



Presentation to the Seminars on European Cooperation in Science and Technology

Peacemaker Dlamini



science
& technology

Department:
Science and Technology
REPUBLIC OF SOUTH AFRICA

ICT Landscape within Government

- **Lead Government Departments on ICT**
 - The DoC responsible for policy, ICASA, SABC, Sentech, USAASA;
 - The DPE responsible for state enterprises including Broadband Infraco;
 - The DPISA responsible for SITA.
 - The dti responsible for enterprise development, state funding agencies, BEE enforcement and the Competition Commission; and
 - The DST responsible for developing strategies; funding of R&D, high-end human capital development and R&D enabling infrastructure.

Key Areas of Focus in ICT for DST

- DST responsible for R&D funding and promotion and influence ICT policy through technology demonstrations, e.g. WMN project.
- High level Human Capital Development.
- Develop multi-disciplinary technologies and methodologies to address Digital divide.
- Support the smart proliferation of ICT's into other sectors of the economy.
- Accelerate contribution of ICT in areas where market neglect is prevalent.



Policy landscape

Framework for funding of the NSI as described in the White Paper on S&T.

New public S&T missions

- Biotechnology
- ICT
- Advanced manufacturing
- Astronomy

Framework to develop the NSI and setting the vision for SA Science and Technology

S&T White Paper

R&D Strategy S&T missions

Creation of DST

ICT RDI Strategy

Strategic Objectives:

- Focused world-class research
- Build strong and robust innovation chain
- Advanced human resource capacity

ICT RDI Roadmap

framework to plan and coordinate technology development, as well as making sound investment decisions

1996

2002

2004

2007

2013



“It is good to be bold and ambitious”

Dr. Phil Mjwara – Director General of Science and Technology



science
& technology

Department:
Science and Technology
REPUBLIC OF SOUTH AFRICA

Context: Underinvestment in ICT R&D and international comparison

2009 data, pa	Population (million)	GDP \$Bn	GERD % GDP	ICT R&D as % GERD	ICT R&D as % GDP	ICT R&D Expenditure (\$Bn)	ICT Sector Size (\$Bn)
South Africa	50	286	0,92%	13,1%	0,12%	0,34	29
Brazil	191	1 572	0,9%	19,4%	0,46%	7,3	110
South Korea	49	929	3,0%	44,8%	1,73%	16,1	261
Australia	23	925	1,7%	15,9%	0,43%	4,0	129
Taiwan	23	379	2,3%	19,0%	1,85%	6,4	200

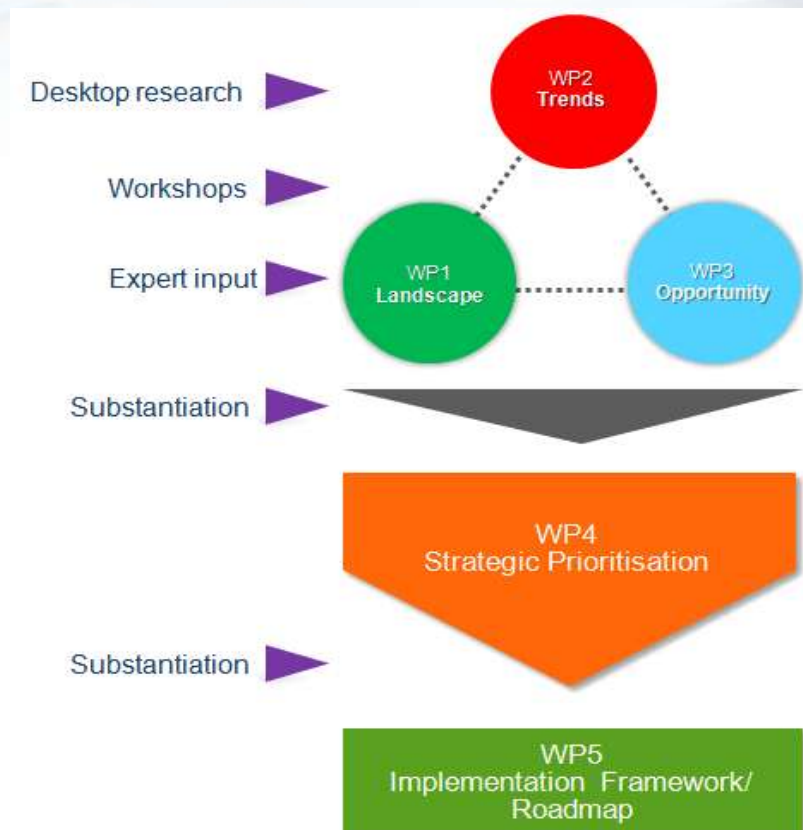
- ▶ South Africa spends close to **10% of GDP** on ICT goods and services, of which most are imported
- ▶ SA ICT sector in 2011 was R 187 billion (2020 estimation is R 250 billion)
- ▶ DGP over R 2 Trn.
- ▶ R&D intensity of South Africa has stabilised at around **0.92% of GDP** over the past few years, but is still well below the global norm of 2%
- ▶ The rate of PhD graduation in ICT related fields of study is very low.
- ▶ Government, universities and science councils have a keen interest in ICT RDI, but funding and current spending on ICT R&D is limited compared to other fields



