

Annual Performance Plan 2014/15



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science
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Department:
Science and Technology
REPUBLIC OF SOUTH AFRICA

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foreword



This Annual Performance Plan (APP) sets out the path that the Department of Science and Technology (DST) will follow in the 2014/15 financial year to reach its strategic goals. Interventions are aligned to key government policies, including the Medium Term Strategic Framework 2014-2019, the New Growth Path, the Industrial Policy Action Plan and the National Development Plan.

Performance indicators and targets guide the allocation of the Department's budget (due to increase from R6,1 billion in the 2013/14 to R7,6 billion in 2015/16) and allow the public and its elected representatives in Parliament to measure the Department's effectiveness in carrying out its mandate.

In our quest to develop an enabling environment for the National System of Innovation (NSI) and to unlock the potential for economic growth through science, technology and innovation (STI), the APP addresses the need for human capital development and for the continuous modernisation of scientific infrastructure.

The Department started implementing some of the recommendations of the Ministerial Review Committee report on the STI Landscape in South Africa, as well as decisions adopted at the STI Summit held in Limpopo in July 2013. While the APP lays out the intentions for the coming period, these will largely build on and expand existing programmes.

Much of the work and research that we undertake supports Government's Outcome 2 (A long and healthy life for all South Africans) as well as Outcome 4 (Decent employment through inclusive growth). Thus research on malaria has culminated in the first-ever drug compound developed on African soil, and research into innovative water technologies, has been piloted in rural communities. In June 2013, the DST and the Council for Scientific and Industrial Research (CSIR) launched the Titanium Pilot Plant, a technology that has massive potential for job creation and industrial development.

The Department continues to play an advisory and supportive role in the development of technologies to be used in addressing the country's energy needs through the Integrated Energy Plan and Integrated Resource Plan.

During the 2014/15 financial year, the Department will finalise the strategy and implementation plan on Human Capital Development for Research Innovation and Scholarship. A total amount of R470,4 million has been allocated to fund postgraduate students in the 2015/16 reporting period with continued support to the DST-National Research Foundation (NRF) internship programme, to researchers, and to postgraduate students up to doctoral level.

Five more centres of excellence (CoEs) have been announced and will be operationalised in 2014/15, bringing the total number of CoEs across the country to 14. These Centres have proven to be instrumental in stimulating sustained excellence in research, while generating highly qualified scientists that have an impact on national and global research knowledge.

For the 2014/15 to 2016/17 financial years R3,185 billion has been allocated for science and technology infrastructure. This excludes a substantial allocation for the South African Square Kilometre Array (SKA) Project of R2,053 billion over the MTEF period. By the beginning of the 2014/15 financial year, construction of the first dish of the 64-dish precursor to the SKA, the MeerKAT, will be completed, and by the end of 2016 this radio telescope will be fully operational. It will be the most powerful radio telescope in the world until the SKA becomes operational.

The Department's efforts are enhanced by international partnerships and collaboration with other countries and global organisations. A recent highlight was the first Brazil, Russia, India, China and South Africa (BRICS) STI Ministerial Meeting in February 2014. Bilateral cooperation agreements with these and many other countries have seen the development of strong institutional collaboration, and a large number of joint research projects.

The Department plans to escalate this international cooperation, strengthening the STI engagement with other African countries and ensuring that South African researchers and students have access to international scholars and opportunities.

The achievement of a knowledge-based economy that is able to realise the aspirations of our people will depend on the commitment and cooperation of all our stakeholders in government, academia, business, industry and civil society. We are committed to strengthening the strong spirit of cooperation that we already have with all our stakeholders throughout the MTEF period and beyond. In so doing, we can jointly ensure that our work in science and technology makes a real difference in improving the lives of all our citizens.



MR DA HANEKOM, MP
MINISTER OF SCIENCE AND TECHNOLOGY

official sign off

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Acting Chief Financial Officer

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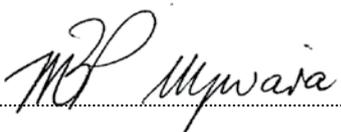
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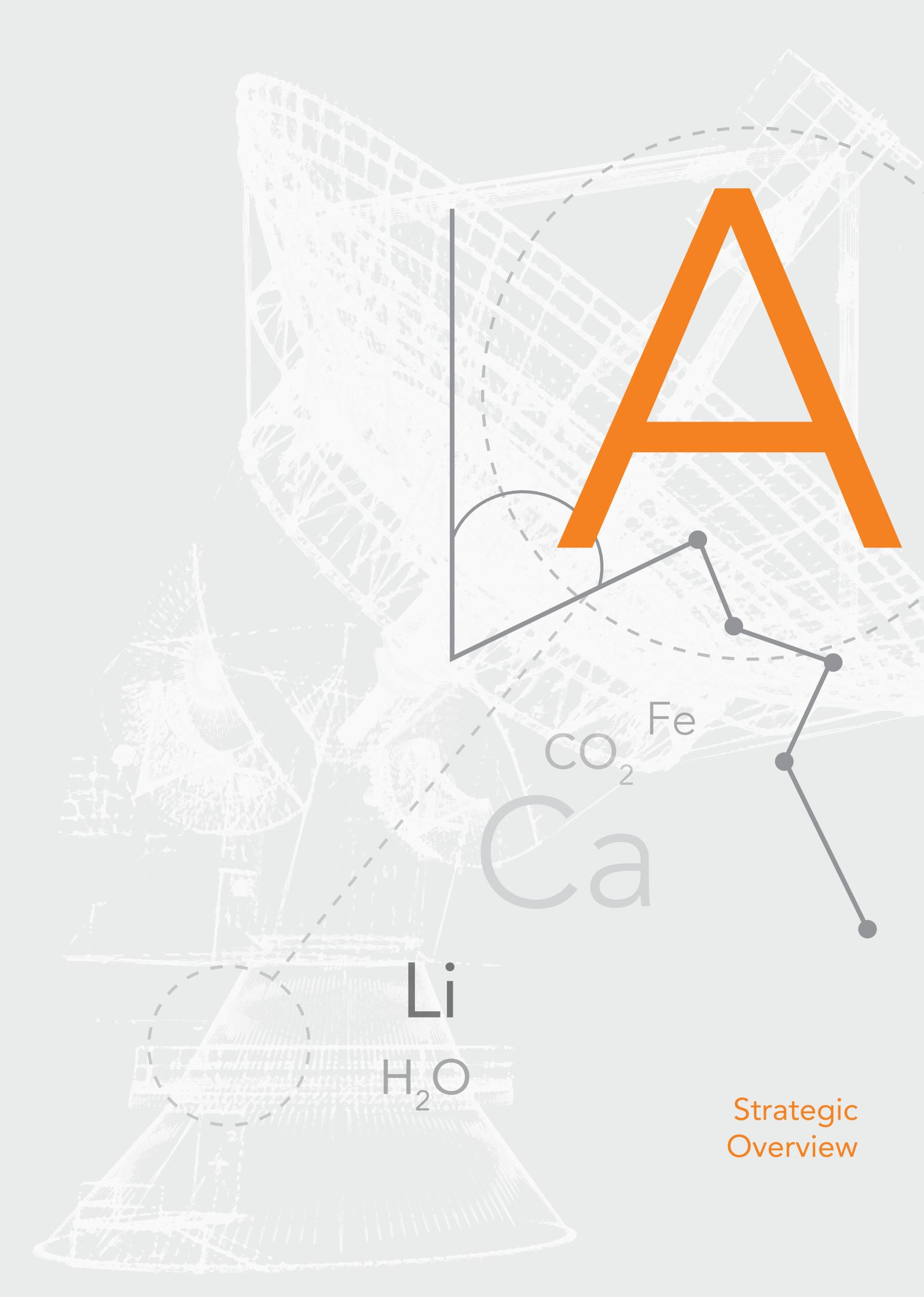
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Strategic
Overview



Part A

STRATEGIC OVERVIEW

1. VISION

To create a prosperous society that derives enduring and equitable benefits from science and technology.

2. MISSION

To develop, coordinate and manage a National System of Innovation that will bring about maximum human capital, sustainable economic growth and improved quality of life for all.

