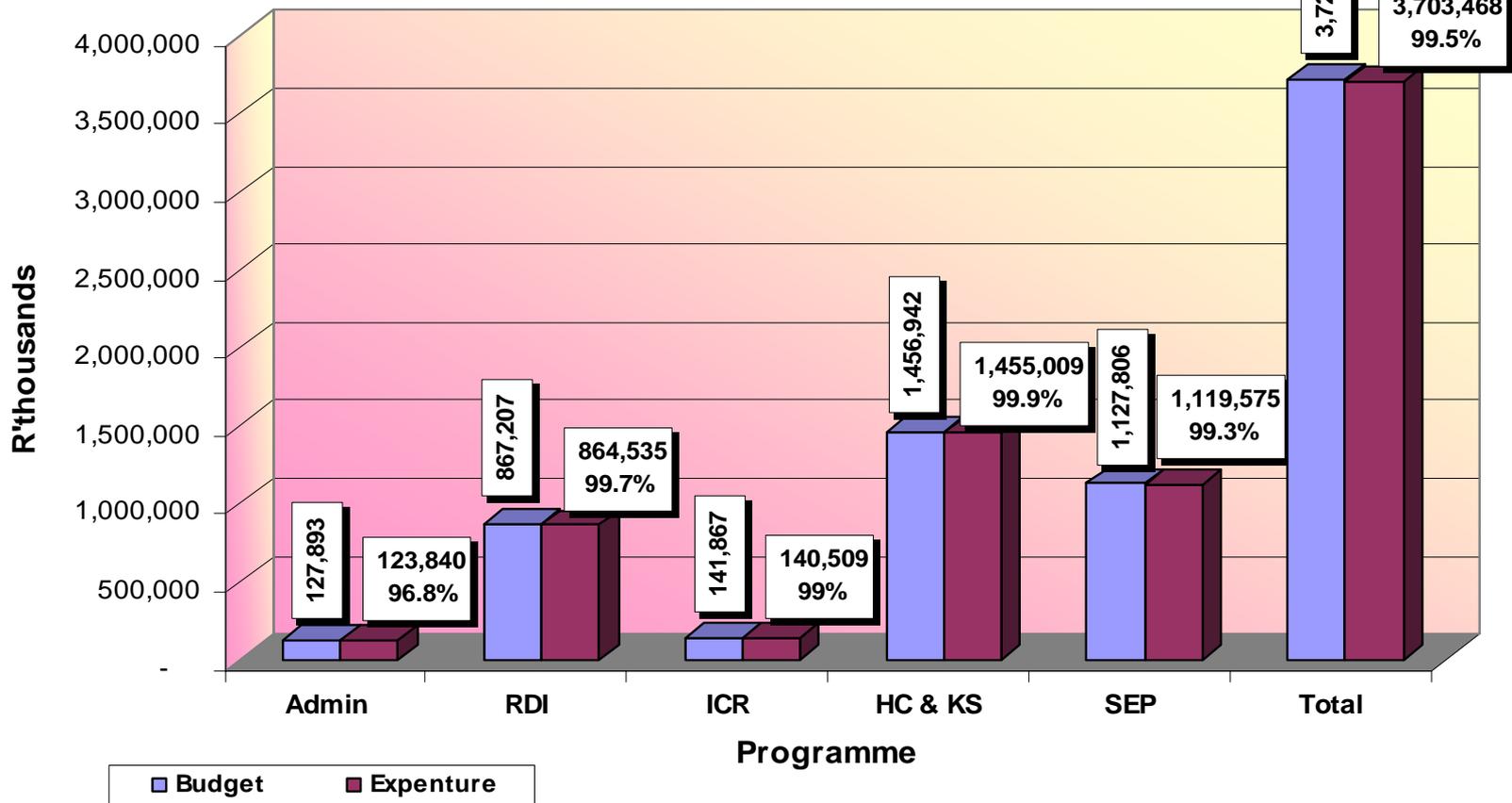
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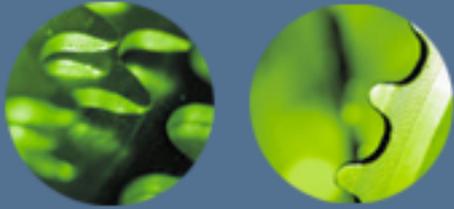


Financial performance

cont.