The ICT RDI Roadmap: Purpose and Methodology

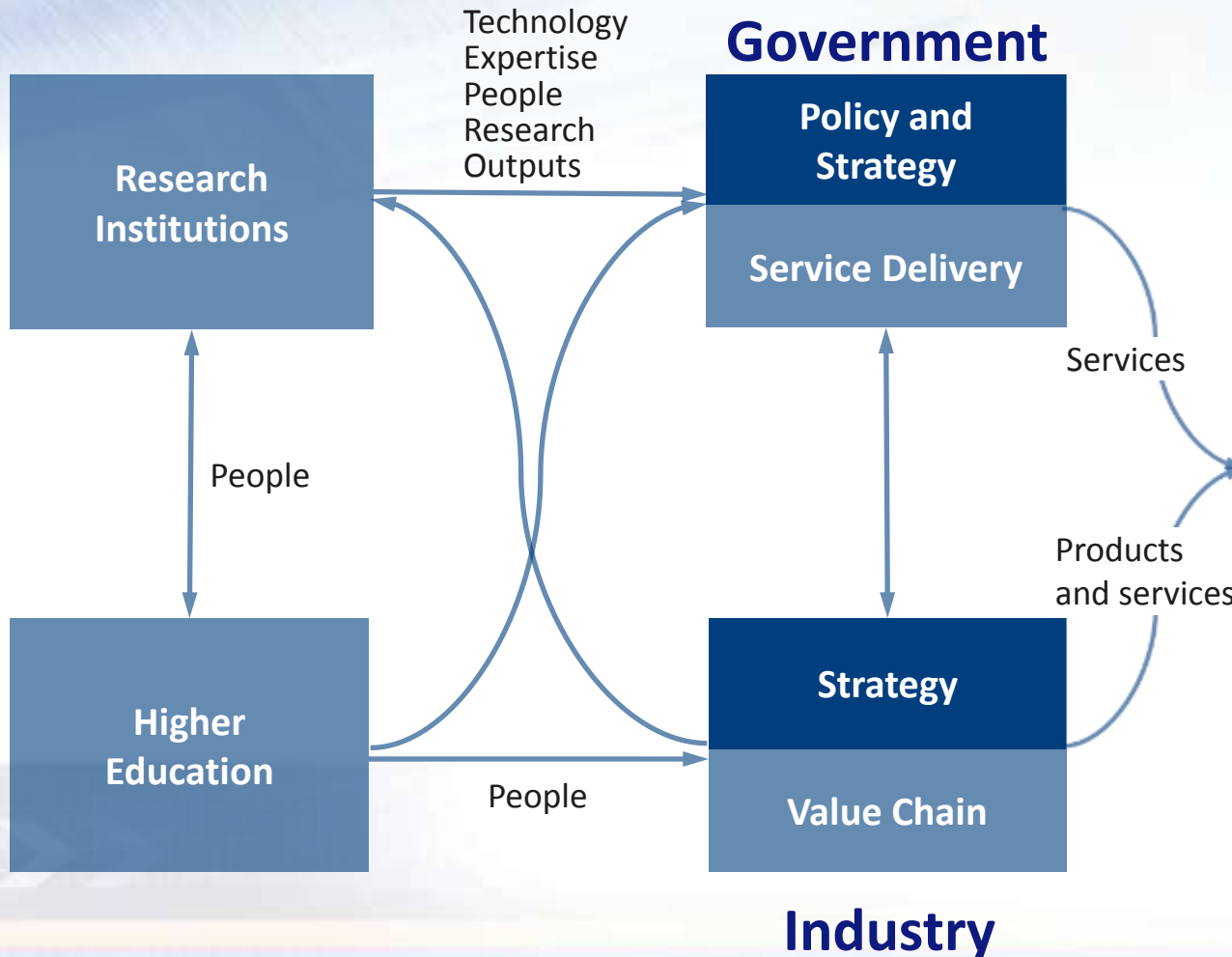
Purpose

1. Enable increased **public** and **private investment in ICT RDI** (by a factor of 3 to 4) by providing a mechanism to forecast technology developments in targeted areas; identifying critical areas that must be developed to meet SA's socio-economic objectives ; and by surfacing and demonstrating the ICT research community and sector's understanding and agreement on the **trends, market potential, priorities and investment** requirements.
2. Provide a **framework to plan** and coordinate technology developments both nationally and regionally – it serves as an anchor point for attracting increased public and private investment in ICT R&D and innovation.