3. UPDATED SITUATIONAL ANALYSIS

The Department of Science and Technology (DST) followed its planning cycle framework in managing the process of developing its 2014/15 Annual Performance Plan (APP), which is aligned to the broad policies of government such as the National Development Plan and the draft 2014-2019 Medium Strategic Term Framework. The process entailed a series of consultations starting with the Department's Executive Committee (EXCO) considering the approach and steps that would be undertaken in developing the APP, taking into account national and international trends identified and a performance review based on the 2012/13 DST annual report, and second and third quarterly reports for 2013/14 financial year.

The Department's Programmes reviewed the 2011-2016 DST strategic plan and gave their input into the 2014-2019 Medium Term Strategic Framework. The Programmes presented their contribution to the 2014/15 APP at a Minister's strategic planning session, on the focus and priorities of the Department for the next five years.

The draft 2014/15 APP was also presented at various senior management forums within the Department, including EXCO, Extended EXCO and the Minister's Management Meetings. Further consultations were conducted with other organs of government such as the National Treasury (for budget alignment) and the Department of Performance Monitoring and Evaluation in the Presidency (DPME) (for alignment with the 2014-2019 MTSF).

3.1 Performance delivery environment

The DST derives its mandate from the 1996 White Paper on Science and Technology, which introduced the concept of the NSI. The NSI concept is an enabling framework for development of science, technology and innovation (STI) at national level. The NSI can be understood as a set of functioning institutions, organisations and policies that interact constructively in the pursuit of a common set of social and economic goals and objectives, seeking to promote change through the introduction of innovations.

The DST, as the custodial coordinator for the development of the NSI influences it through key strategies such as the 2002 National Research and Development Strategy (NRDS) and the 2008 Ten-Year Innovation Plan (TYIP). The latter, particularly, seeks to contribute to the transformation of the South African economy into a knowledge-based economy, in which the production and dissemination of knowledge lead to economic benefits and enrich all fields of human endeavour. In this regard, the measure of success will be the level to which STI play a driving role in enhancing productivity, economic growth and socio-economic development.

Innovation, in particular, will be the basis of future growth and can provide South Africa with the necessary foundation for long-term and sustainable socio-economic development. One of the eight proposals that the NDP makes with regard to increasing employment and growth is that South Africa must increase the size and effectiveness of the innovation system, and ensure closer alignment with companies operating in sectors consistent with the growth strategy.

Innovation has been attributed to productivity growth, competitiveness, the shift to higher value-added activities, and improvement of quality of life in the recently industrialised countries (such as South Korea and Finland) and emerging economic powers (China, India and Brazil). Innovation introduces new ways of doing things, and producing and exchanging goods or improving services and processes. It provides new solutions and helps firms to differentiate themselves from other, often more traditional firms. Innovation challenges long-held mindsets and social values. Innovation is central to economic performance and social welfare, and can contribute to addressing urgent global and social challenges such as climate change, health, food security, poverty and access to clean water) in an affordable and timely manner.

The global economic crisis and national challenges of inequality, poverty and unemployment have affected the national innovation policy agenda in various ways. There is increasing demand for STI to maximise its impact on socioeconomic development and conserving resources. The national STI policies are expected to be relevant (to address socioeconomic goals), aligned (with each other and with other policies), and inclusive in terms of scope and of the concerned actors.

Despite the recent global economic turmoil, countries continue to recognise innovation as a source of long-term growth, and have put policies into place to improve scientific infrastructure, basic science and research, development and innovation (RDI), to strengthen human capital, to promote green technology, and to foster entrepreneurship. Stimulus packages have also provided additional support to science and innovation amounting to between 0,01% (Finland and Norway) to 0,29% of gross domestic product (GDP) (Sweden) in 2009.

Across the world, in response to increasing rates of knowledge production, dissemination and application, shortening of product life cycles and increasing competition for human resources, many countries are increasing their national investment in R&D. The Organisation for Economic Cooperation and Development (OECD) average across public and private sectors is 2,3% of GDP, and countries such as Finland and Korea spend far more. South Africa's level of 0,76% in 2011/12 was significantly lower than it should be to ensure global competitiveness in years to come. For instance, Finland had intended to raise its GERD to 4% of GDP by 2010. Korea had intended to raise its GERD to 5% of GDP by 2012 and India to 6% by 2015.

In developed countries more than 50% of economic growth is attributable to technological progress (Organisation for Economic Cooperation and Development, 2009). South Africa is competitive in many areas, but has specific challenges that require interventions. These include the following:

- Achieving critical mass in a small number of long-term, large-scale high-impact priority areas that have been identified over the past few years.
- Ensuring that high-level human capital is developed and employed in long-term productive research careers in South Africa.
- Introducing and strengthening efforts that enhance South Africa's ability to exploit knowledge effectively for economic and social benefit.
- Improving the ability of government investment to leverage private sector and international funding.
- Building the knowledge-generation and knowledge-exploitation capabilities of rural and historically disadvantaged HEIs.
- Providing and maintaining state of the art STI infrastructure.

- Creating a coordinated and integrated NSI governance and robust monitoring and evaluation (M&E).
- Developing and strengthening of regional and provincial innovation systems and capabilities to meet community and industry demands.
- Using the cluster system to facilitate alignment of the DST programmes to the New Growth Path (NGP) and Industrial Policy Action Plan (IPAP) and National Development Plan (NDP).
- Resourcing of the system by achieving and going beyond the 1% Gross Expenditure on Research and Development (GERD) as a % of GDP.

3.2 Alignment to broad policies of government

The NDP provides a long-term vision for dealing with the challenges of unemployment, inequality and creating a more inclusive society. Central to meeting the vision enshrined in the NDP is the implementation of the NGP, the IPAP and the National Infrastructure Plan. These short and medium term plans provide a more detailed programme of action in the context of the NDP for the next five years.

The MTSF places emphasis on addressing unnecessary blockages to investment; providing opportunities for the unemployed, especially young people, to contribute to the economy; ensuring greater income equality by addressing the position of the working poor (who are mostly in domestic work, farm labour and the informal sector), supporting more equitable workplaces and increasing investment in new sources of growth and employment. Achieving this aim will depend to a large extent on the following:

- Implementation of the National Infrastructure Plan in ways that crowd in productive investment both by users of the infrastructure and by suppliers of inputs.
- Driving growth in the productive sectors and the other priority jobs drivers identified in the NGP, especially by addressing the main regulatory, infrastructural and skills constraints on growth while ensuring policy certainty as far as possible, through the implementation of IPAP and similar sector-based action plans for agriculture and mining.
- Supporting exports and African regional development, taking into account the constraints as well as the opportunities arising from the structural shifts now taking place in the global economy.
- Maintaining a counter-cyclical fiscal and monetary stance.
- Improving the ability of the education and skills systems to meet the needs of the economy, especially by enhancing language, numeracy, computer and design skills, improving access to post-secondary education and training, and expanding life-long learning in ways that support career mobility and equality.
- Expanding public employment schemes as far as possible in ways that empower communities and support the involvement of youth in serving them.
- Supporting rural development as far as possible given economic realities, based above all on programmes to expand the role of small holding in production for both food security and sale to formal retailers and processors.
- Strengthen the ability of the NSI to identify, prioritise, and adequately invest in new sources of growth and employment including higher levels of government investment in RDI and diffusion especially to smaller emerging enterprises and poor communities.

The DST will play an important role in the implementation of the MTSF and realisation of its objectives. The Department continues to implement specific national STI policies that are guiding and influencing its work, including the NRDS, the TYIP, and the Bio-economy Strategy.

3.3 Recent achievements

3.3.1 Knowledge generation

(a) Human capital development and knowledge production

In trying to address the human capital shortages in the country, the Department supported a total of 3 076 researchers during the 2012/13 financial year. In addition to this, through bursary programmes managed by the National Research Foundation (NRF), the Department funded 8 379 postgraduate students at honours, master's and doctoral levels. Through the DST-NRF internship programme, the Department supported 711 interns during the 2012/13 financial year. One of the purposes of the internship programme is to retain science, engineering and technology (SET) graduates in the science system through placement in various institutions in the NSI, thereby improving their employability.