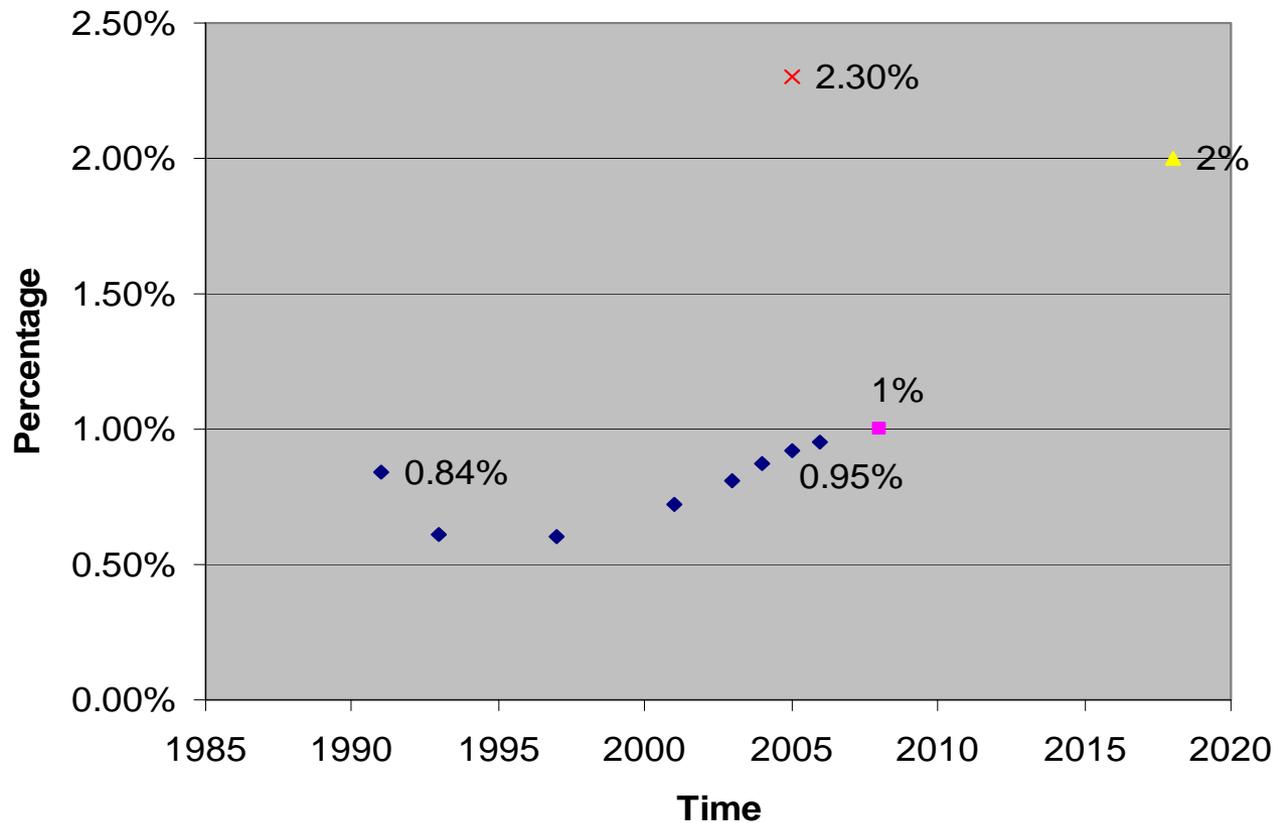
2008/09 Expenditure vs Budget per programme





Increasing R&D intensity

Gross Expenditure on R&D as a % of GDP

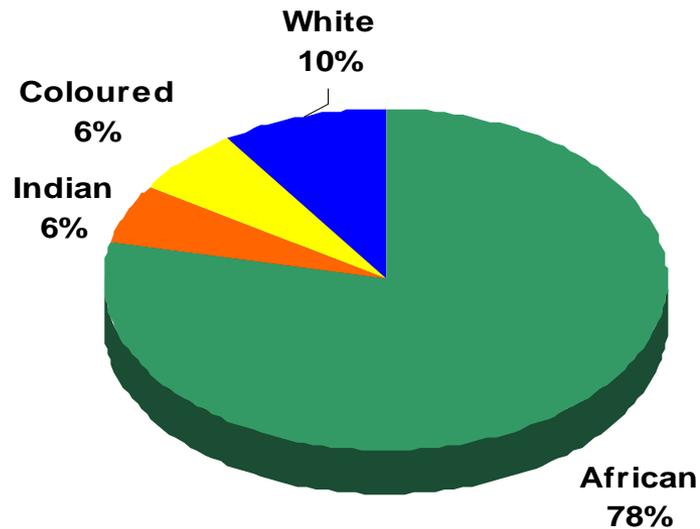


◆ Actual Gross Exp on R&D ■ Intermediate target ▲ Long term target × OECD Average