Roadmap frames and guides ICT RDI activity – focus is on Impact

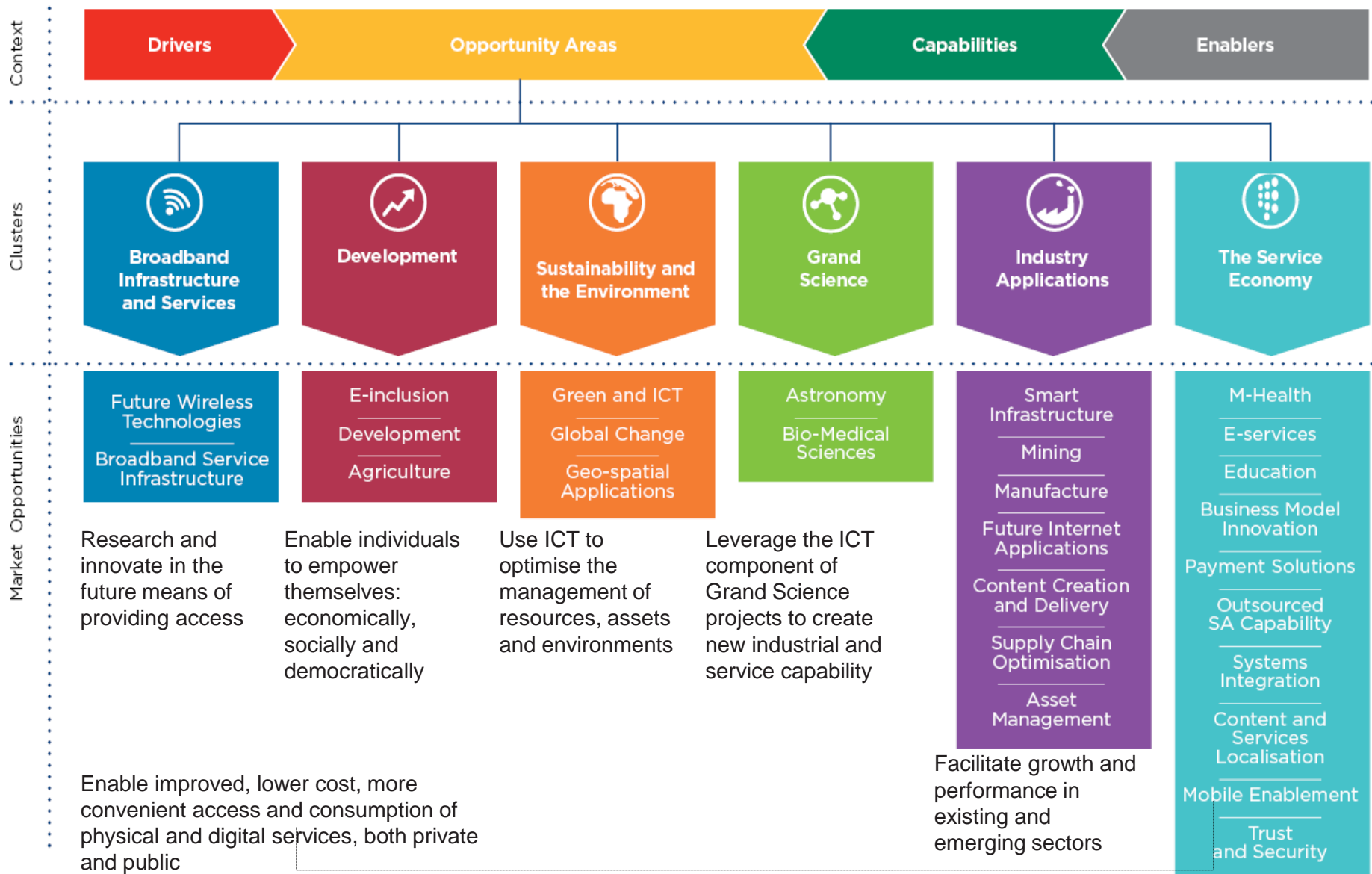
Society



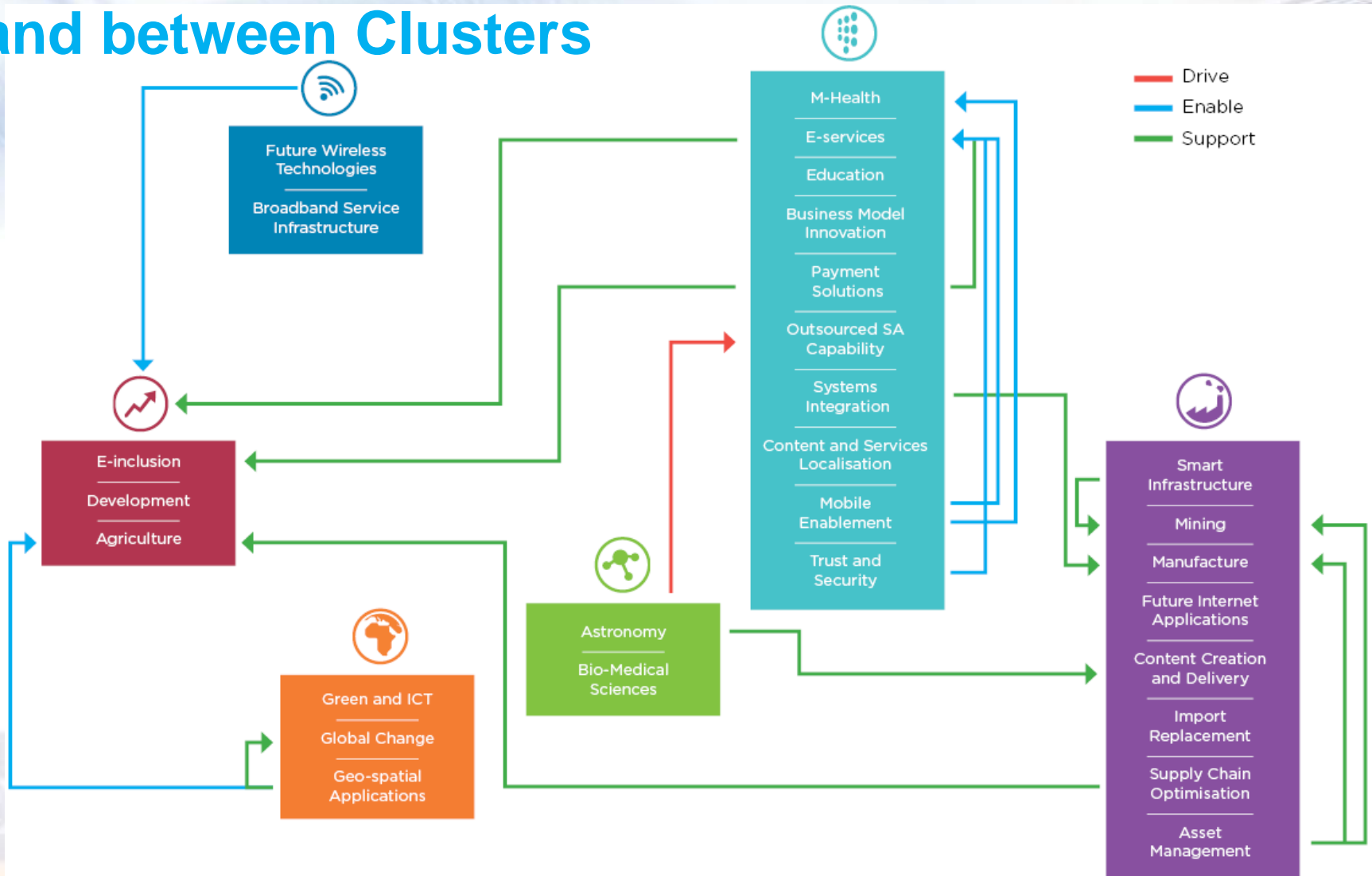
- ▶ Improved quality of basic education
- ▶ A long and healthy life for all South Africans
- ▶ All people in South Africa are and feel safe
- ▶ Decent employment through inclusive economic growth
- ▶ **A skilled and capable workforce to support an inclusive growth path**
- ▶ **An efficient, competitive and responsive economic infrastructure network**
- ▶ Vibrant, equitable and sustainable rural communities with food security for all
- ▶ Sustainable human settlements and improved quality of household life
- ▶ A responsive, accountable, effective and efficient local government system
- ▶ Environmental assets and natural resources that are well protected and continually enhanced
- ▶ Create a better South Africa and contribute to a better and safer Africa and World
- ▶ An efficient, effective and development oriented public service and an empowered, fair and inclusive citizenship