There are a number of instruments that are designed to strengthen research capacity at universities, including the South African Research Chairs Initiative (SARChI) and Centres of Excellence (CoEs) programmes, both managed by the NRF. By the end of the third quarter of the 2013/14 financial year, a total of 47 of the 62 new research chairs awarded in the 2012/13 financial year had been filled. A document on the three models for international research chairs (International Visiting Research Fellow, Bilateral SARChI Chair, and Bilateral Research Chair) was approved by the Minister. A phase 1 call for applications to host the first Swiss-South Africa bilateral research chairs, for Global Environmental Health and Science Communication, was opened and closed during the third quarter of 2013/14. A five-year review of SARChI aimed at assessing the overall programme was completed in the third quarter of the 2013/14 financial year by an international panel.

The NRDS identified the need to create centres and networks of excellence in S&T. These are physical or virtual centres of research which concentrate existing capacity and resources to enable researchers to collaborate across disciplines on long-term projects that are locally relevant and internationally competitive in order to enhance the pursuit of research excellence and capacity development. These centres are envisaged to be a key resource for human capital development and to stimulate sustained distinction in research while generating highly qualified scientists to impact significant national and global areas of knowledge. By the end of the 2013/14 financial year five new CoEs had been awarded, in addition to nine existing ones.

(b) Research infrastructure

On the infrastructure development front, a highlight was the award to host over 70% of the Square Kilometre Array (SKA) radio telescope in South Africa and its eight partner countries (Ghana, Kenya, Mauritius, Zambia, Madagascar, Mozambique, Botswana and Namibia). This will create massive infrastructure and job creation opportunities for the African continent. The remaining 30% of the SKA will be hosted by Australia.

As part of its continued support for research and innovation infrastructure, ring-fenced DST funding made it possible to award 53 research infrastructure grants to the research community across the country during the 2012/13 financial year. Most of the funding was allocated to universities, science councils and museums through the National Equipment Programme (NEP) and the National Nanotechnology Equipment Programme (NNEP), both implemented by the NRF. Infrastructure funds were also used for the development of various initiatives such as a titanium primary pilot plant, a world class nanotechnology development clean-room at Mintek and the establishment of the National Recordal System (NRS) to capture, store and manage indigenous knowledge. For the 2013/14 financial year up to the end of the third quarter, noteworthy highlights and achievements were the completion of two important reports, namely (i) the final report for the development of a South African research infrastructure roadmap and (ii) the final report on recommendations for the development of a national integrated cyberinfrastructure system.

3.3.2 Knowledge exploitation

(a) New industry development

New industry development on the basis of novel or promising technologies requires many years to develop and is accompanied by significant levels of risk and uncertainty. In particular, significant time is required during the process of scaling-up a successful technology in the laboratory to a semi-commercial operation. Over the last decade, considerable progress has been made in scaling-up a breakthrough innovation in the production of titanium powder. The technology is now being optimised and developed at a pilot-plant launched in June 2013 at the Council for Scientific and Industrial Research (CSIR). This is a milestone in the development of the titanium metal powder and it is essential to verify the processes required to up-scale the production. The first batch runs are planned to be completed by February 2014.

Similar progress has been made in the Fluorochemicals Expansion Initiative with the launch of a third and fourth phase of a multipurpose fluorination plant at South African Nuclear Energy Corporation (Necsa) in December 2013. The pilot plant will help to mature the fluorochemical research and associated processes, and will enable the production of small test samples, essential to test the commercial market and development partners.

The Aeroswift programme, the DST-funded investment in the next generation of additive manufacturing technology, executed by Aerosud and the National Laser Centre at the CSIR has progressed well. The construction of the prototype machine is near completion and the first test samples will be manufactured by March 2014. This development, together with the roadmap for additive manufacturing in South Africa, will help ensure that South African industry remains at the forefront of this new manufacturing capability, which is expected to have substantial impact on existing manufacturing processes and technologies.

(b) Economic competitiveness enhancement

In terms of enhancing the economic competitiveness of South Africa, the TYIP identified specific “grand challenges” in areas where South Africa had/or showed potential to be a source of competitive advantage. These fields included Energy Security, Space Science and the Bio-economy.

The Department supports R&D work in hydrogen and fuel cells and renewable energy technologies including concentrated solar, photo-voltaic, wind and bio-energy based technologies. These technologies can be used for both on and off-grid applications. The achievements over the last few years include the establishment of the three Hydrogen South Africa (HySA) Centres of Competence (CoCs), in terms of the Hydrogen and Fuel Cell Research Development and Innovation Strategy. The first five years (2008 to 2012) of the HySA programme focused on the establishment of R&D capability, technology demonstration and validation. The following are some of HySA’s achievements to date:

- Since 2009, a total of 47 students have graduated from the programme, with 15 PhDs and 32 master’s degrees.
- The first proton exchange membrane fuel cell high-temperature stack and bipolar plates were manufactured in South Africa with local and key international manufacturers.
- The first 2.5 kW fuel cell backup power system prototype in South Africa was manufactured for the telecommunication and uninterrupted power system markets.
- The first high-temperature membrane electrode assembly fuel cell electrodes manufacturing line in South Africa was set up in collaboration with a local engineering company and a renowned international partner.
- Metal hydride storage material for hydrogen has been demonstrated in the hydrogen powered Ahi Fambeni tricycle and the golf cart. The patent was developed at University of the Western Cape. A co-commercialisation agreement is in place with a Norwegian partner.

- A collaboration between HySA Systems and Melex Electro-vehicles has led to the development of a golf cart with an extended range of 70km (depending on the terrain) powered by a hydrogen fuel cell unit.
- HySA Catalysis has developed a catalyst with performance that is comparable to the commercially available standard. Validation and testing of the catalyst in collaboration with HySA Systems is currently underway.

Another achievement is the establishment of the Advanced Batteries R&D Programme. Currently, the Department has invested in human capacity and infrastructure building through the Lithium Ion Battery and Supercapacitor programme. The programme aims to develop manufacturing capabilities and electrode materials for various applications. The achievements of the programme to date are as follows:

- Installation of a pilot battery cell manufacturing facility, capable of producing 10-20 Ah pouch cells and 18,650 cylindrical cells at the University of the Western Cape.
- Establishment of a testing and validation facility at the Nelson Mandela Metropolitan University.
- Generation of intellectual property (IP) in battery cell chemistry, in which UWC was awarded a USA patent during the 2012/13 financial year.

The DST supported an R&D programme at the Nelson Mandela Metropolitan University, which successfully developed Coalgae™, a blended bio-fossil fuel of coal fines and microalgae. This product has a biomass content varying from 10 to 40 % and is a competitor to coal. South Africa currently has 1 billion stockpiles of fine coal with low or no value, which accrues at a rate of 60 million tons per annum. Coalgae™ increases the calorific value and reduces the ash content, thus making the product competitive to export and synthetic fuels coal. SunGeo, which focuses mainly on solar energy resource quantification, was established as a spin-off company of the renewable energy hub in partnership with a Slovakian-based enterprise.

In support of the Department of Energy's commitment to install an additional 9.6GW of nuclear power by 2030, the Department is currently supporting HCD in nuclear energy through the South African Nuclear Human Asset Research Programme (SANHARP) in partnership with the NRF. A draft Nuclear Energy Research Development and Innovation Strategy (NERDIS) was also developed during the 2012/13 financial year with the following key objectives:

- To contribute to the establishment of the knowledge and skills base required to support the expanded use of nuclear energy in South Africa, specifically those advanced competencies which are developed through RDI activities.
- To increase the local content of the SA nuclear energy programme through directed research, development and product or process innovation.
- To maintain an appropriate footprint in the international nuclear community through participation in RDI activities of relevance to South Africa.

The DST established the South African National Space Agency (SANSA), which was formally launched in December 2010. SANSA is fully operational and its role is to play a central coordinating role in the space arena. Currently, the DST and SANSA are working together with all stakeholders to fine-tune the National Space Programme (NSP), to incorporate all the recommendations of the space capabilities audit, and to drive South Africa's space industry development and the progress towards a knowledge-based economy through human capital development, knowledge generation and exploitation, knowledge infrastructure development and, ultimately, a space programme which responds to the socio-economic challenges faced by South Africa.

The DST has conducted two feasibility studies for setting up a CoC on Satellite Sensors and Data Processing. Work on the CoCs is ongoing with relevant agencies, and the proposals will be finalised during the 2014/15 financial year. The Launching Capability report will also be finalised in the 2014/15 financial year, paving the way for the 20 year national launching plan as a response to the TYIP.