- OECD average 2.3% in 2005
- 2006 GERD as % of R&D at 0.95%
- Intermediate target 1%
- Long term target 2%



Demographic Representation of total Employment





Conclusion

- Overall the Department achieved and met most of its performance targets
- Human Capita Development being given priority
- Innovation instruments being put in place
 - Establishment of TIA and centres of competence
 - Establishment of Space Agency
 - IPR Act; TIA Act; SANSA Act
- Strong financial performance
- Performance by entities reporting to DST



Thank you



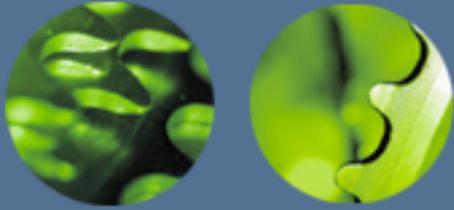
Performance - CSIR

- Greater African collaboration where traditional medicine meets science
- New ventures to produce rabies virus-neutralizing antibody from plants
- Piloted the cultivation of essential oil and medicinal plants
- Availability of quality remote sensing products - i.e. Reengineered of EODC with Data Information and Management System DIMS



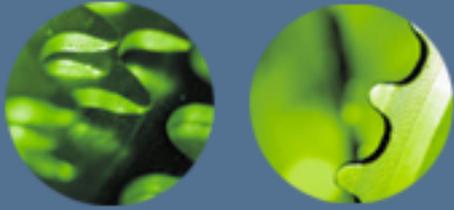
Performance - CSIR

- Survey of indigenous algal strains for biodiesel potential
- Tailoring the optical and structural properties of materials for clean energy
- Utilisation of laser technology for the better understanding of the atmosphere
- A flame-retardant, 'green' natural fibre solution for aircraft found
- Enhanced ICT portal for disabled persons



Performance – NRF...

- Research outputs and initiatives
 - 254 international research projects funded
 - A total 5600 publications and 14 patents
- Human Capacity Development
 - Science awareness programmes reached over a million people
 - More than 10 000 students got financial support
 - Grants amounting to R321 million were awarded to researchers
 - Rated researchers increased from 1653 in 2007/08 to 1922 in 2008/09



Performance - HSRC

- A total of 188 projects were undertaken in topics like:
 - democracy and governance
 - education
 - governance and society
 - children and youth
 - service delivery, and
 - poverty and job creation



Performance - HSRC

- Some of the projects undertaken included:
 - A study of violent offenders and xenophobia to deepen understanding of triggers of violent behaviour
 - A 15-year review of the Free State Provincial Government;
 - The State of the Nation book series
 - Effective functioning of the teacher education system project contributed to the DoE's 2007 National Policy Framework for Teacher Education and Development



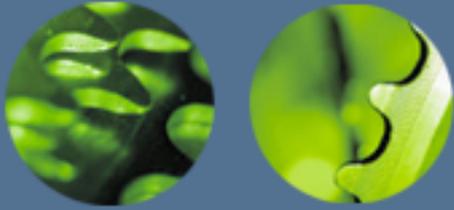
Performance- Tshumisano

- The following are some of the products that emanated from the activities of the technology stations:
 - Automated rolling device for processing icing for cake decorations
 - Ploughs for the ARC
 - Fail safe float valve and a water leakage detector
 - Reverse engineering of functional ornamental components for an emergency company
- Use of SMMEs by Puma to manufacture garments and goods for the 2010 FIFA World Cup



Performance - AISA

- Unqualified audit report is testament to the efforts that were made to turn AISA into an efficiently operating institution
- A 3-year research agenda has been approved that will focus on Africa integration
- A campaign has been initiated to campaign for scholars to publish outputs about Africa in Africa.



Performance - SANERI

- Initiated a community research project comprising agriculture, bioethanol plant, biodiesel plant, small soap factory, small glass factory, a marketing and distribution capabilities, etc.
- A study on the environmental effects of automobile energy use and supply in Johannesburg and Cape Town
- Operationalisation of a Centre for Carbon Capture and Storage through a public-private-international partnership
- Biofuels for sustainable rural development and empowerment of women study findings were published in New York as a book



Performance – ASSAf...

- The following are some of the studies that were initiated or continued during 2008/9 financial year:
 - State of humanities in South Africa
 - PhD study entitled ‘enhancing the production of postgraduates in South Africa’
- Scholarly Publishing Programme
 - A report on ‘A strategic approach to research publishing in SA was published in March 2008