Investment Portfolio: Six Thematic Clusters for South Africa

A 6-point, Cluster-driven Strategy



Affinities exist between Market Opportunities and between Clusters



SA's ICT R&D and Innovation Landscape



science
& technology







Department:
Science and Technology
REPUBLIC OF SOUTH AFRICA

Mapping National ICT RDI Capability

	RDI Capability - Maturity		
	Faculty	Phd Students	Masters Students
0 Subcritical	Single faculty member	0 - 1	0 - 5
4 Emerging	Dedicated Professorship	1 - 5	5 - 10
7 Building	Research Chair or Centre of Excellence or Dedicated Professorship with small research group	5 - 10	10 - 20
10 Mature	Established Research Chair or Centre of Excellence with professors, senior lectures, lecturers and admin staff	>10	>20



10 Year ICT RDI Roadmap Investment and Impact

Investment			Impact over 10 years		
	Total to Exit ZAR M	MTEF 2013/15 ZAR M	Contribution to economy pa ZAR Bn	New Businesses created	Job creation
 Broadband Infrastructure and Services	800	70	12Bn+	5 medium 1200 micro-businesses/ operators	825 high-tech 2625+ other
 Development	596	52	21 Bn	3 medium 1000 micro-franchisees	1750 other
 Sustainability and the Environment	1,479	83	27.6 Bn	10 medium 55 small	1200 high-tech 6100 other
 Grand Science	1,016	53	6.7 Bn+	1 large 4 medium 5 small	450 high-tech 1800 other
 Industry Applications	3,394	52	52.2 Bn	15 medium 130 small	1750 high-tech 7200 other
 The Service Economy	2,101	33	Significant, but indirect	Significant, but indirect	Significant, but indirect
Office of Digital Advantage		19			
TOTAL	9,385	362	120Bn+	1 large 37 medium 190 small 2200 micro	4,225 high-tech 19,475 other

... and What Does this Investment buy?



science
& technology

Department:
Science and Technology
REPUBLIC OF SOUTH AFRICA

Build local ICT RDI capabilities and ramp-up for future export

Readiness

- ▶ Delivering broadband to 80% of South African citizens by 2020 to accelerate the attainment of Millennium Development Goals

[SA Former Communications minister, Dina Pule]