The first South African government funded satellite development programme saw the locally designed and built satellite, SumbandilaSat successfully launched on 17 September 2009 from Baikonur, Kazakhstan. This programme offered a number of success stories in HCD (8 interns, 1 PhD, and 17 master's), innovation and knowledge generation, and a significant outreach and awareness activities across the country.

In the area of bioeconomy, the National Biotechnology Strategy (2001) defined a broad institutional approach towards the development of biotechnologies for South Africa. The prime focus was on the commercialisation of technologies that had reached the proof-of-concept stage, and the expected outputs were products, services and new companies. In terms of this Strategy, in excess of 221 products and 142 services were developed by 2009 through the support provided by the Biotechnology Regional Innovation Centres. New capacity, infrastructure and value chains have been built and experience gained in the application of biotechnology to a range of areas from new diagnostics to improved crops and livestock. It was against this context that the Bio-economy Strategy was developed and launched in January 2014. The Bio-economy Strategy was designed to complete the cycle, by amalgamating the experiences, expertise and competitive advantages gained to create a world-class biotechnology system of innovation. This system would operate at a much higher level than mere project support, and is more productive, responsive and relevant to the needs of South Africans. The Bio-economy Strategy also incorporates the largely underexploited Bio-based Indigenous Knowledge Systems (IKS), and builds on the R30 million invested in supporting 25 applied research projects and together with two IKS research chairs supported 12 PhD, 31 master's, and 40 Honours students.

Through NIPMO, the following key achievements were also made in terms of the IPR-PFRD Act:

- Offices of Technology Transfer (OTTs) were established at 23 South African universities and 10 statutory science councils (collectively referred to as institutions).
- Funding capacity was developed at the OTTs (through the placement of suitably qualified and experienced individuals in the OTTs).
- Researchers at institutions received basic IP advocacy and awareness training (*IP Wise™*).
- Intellectual Property & technology transfer capacity in the NSI was developed through support for the NIPMO/UNISA IP Chair that was established to develop master's and doctoral level courses in IP management and technology transfer and through IP commercialisation workshops and the World Intellectual Property Organisation (WIPO) Summer School.
- The IP Fund was established and is providing funding for the IP prosecution phase (filing costs), as well as the maintenance costs incurred in protecting IP emanating from publicly financed R&D at institutions.
- A feasibility study was carried out on the establishment of NIPMO as a specialised service delivery unit (SSDU) of the Department with assistance from the National Treasury's Technical Assistance Unit. .

Additional funding received from National Treasury was directed towards the Technology Localisation Programme to support increased national competitiveness and local production. The technology assistance packages (TAPs) provided to industry in support of local capability building has yielded concrete opportunities to expand markets and create jobs. The expanded internship programme, rolled out in February 2014, placed interns at technology stations or firms participating in the TAP programme. An example of a TAP intervention is where Powertech Transformers received support from the University of Pretoria to develop a design tool for the mechanical behaviour of a transformer coil in the event of failure. PowerTech Transformers was subsequently able to develop a range of small transformers that will be manufactured locally, through a dedicated manufacturing line. Besides the increase in knowledge and design capability, the TAP led to the creation of 30 direct jobs.

R40 million was disbursed to the technology stations which are important mechanisms for supporting technology development, knowledge transfer and capability building for local industry, with a particular emphasis on small and medium enterprises. Seventy

percent of the funding was used for upgrading capital equipment in order to ensure that the technology stations had continued access to modern equipment in support of industry technology transfer.

(c) Social and public good

Technology and science-based knowledge are vital in supporting improved outcomes in areas ranging from employment creation opportunities and the building of sustainable human settlements to health and education. Through a large-scale implementation of a Wireless Mesh Network (WMN), the DST has demonstrated how lower-cost internet connectivity can be provided to hard-to-reach communities. The experiences of the WMN have informed the Broadband Strategy adopted by Cabinet in December 2013. Information communication technology (ICT) is becoming an increasingly crucial requirement for a modern education system able to deliver 21st century skills to learners and to facilitate inclusion of marginalised groups. The building blocks for a large-scale initiative looking at how ICT can support rural education were put in place in Cofimvaba in the Eastern Cape.

In terms of work undertaken by the Department With regard to health innovation, close to 50% of the National Bio-economy Strategy budget was also invested in human health research and innovation initiatives. This was complemented by the direct investment of the Department under the "Framework for Science and Technology Interventions in Health Innovation". These health innovation initiatives included the development of programmes aimed at addressing, amongst others, HIV/AIDS, TB, malaria and non-communicable diseases, and the creation of facilities and infrastructure enabling aspects of health innovation (medical devices, Centres of Competence and pre-clinical facilities). Achievements under these programmes included the clinical trials of the Tenofovir gel (against HIV transmission), the discovery of HIV broadly-neutralising-antibodies (as a key component of a possible AIDS vaccine), the development of a single-dose anti-malarial drug candidate, and the development of Umbiflow™ Doppler medical device that is used for antenatal screening.

Approximately R65 million has also been invested in IKS-related projects in terms of the new IKS Research Management Model, and the Bioprospecting and Product Development Platform. Five established flagships projects (African traditional medicines, cosmeceuticals, nutraceuticals, health teas and Moringa technology transfer) have resulted in over 30 prototypes and candidate products (four traditional medicines, five cosmeceuticals, ten nutraceuticals, eight Moringa and three health teas). Commercialisation models used for these products ranged from licensing and spin-off enterprises to cooperatives and trusts. Both local companies (Afrilex, Kalahari and Amka) and international companies. (L'oreal and Nestle) have indicated interest in the commercialisation of these products.

(d) Decision support interventions for government

An important area of focus for the DST is to stimulate the development of decision-support tools that will facilitate informed decision-making based on the best available scientific knowledge, appropriately packaged for users. Two notable successes have been the developmental of an information technology-based spatial and temporal tool known as STEPSA, to support spatial planning in South Africa. Similarly, a platform to support responses to environmental changes known as the Risk and Vulnerability Atlas has matured as a tool for local-level planning.

In the energy sector, the Department is developing the Energy Research Development and Innovation Strategy (ERDIS), and the relevant implementation instruments, in order to meet the country's national energy needs. The ERDIS is a coherent portfolio of programmes relating to energy generation, delivery, consumption and storage. The execution and management of the (R&D) programmes is performed by state-owned entities (SOEs) and agencies, such as the South African National Energy Development Institute (SANEDI), the Technology Innovation Agency (TIA), the South African Nuclear Energy Corporation (Necsa), and the science councils and the universities. Socio-economic benefits will be derived from the commercialisation of the R&D outcomes generated by the implementation agencies, resulting in the improvement of the quality of life for all South Africans.

The Department, in collaboration with the Department of Energy, funded the Energy Efficiency and Demand Side Management (EEDSM) hub at the University of Pretoria. The objectives of the hub are to guide R&D activity, promote technology development and diffusion, and build capacity and capability. During the 2012/13 financial year, the Department conducted a study in terms of the South Africa/Japan Energy Efficiency Improvement Project, in collaboration with the DoE, the Department of Trade and Industry and the Japan International Cooperation Agency. The study proposed a system, framework and policies for improving energy efficiency in the energy sector and identified the human capital gap.

In the Space Science arena, the South African Earth Observation Strategy (SAEOS), was developed and officially launched in November 2007 in response to the need to coordinate the collection, assimilation and dissemination of Earth observations so that they could be optimally used to support policy, decision making, economic growth and sustainable development. SAEOS is part of South Africa's contribution to the Group on Earth Observation System of Systems (GEOSS), an initiative of the Group on Earth Observation (GEO). SAEOS will form the national node for GEOSS. SAEOS includes a SAEOS portal, a user-orientated entry point for data discovery and access which is accessible through the internet, and the Earth Observation Data Centre (EODC), which acquires, processes, archives and distributes space information and products. The SAEOS Portal and EODC are fully functional, and they are continuously enhanced and refined by introducing new extensions to improve their performance and functionality. SANSA plays a key coordinating role and acts as the implementer of the SAEOS and National Space Strategy (NSS). The DST has also invested in applied remote sensing and geo-informatics research to develop advanced and operational applications, products and services in support of the implementation of SAEOS.

Furthermore, the DST successfully established the National Earth Observation and Space Secretariat (NEOSS) office in 2011. NEOSS provides a cooperation platform for communities of practice in earth observation (EO), satellite communication, navigation and space exploration. NEOSS is fully operational with communities of practice in infrastructure, water, agriculture, air quality, landcover change and natural resources. The Department is working on the development of the second forum on satellite navigation, which will coordinate the work done on navigation and positioning (e.g. the extension of the European Geostationary Navigation Overlay Service) by the DST, the Department of Transport (DoT) and its entities, and the Department of Communication (DoC). NEOSS's operational model will be reviewed soon to ensure that it performs optimally and is sustainable.

The initial work on the ZA-ARMC1 satellite, which is South Africa's satellite contribution to the African Resource Management Constellation, has proceeded with the verification of user specifications and finalisation of the satellite engineering and human capital development plans. Engineering work on the satellite is scheduled to commence in the early part of the 2014/15 financial year. The Cabinet's recommendation to absorb SunSpace's core capability into SANSA was implemented during the latter part of 2013. This was done by absorbing SunSpace's core capability into Denel Dynamics (DD) to establish a national satellite manufacturing capability. This positive decision has provided an additional impetus for the development of the ARMC constellation, which is a partnership between Algeria, Kenya, Nigeria and South Africa to establish a constellation of satellites and share data from earth observing satellites deployed by each of the partners in order to provide an information base for environmental monitoring and management.

3.4 Organisational environment

Three agencies (the National Research Foundation, the Technology Innovation Agency and the South African National Space Agency), two science councils (the Council for Scientific and Industrial Research and the Human Sciences Research Council), the National Advisory Council on Innovation, the Academy of Science of South Africa and the South African Council for Natural Scientific Professions are accountable to the Ministry of Science and Technology through the Department.

In addition to the agencies and research councils that report to the DST, there are several other science councils under other line departments, such as the Agricultural Research Council, the Medical Research Council, and the Water Research Commission. In principle, the coordination function of the DST with respect to these councils is outlined in the Strategic Management Model for South Africa's science and technology system (2004), and in practice there are several operational links to these councils. This Strategic Management Model was intended to clarify the respective functions of the Department and the relevant line departments; in this context the model was conceptualised as a driver or framework for coordinating the National System of Innovation.

Internally, the Department has reorganised its structure to respond to the recommendations and findings of various review reports such as the Ministerial Review Committee report on the STI landscape in South Africa, and currently comprises the following programmes:

- Programme 1: Administration.
- Programme 2: Technology Innovation.
- Programme 3: International Cooperation and Resources.
- Programme 4: Research Development and Support.
- Programme 5: Socio-Economic Innovation Partnerships.

The Department commits itself to continuous improvement in the policies, processes, structures and instruments that have been put in place in pursuit of an effective NSI whose contribution to national development is being optimised. The Department will also implement some of the recommendations of the Ministerial Review Committee, especially those related to governance, funding and monitoring and evaluation of the NSI.

As part of its knowledge generation initiatives, the Department and its public entities will continue to scale up and deepen the implementation and monitoring of successful programmes such as HCD initiatives like CoEs and research chairs. The Department will also support knowledge exploitation through entities such as the National Intellectual Property Management Office (NIPMO) and the Technology Innovation Agency (TIA).

3.5 Linking Programme objectives to the DST outcome-oriented goals

Table 1: Linking strategic outcome orientated goals with strategic objectives

DST STRATEGIC OUTCOME ORIENTATED GOALS	PROGRAMME STRATEGIC OBJECTIVES
<p>To develop the innovation capacity of the NSI and thereby contribute to socio-economic development.</p>	<ul style="list-style-type: none"> • To secure foreign STI funds to stimulate knowledge production, technology transfer, and enhanced innovation and STI human capital development in pursuit of STI-based socio-economic development in South Africa. • To identify, grow and sustain niche high-potential STI capabilities for sustainable development and the greening of society and the economy. • To identify, grow and sustain niche high-potential STI capabilities that improves the competitiveness of existing and emerging economic sectors and that facilitates the development of new targeted industries with growth potential in aerospace, advanced manufacturing, chemicals, advanced metals, mining and ICTs. • Through knowledge, evidence, and learning, to inform and influence how science and technology can be used to achieve inclusive development. • To lead, inform and influence policy development in areas of strategic science and technology innovation focus • To oversee, monitor and regulate key policy instruments, including institutional arrangements and support interventions in the key strategic areas of Space Science, Energy, Biotechnology, Nanotechnology, Robotics, Photonics, Indigenous Knowledge Systems, Intellectual Property Management, Technology Transfer and Technology Localisation. • To promote public engagement on science, technology and innovation. • To enhance understanding and analysis that support improvements in the functioning and performance of the National System of Innovation (NSI).
<p>To enhance South Africa's knowledge-generation capacity in order to produce world-class research outputs and turn some advanced findings into innovation products and processes.</p>	<ul style="list-style-type: none"> • To contribute to the development of representative, high level human capital able to pursue locally relevant, globally competitive research and innovation activities. • To support and promote research that develops basic sciences through production of new knowledge and relevant training opportunities. • To identify, grow and sustain niche high-potential STI capabilities that improves the competitiveness of existing and emerging economic sectors and that facilitates the development of new targeted industries with growth potential in aerospace, advanced manufacturing, chemicals, mining, advanced metals and ICTs. • To identify, grow and sustain niche high-potential STI capabilities for sustainable development and the greening of society and the economy. • To strategically develop priority science areas in which South Africa enjoys a competitive advantage, by promoting internationally competitive research and training activities and outputs.
	<ul style="list-style-type: none"> • To coordinate and support research and high-end skills development in the strategic and emerging Science and Technology areas of Space Science, Energy, Biotechnology, Nanotechnology, Robotics, Photonics, Indigenous Knowledge Systems, Intellectual Property Management, Technology Transfer and Technology Commercialisation. • To support, promote, and advocate for the development and translation of scientific research and development outputs into commercial products, processes and services that will contribute towards economic growth and a better quality of life.

DST STRATEGIC OUTCOME ORIENTATED GOALS	PROGRAMME STRATEGIC OBJECTIVES
<p>To develop appropriate STI human capital to meet the needs of society.</p>	<ul style="list-style-type: none"> • To contribute to the development of representative, high level human capital able to pursue locally relevant, globally competitive research and innovation activities. • To identify, grow and sustain niche high-potential STI capabilities that improves the competitiveness of existing and emerging economic sectors and that facilitates the development of new targeted industries with growth potential in aerospace, advanced manufacturing, chemicals, mining, advanced metals and ICTs. • To identify, grow and sustain niche high-potential STI capabilities for sustainable development and the greening of society and the economy. • To promote public engagement on science, technology and innovation.
<p>To build world-class STI infrastructure to extend the frontiers of knowledge, train the next generation of researchers and enable technology development and transfer as well as knowledge interchange.</p>	<ul style="list-style-type: none"> • To ensure availability of and access to internationally comparable research and innovation infrastructure in order to generate new knowledge and train new researchers. • To identify, grow and sustain niche high-potential STI capabilities for sustainable development and the greening of society and the economy.
<p>To position South Africa as a strategic international RDI partner and destination through the exchange of knowledge, capacity and resources between South Africa and its regional and other international partners, thereby strengthening the NSI.</p>	<ul style="list-style-type: none"> • To increase participation of South Africans in international human capital development opportunities to strengthen the South African NSI. • To increase international exposure to regional, continental and global knowledge and STI networks that will result in knowledge production, technology transfer and enhanced innovation in support of the NSI. • To ensure availability of and access to internationally comparable research and innovation infrastructure in order to generate new knowledge and train new researchers. • To secure STI funds to stimulate knowledge production, technology transfer, enhanced innovation and STI human capital development in pursuit of STI-based socio-economic development in South Africa.

3.6 Risk Management

In the last three financial years the Department has made significant progress in taking steps to enhance the practice of risk management, with the objective of improving the overall maturity level at a departmental and Programme level. Steps taken to improve the maturity level of risk management include (a) securing the support of the executive and management, (b) enhancing the risk management methodology (c) closing the lag between the planning process and the risk management process. In this regard the Department's Programme risk profiles have been finalised and approved prior to the start of the 2012/13 and 2013/14 fiscal years, (d) the existence of a fully functional and robust Enterprise Risk Management Committee (ERMC), that assists the Accounting Officer in executing his responsibilities for risk management, (e) providing awareness and training sessions on various aspects of risk management, and (f) enhancing the articulation of risks and risk related information.