Capacity

Knowledge Generation

- ▶ Publications 1700
- ▶ Patent applications 120
- ▶ Registered Patents 42

Human Capital Development

- ▶ Masters 675
- ▶ PhDs 450
- ▶ Post Docs 225

Technology Development

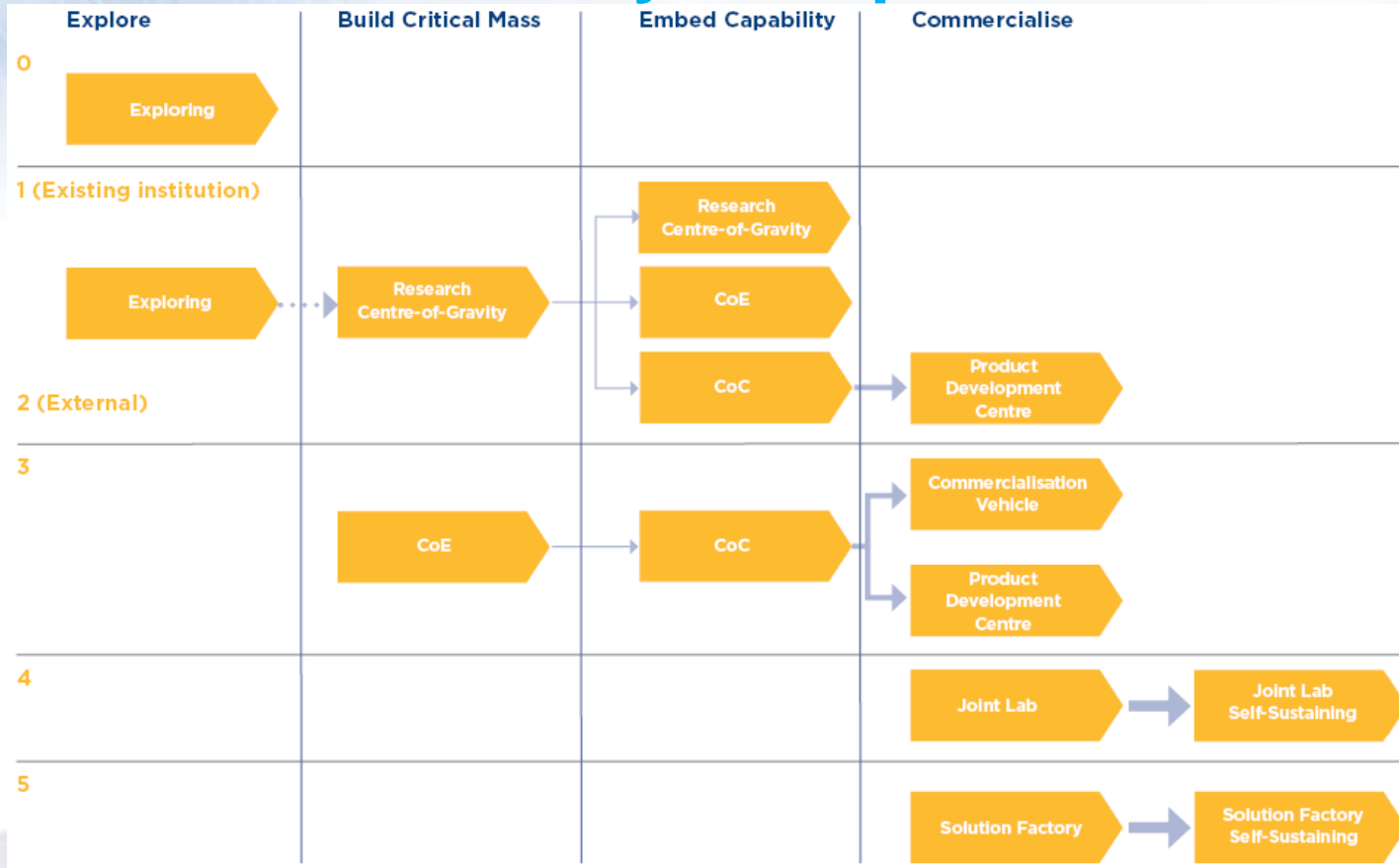
- ▶ Prototypes 470
- ▶ Technology Packages 124
- ▶ Products and services to market 40