While the Department is proud of the progress made to date, it remains cognisant that there are still areas requiring improvement and will continue to enhance the overall practice of risk management across the Department. The implementation of the Department's Enterprise Risk Management Strategy is guided by an annual implementation plan, the progress of which is closely monitored and reviewed by the ERMC and the Audit Committee. As part of its oversight role, the ERMC also monitors the implementation of action plans in mitigation of identified risks.

The Programme objectives form the basis for the risk profiles detailed in this annual performance plan. Management and staff from each Programme were involved in the formulation of their respective risk profiles. For the 2014/15 fiscal year, the Department with the assistance of the Enterprise Risk Management Committee and the Audit Committee will continue to monitor the progress made towards mitigating identified risks and improving its internal control environment. In addition, the executive and management place reliance on the Department's Internal Audit Activity to provide assurance on the effectiveness and adequacy of its risk management practice and the internal control environment. Feedback received from the Internal Audit Activity will be used, with other information, to update Programme risk profiles regularly and to trigger the re-assessment of risk should this become necessary.

4. OVERVIEW OF 2014/15 BUDGET AND MTEF ESTIMATES

Table 2: Department of Science and Technology expenditure estimates

R'000 Programmes	Audited outcome			2013/14		MTEF estimates		
	2010/11	2011/12	2012/13	Original appropriation	Adjusted Estimate	2014/15	2015/16	2016/17
Administration	188 858	195 556	225 270	268 158	245 658	290 960	309 183	311 188
Technology Innovation	802 774	854 944	1 033 186	1 627 145	1 122 062	991 623	1 018 511	1 023 105
International Cooperation and Resources	131 384	132 276	102 875	148 430	145 430	119 699	125 151	126 236
Research Development and Support	1 754 144	1 956 334	2 366 623	2 476 821	2 475 821	3 503 762	4 300 126	4 323 667
Socio-Economic Innovation Partnerships	1 174 742	1 264 362	1 245 361	1 677 601	1 677 601	1 564 146	1 801 349	1 850 636
Total	4 051 902	4 403 472	4 973 315	6 198 155	6 198 155	6 470 190	7 554 320	7 634 832
Compensation of employees	190 629	207 164	221 767	190 629	251 403	283 818	300 477	303 655
Goods and services	140 736	138 283	164 615	140 736	162 671	202 905	209 483	213 145
Transfers and subsidies	3 709 582	4 050 426	4 580 045	3 709 582	5 754 403	5 981 158	7 041 945	7 115 605
Payments for capital assets	10 603	6 946	6 490	10 603	29 678	2 309	2 415	2 427
Payments for financial assets	19	183	22	19	-	-	-	-
Total	4 051 902	4 403 472	4 973 315	4 051 902	6 198 155	6 470 190	7 554 320	7 634 832

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Programme
Performance Plans



Part B

PROGRAMME PERFORMANCE PLANS

PROGRAMME 1: ADMINISTRATION

Purpose: To conduct the overall management and administration of the Department. To ensure that organisations funded by the Department comply with good corporate governance standards and that their activities are aligned with the strategic focus of the NSI. Monitor and evaluate the performance of the science councils.

The Programme serves to facilitate policy alignment and planning and ensure effective governance, communication, monitoring and evaluation of performance in the DST and within the National System of Innovation (NSI). The Programme provides centralised strategic and administrative support, and is an essential strategic partner in the Department's governance, administration and programme delivery. The Programme is geared towards coordinating crosscutting policy implementation for the Department through the following:

- Coordinating the development of strategic plans, annual performance plans and operational plans for the Department.
- Supporting the Department in ensuring good corporate governance in public entities by facilitating public entity board appointments.
- Coordinating departmental engagements with the public entities through the Chairpersons', Chief Executive Officers' and Chief Financial Officers' Forums.
- Developing and implementing a monitoring and evaluation framework to assess the performance of the Department and its public entities.
- Coordinating in-year reporting and annual performance reviews for the Department and its public entities.
- Developing and implementing frameworks for institutional reviews of public entities.
- Ensuring effective communication between the Department and its key stakeholders, and creating awareness of the Department's key objectives and activities.
- Promoting the effective, efficient and economical use of financial resources in line with financial prescripts through the development and effective implementation of financial management systems, policies, frameworks and procedures.

Strategic objectives

- To coordinate the identification, formulation and implementation of strategic initiatives and ensure that the DST and its entities priorities are aligned to the national priorities.
- To develop and maintain good corporate governance systems for the Department and its entities.
- To make the DST an employer of choice and retain appropriately trained personnel.
- To provide an efficient and effective information technology services.
- To ensure effective and efficient financial and procurement services.

Subprogrammes

Ministry and Office of the Director-General supports the Minister, Deputy Minister and the Director-General by providing effective and efficient professional and executive support. The subprogramme is responsible for the development of systems and mechanisms for handling Parliamentary Questions and Replies, Cabinet matters, correspondence, submissions and memoranda. It also coordinates activities within the Department to assist in steering the NSI towards the development of a knowledge-intensive economy with higher productivity levels.

Enterprise Risk Management ensures that a risk management culture is embedded effectively and efficiently within the Department by creating risk management awareness, and elevating risk management to a strategic level in the Department in order to improve the DST's risk maturity level. The component's secondary role is to ensure that countering fraud is made an integral part of strategy, operations and administration in the Department (i.e. to promote a fraud risk management culture in the DST). In order to facilitate proper coordination and alignment of strategic initiatives across the Department, the directorate ensures ensure that the DST has a strategic risk profile register. The subprogramme focuses on ensuring that the Department's risk management maturity is at least at level 3 out of 4 and maintaining this maturity level over the medium-term.

Finance ensures effective, efficient and economic utilisation of financial resources in line with financial prescripts through the development and effective implementation of financial systems, policies, frameworks and procedures. This includes budget planning and expenditure monitoring; and the management of procurement, acquisition, logistics, asset, and financial transactions.

Policy, Planning, Governance, Monitoring and Evaluation supports the DST leadership in steering the NSI, in particular through the following:

- Coordinating cross-cutting policy processes across the Department.
- Coordinating the translation of policy priorities determined by the executive leadership into actionable plans with clear objectives, performance measures and resource commitments.
- Facilitating good governance in the Department and its entities.
- Ensuring that monitoring and evaluation activities undertaken in the NSI answer policy questions of economy, effectiveness and efficiency.
- Coordinating the integration and implementation of the NRDS and TYIP to ensure that the Department delivers on its strategic objectives.

Science Communication is responsible for ensuring effective communication between the Department and its key stakeholders, and creating awareness of the Department's key objectives and activities. The subprogramme raises the profile of the work done by the Programmes in line with the vision and mission of the Department. It also facilitates the preparation of information that the Minister and the Deputy Minister communicate externally.

Its overall focus is to brand the Department and create awareness about the developments, benefits and opportunities in publicly funded science and technology initiatives across the country's science system. In addition, it is important for this subprogramme to ensure that information is accessible to the public.

Human Resources ensures that the Department is able to (i) provide a professional service through accurate, consistent and best employment practices in all its activities, which are aimed at supporting the achievement of the DST's strategic and operational objectives; (ii) attract and retain employees who share the same organisational vision; (iii) champion change and transition, with a view to being a catalyst in the transition of people and the organisation to embrace and implement change; (iv) set

performance standards and manage performance against them; and (v) promote an environment that supports the personal and career development of all employees so that they can reach their full potential and contribute better to the achievement of the Department's strategic objectives and instil a culture of service excellence.

Legal Services This subprogramme is responsible for providing effective and efficient legal services to the Department in order to ensure that the interests of the Department are protected against any legal risk. The subprogramme ensures that the Department complies with relevant legislation and takes a proactive approach to dealing with matters that have the potential to give rise to conflict or legal challenges. The emphasis is on value-based decision-making, not merely risk limitation. Key to legal services is not to be reactive only, but also to be proactive in increasing the levels of awareness, collaboration, effective management and productivity. The subprogramme provides leadership on all legal matters by having an effective approach to resolving matters that have the potential to give rise to conflict or legal challenges.

Information Systems and Knowledge Management is responsible for the delivery of services that support the Department's strategic plan and individual units' objectives through the effective use of information technology. Its purpose is to align the Information Technology (IT) strategy with the business strategy to ensure that the Department achieves optimum use of its resources.

In addition, the subprogramme is tasked with the responsibility of providing cutting-edge technologies that will optimise the use of information in a reliable and secure manner. This includes the implementation of business systems that meet users' needs, the provision of a reliable IT infrastructure and environment, and the creation of capacity for proper information management and business intelligence.

Internal Audit Activity performs internal appraisal activities to provide assurance on the Department's governance, risk management, and control processes to help the Department achieve its strategic, operational, and financial and compliance objectives. Internal auditing is also a catalyst for improving the Department's effectiveness and efficiency by providing insight and recommendations based on analysis and assessment of data and business processes. The subprogramme supports the executive and political leadership in developing and maintaining processes, procedures and systems that strengthen corporate governance, internal controls and risk management, through the implementation of a flexible risk-based audit plan.

Table 3: Programme Risk Management- Administration

STRATEGIC OBJECTIVE	RISK DESCRIPTION	MITIGATION ACTION
<p>To coordinate the identification, formulation and implementation of strategic initiatives and ensure that the priorities of the DST and its entities are aligned to the national priorities.</p>	<p>Non adherence to the strategic planning cycle, as a result of (a) a lack of understanding of the planning concepts, (b) Programme managers not devoting adequate time for planning, (c) fast changing planning requirements from National Treasury (dispensation) and (d) the lack of a common understanding of the DST's mandate by Programmes.</p> <p>The impact should the risk materialise would be: (a) duplication of activities (excessive commitment of resources), (b) incurrance of avoidable additional financial expenditure, (c) the lack of clarity with regards to articulation of targets whether they can be measured and attained, (d) the inability to meet internal and external reporting deadlines (legislated as well as those prescribed through National Treasury Regulations) and (e) the damage to the Department's reputation (audit finding from Auditor-General and/or internal audit).</p>	<ul style="list-style-type: none"> The training manual on Performance Information Policy and Procedure Manual was approved by the Chief Operations Office (COO) and Executive Committee (EXCO) (The manual provides a guideline on how to manage the performance information); Implementation and monitoring of the Performance Information Policy and Procedure Manual I. <p>Create a forum to improve communications between the Policy Planning, Governance and Monitoring and Evaluation (PPGM&E) sub-programme and office mangers.</p>
<p>To develop and maintain a good corporate governance system for the Department and its entities.</p>	<p>Inaccurate, unreliable and incomplete reporting of actual achievements against predetermined objectives as indicated in the APP, as a result of (a) a lack of a project management system (monitoring, tracking and budgeting), (b) poor planning by Programmes, (c) a lack of evidence based target setting and (d) the lack of capacity/skills to analyse performance information.</p> <p>The impact should the risk materialise would be (a) uninformed/misinformed management decisions, (b) damage to the department's reputation, (c) an audit finding raised by the Auditor-General and/or the department's Internal Audit Activity and (d) a loss of funding.</p>	<p>Conduct awareness sessions on the strategic planning process. Provide training on planning concepts.</p> <ul style="list-style-type: none"> Develop a proposal on the introduction of project management system. Improve the use of baseline as a basis for planning (use past performance to set current target standards). An early warning system is used as part of a quarterly reporting mechanism. (This system enables programmes to be aware in advance of achievements and also indicate areas that are regressing). To recruit a monitoring and evaluation personnel with an audit background to assist with verifying evidence available on achievement against targets.

STRATEGIC OBJECTIVE	RISK DESCRIPTION	MITIGATION ACTION
<p>To develop and maintain a good corporate governance system for the Department and its entities.</p>	<p>Misalignment of entity objectives with DST objectives, as a result of limited co-ordination and alignment of plans between the DST and its entities.</p> <p>The impact should the risk materialise would be: (a) inability to meet internal and external reporting deadlines (legislated as well as those prescribed through National Treasury Regulations) and (b) the duplication of activities.</p> <p>The occurrence of incidents of fraud and corruption, as a result of (a) the absence of a formalised ethics programme, (b) inadequacies within the control environment (possibility of an opportunity for corruption to occur within the organisation) and (c) conflict of interest.</p> <p>The impact should the risk materialise would be (a) financial loss, (b) damage to the DST's reputation, (c) the inability to attract and maintain a skilled workforce, (d) the inability to deliver on the DST's objectives and (e) low staff morale due to a perceived tolerance of corruption (e.g. nepotism).</p> <p>Non adherence to Cabinet and Parliamentary timelines, as a result of (a) a lack of cooperation (buy-in) from Programmes, (b) low quality of Parliamentary Replies and (c) inadequate internal consultation (the importance of meeting deadlines and verifying information when drafting Parliamentary Replies).</p> <p>The impact should the risk materialise would be (a) a breach in legislative processes and (b) the damage to the Minister and the department's reputation.</p>	<p>The DST and its entities to continue to hold meetings (at different levels) between August and January of each year to deal with the content and alignment of strategic plans and annual performance plans.</p> <p>The DST shall continue to communicate the set priorities to its public entities.</p> <p>Implementation of the 2014/15 Fraud Prevention and Detection Plan.</p> <p>Conduct additional awareness sessions on fraud and corruption within the DST.</p> <p>Quarterly verification of gift registers (as per the Fraud Prevention and Detection Plan).</p> <p>Process requests from employees to conduct remunerated work outside of the Public Service.</p> <p>Provide feedback on adherence to Parliamentary Timelines.</p> <p>Enhance the internal processes for reporting.</p> <p>The timely distribution of schedules to Deputy Directors-General (DDGs) and office managers by the Ministry.</p> <p>The development of scarce and critical skill framework (intention: for the Department to identify scarce and critical skills important in delivering on its strategic objectives by attracting, developing and retaining such skills).</p> <p>Implementation or roll-out of the conducive working environment project:</p> <ul style="list-style-type: none"> • Job satisfaction. • Flexible working hours. • Survey - working environment survey. • Gender policy etc.

STRATEGIC OBJECTIVE	RISK DESCRIPTION	MITIGATION ACTION
	<p>Mismatch between DST requirements and the skills available in the market, as a result of (a) national or international shortage of certain skills (including certain representative workforce), (b) competition for the same specialist skills, and (c) competing with other entities (public and private) for certain prospective employees groups who are in highly sought after and in a position to demand above average remuneration packages (e.g. women and the disabled).</p>	<p>Review and implement revised Learning and Development Programme.</p>
<p>To make DST an employer of choice and retain appropriately trained personnel</p>	<p>High turnover amongst senior and middle management, as a result of (a) lack of clear career development opportunities, (b) culture of the organisation, with regards to leadership and management style (officials unable to adapt to the management style, which results in conflict and/or personality clashes) and the lack of visible leadership (management limitations in providing leadership at pivotal moments in the Programme's operations), and (c) competing with other entities (public and private) for specific skills possessed by some employee groups in high demand (e.g. women and the disabled).</p> <p>The impact should the risk materialise would be (a) loss of institutional memory, and (b) delay/failure in the delivery of objectives.</p>	<p>Enhanced implementation of the retention Initiatives (Roll-out of departmental programmes).</p> <p>Departmental Programmes entails:</p> <ul style="list-style-type: none"> • Leadership/Management Programmes. • Mentoring and Coaching. • Job Retention Programme. • Bursary Programme. • Competency based learning and development programme. <p>Full roll out of the leadership development programme which entails the following development programmes:</p> <ul style="list-style-type: none"> • Emerging and advanced management development programme. • Executive development programme. • Global leadership programme. • Mentoring and coaching. <p>Development of scarce and critical skill framework (intention: for the department to identify scarce and critical skills important in delivering on the strategic objectives of the department by attracting, developing and retaining such skills).</p> <p>Implementation or roll-out of the conducive working environment project:</p> <ul style="list-style-type: none"> • Job satisfaction. • Flexible working hours. • Survey - working environment survey. • Gender policy etc.