Research Chairs 30

Use

- ▶ m-health **DoH - NHI**
- ▶ Astronomy (Data Science & Analytics) **SKA**
- ▶ Smart & Green Infrastructure **Green Economy**
- ▶ Geo-spatial applications **Global Change**
- ▶ ICT for Development **Poverty Alleviation**
- ▶ Broadband & Future Wireless Technologies **Knowledge Economy**

Progression Paths guide Interventions towards delivery of Impact




Each stage requires different mix of Instruments

Illustration

 HCD: Scholarships, courses, studentships, interns, supervision, research leadership

 Knowledge generation

 Technology Development


 RDI Infrastructure

 Partnership (PPP) and Collaboration

 Research Chairs (NRF)

 Centre of Competence (TIA)

 Seed funding

 Venture Capital



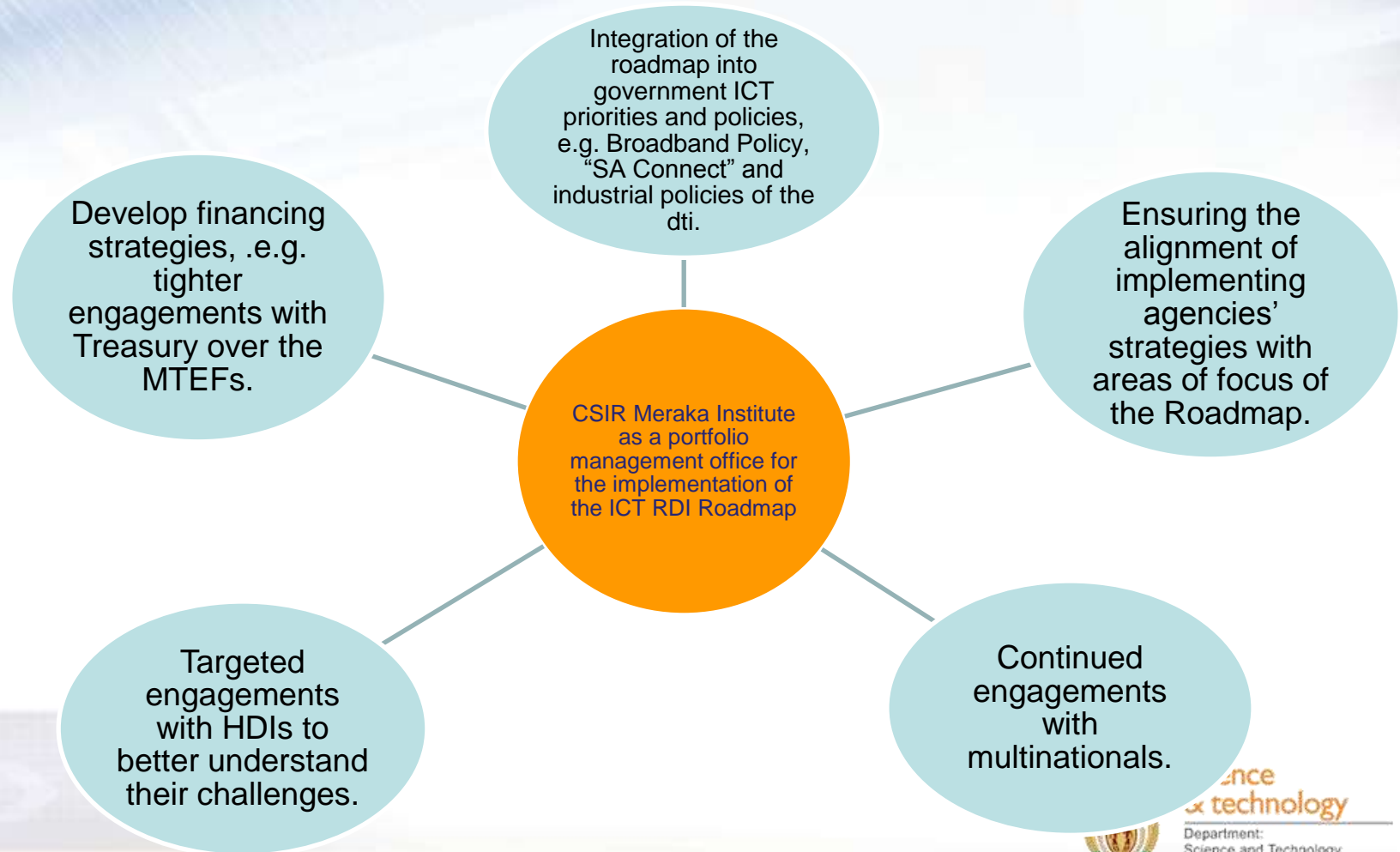
science
& technology
Department:
Science and Technology
REPUBLIC OF SOUTH AFRICA

... and How Do We Manage this Portfolio of Investment?



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

Office of the Digital Advantage








Sourcing Funding over and above MTEF baseline and ring-fenced allocation

- DBSA Green Fund for the development of an ICT Smart and Green Platform;
- Funding from the Department of Rural Development and Land Reform for the implementation of the Cofimvaba e-Textbooks initiative;
- The three year ICT Industry Innovation Partnership Fund from the National Treasury's Economic Competitiveness Support Package; and
- Funding from the European Union General Budget Support (GBS) by National Treasury for using ICT to support government service delivery.



Structured Engagement with International and Local Industry Partners

Priority Area	Partner
 <p>Broadband Infrastructure and Services</p>	CISCO Parsec IBM ZTE Microsoft Redline Communications Nokia Siemens Networks CellC MTN
 <p>Astronomy and Data Science</p>	IBM SDRI SAP Intel Microsoft
 <p>Development</p>	GSMA Cell Life GeoMed Mobenzi Hello Doctor mLab
 <p>M-Health</p>	ESKOM Tellumat
 <p>Smart and Green</p>	Sasol Absa ESKOM International Eskom equivalents NASA
 <p>Geo-Spatial and Global Change</p>	

Engagement Model	Partner
<i>Student / Researcher Exchanges</i>	▶ Google
<i>Early Access to Technology</i>	▶ Intel (MIC Chip)
<i>Joint Facilities</i>	▶ SAP, mLab
<i>Sharing Technical Know-How</i>	▶ DELL, Nokia Siemens Networks
<i>Joint Projects</i>	▶ Nokia, Microsoft, DiData
<i>Access to Expertise</i>	▶ Microsoft, IBM



Multinational ICT Companies Collaboration

Programme

Current



In Dialogue



Investment
Outcomes

DST /Microsoft
funding
contribution

DST /SAP
funding
contribution

DST/Nokia
funding
contribution

Equity
Equivalent

Equity
Equivalent ??

HCD: Student to
Business support
and Imagine Cup
HPC: Climate
Change model
TV White Spaces

Human Capital
Development
(MSc and
PhDs)

Open
Innovation
training



ICT RDI
Roadmap
areas:
- Analytics
- Smart and
Green ICT
- Mobile

ICT RDI
Roadmap
areas:
Broadband /
Fibre networks
and technology



science
& technology

Department:
Science and Technology
REPUBLIC OF SOUTH AFRICA

EU – South Africa Cooperation

- ▶ Create enabling national environment to support and promote researchers participation
- ▶ Other frameworks for SA cooperation with the EU:
 - EU Bilateral S&T Cooperation Agreements
 - Joint Science and Technology Cooperation Committee, thematic dialogues (e.g. Space, Information Society, KBBE, Energy)
 - Interface with multilateral frameworks (e.g. OECD, Carnegie Group, GEO, etc.)

Current EU-SA Cooperation in ICT

1. ICT FP7: 16 participations and 15 projects (221 overall participation in FP7 and over €50 Million)
2. Two SA Projects under the FIRE Call – Test beds for reliable Smart City M-to-M Communications and Mobile Empowerment for the Socio-Economic Development in South Africa
3. SA ICT Priorities for EU H2020
 - Trust and Security
 - Big Data and Cloud Computing
 - Smart Living
 - Robotics
4. NCP for ICT in Horizon 2020

Thank You

Tel: +27 12 843 6539

Email: peacemaker.dlamini@dst.gov.za

<http://www.meraka.org.za/ictroadmap/>



science
& technology

Department:
Science and Technology
REPUBLIC OF SOUTH AFRICA