STRATEGIC OBJECTIVE	RISK DESCRIPTION	MITIGATION ACTION
	<p>Mismatch between DST requirements and the skills available in the market, as a result of (a) national or international shortage of certain skills (including certain representative workforce), (b) competition for the same specialist skills, and (c) competing with other entities (public and private) for certain prospective employees groups who are in highly sought after and in a position to demand above average remuneration packages (e.g. women and the disabled).</p> <p>The impact should the risk materialise would be (a) high vacancy rate, (b) high staff turnover, (c) inability to meet strategic objectives, and (d) non-achievement of EE targets.</p>	<p>Review and implement revised Learning and Development Programme.</p> <p>Rollout of the DST eRecruiting system (system to be used internally by HR to automate and replace functionality that was previously outsourced to recruiting agents).</p> <p>Engagements with the DPSA on the possible amendments to the current approved OSD for specialist/scientists, which do not meet the DST requirements.</p> <p>Enhanced implementation of the retention Initiatives (Roll-out of departmental programmes)</p> <p>Departmental Programmes entails:</p> <ul style="list-style-type: none"> • Leadership/Management Programmes. • Mentoring and Coaching. • Job Retention Programme. • Bursary Programme. • Competency based learning programme.
<p>To ensure efficient financial and procurement services</p>	<p>Under/over spending of the DST budget, as a result of (a.) poor financial management, planning and setting of unrealistic targets, (b) non-compliance with legislation and policy, and (c) inappropriate financial management (no consequences for non-compliance, management override/intervention).</p> <p>The impact should the risk materialise would be: (a) unauthorised expenditure; (overspending), (b) non delivery of services; (under spending), (c) damage to the Department's reputation, (d) qualified audit opinion, and (e) non-allocation of additional funds from National Treasury.</p>	<p>Continue to engage with the DDGs on the analysis of the Programme monthly expenditure report and to correct the under/overspending (a monitoring tool to ensure that risk remains within the acceptable levels).</p>

Programme performance indicators and annual targets for 2014/15

Table 4: Programme performance indicators and targets

Output	Performance indicator	Strategic target	Audited/Actual performance				Estimated performance 2013/14	Medium term targets		
			2010/11	2011/12	2012/13	2014/15		2015/16	2016/17	
DST planning documents (strategic plan, annual performance plan, Estimates of National Expenditure (ENE))	Percentage alignment of DST planning documents (strategic plan aligned to APP and APP aligned to ENE) submitted to Parliament	Minimum of 90% alignment in 2015/16 across/of DST planning documents strategic plan aligned to APP and APP aligned to ENE) submitted to Parliament by 31 March 2017	DST planning documents not aligned	DST planning documents not aligned	DST planning documents aligned	80% Aligned 2014/15 DST planning documents (strategic plan, annual performance plan) submitted to Parliament by 31 March 2014	Minimum of 90% alignment in 2015/16 across/of DST planning documents strategic plan aligned to APP and APP aligned to ENE) submitted to Parliament by 31 March 2015	Minimum of 90% alignment in 2016/17 across/of DST planning documents strategic plan aligned to APP and APP aligned to ENE) submitted to Parliament by 31 March 2016	Minimum of 90% alignment in 2017/18 across/of DST planning documents strategic plan aligned to APP and APP aligned to ENE) submitted to Parliament by 31 March 2017	
		100% alignment between the 2016 DST ENE and the 2016/17 APP by 31 March 2017	No baseline	No baseline	No baseline	90% aligned 2014 DST ENE and 2014/15 APP by 31 March 2014	90% alignment between the 2015 DST ENE and the 2015/16 APP by 31 March 2015	100% alignment between the 2016 DST ENE and the 2016/17 APP by 31 March 2016	100% alignment between the 2016 DST ENE and the 2016/17 APP by 31 March 2017	

Strategic objective: To coordinate (the identification, formulation and implementation of strategic initiatives) and ensure that the DST and its public entities priorities are aligned to the national priorities.

Output	Performance indicator	Strategic target	Audited/Actual performance			Estimated performance 2013/14	Medium term targets		
			2010/11	2011/12	2012/13		2014/15	2015/16	2016/17
DST public entities strategic and annual performance plans and shareholder compacts	Approved DST public entities' strategic and annual performance plans and signed shareholders' compacts	Approved 2017/18 DST public entities strategic and annual performance plans and signed shareholder compact by 31 March 2017	Approved annual performance plans (CSIR, HSRC, NRF, SANSA, ASSAf, AISA) and Strategic plans tabled in Parliament: CSIR, AISA, NRF, HSRC, TIA, SANSA and ASSAf signed shareholder compacts: CSIR, AISA, NRF, SANSA and HSRC	Approved annual performance plans (CSIR, HSRC, NRF, SANSA, ASSAf, AISA ¹) and Strategic plans tabled in Parliament: Signed shareholder compacts:	Approved 2014/15 DST public entities strategic and annual performance plans and signed shareholder compact by 31 March 2014	Approved 2015/16 DST public entities strategic and annual performance plans and signed shareholder compact by 31 March 2015	Approved 2016/17 DST public entities strategic and annual performance plans and signed shareholder compact by 31 March 2016	Approved 2017/18 DST public entities strategic and annual performance plans and signed shareholder compact by 31 March 2017	

¹ Effective from 1 April 2014, AISA will be incorporated into the HSRC and will no longer table a separate Strategic Plan and an Annual Performance Plan. In September 2014, AISA will, however, still table an Annual Report for the 2013/14 financial year.

Output	Performance indicator	Strategic target	Audited/Actual performance		Estimated performance 2013/14	Medium term targets		
			2010/11	2011/12		2012/13	2014/15	2015/16

Strategic Objective: To develop and maintain good corporate governance systems for the Department and its entities.

In-year monitoring reports	Number of DST performance reports (quarterly reports and annual reports) approved by DST EXCO and signed by DG (quarterly Reports approved and signed within 60 days after the end of each quarter)	12 DST quarterly performance reports approved by DST EXCO and signed by the DG within 60 days after each quarter	Approved DST performance reports	Approved DST performance reports	4 DST 2013/14 quarterly performance reports approved by DST EXCO and signed by the DG within 60 days after each quarter	4 DST 2014/15 quarterly performance reports approved by DST EXCO and signed by the DG within 60 days after each quarter	4 DST 2015/16 quarterly performance reports approved by DST EXCO and signed by the DG within 60 days after each quarter	4 DST 2016/17 quarterly performance reports approved by DST EXCO and signed by the DG within 60 days after each quarter
DST public entities' annual reports	Number of DST public entities' annual reports submitted to Parliament	3 DST annual reports approved by DST EXCO and signed by the DG by 31 May 2016	1 DST annual report approved by DST EXCO and signed by the DG	1 DST annual report approved by DST EXCO and signed by the DG	1 DST 2012/13 annual report approved by DST EXCO and signed by the DG by 31 May 2013	1 DST 2013/14 annual report approved by DST EXCO and signed by the DG by 31 May 2014	1 DST 2014/15 annual report approved by DST EXCO and signed by the DG by 31 May 2015	1 DST 2015/16 annual report approved by DST EXCO and signed by the DG by 31 May 2016
		25 DST public entities' 2015/16 annual reports submitted to Parliament by 30 September 2016	All public entities' annual reports were tabled in Parliament (AISA, ASSAF, CSIR, TIA, SANEDI, HSRC, NRF and SACNASP)	All public entities' annual reports were tabled in Parliament (AISA, ASSAF, CSIR, TIA, SANEDI, HSRC, NRF and SACNASP)	9 DST public entities' 2012/13 annual reports submitted to Parliament by 30 September 2013	9 DST public entities' 2013/14 annual reports submitted to Parliament by 30 September 2014	8 DST public entities' 2014/15 annual reports submitted to Parliament by 30 September 2015	8 DST public entities' 2015/16 annual reports submitted to Parliament by 30 September 2016

Output	Performance indicator	Strategic target	Audited/Actual performance		Estimated performance 2013/14	Medium term targets		
			2010/11	2011/12		2012/13	2014/15	2015/16
DST communication, marketing and/or media plans	Number of DST communication, marketing and/or media plans developed for DST programmes to profile the Department and to inform the citizenry approved by DST EXCO	20 communication, marketing and/or media plans developed for DST programmes to profile the Department approved by DST EXCO by 31 March 2017	4 communication, marketing and/or media plans developed for DST programmes to profile the Department	4 communication, marketing and/or media plans developed for DST programmes to profile the Department approved by DST EXCO	6 communication, marketing and/or media plans developed for DST programmes to profile the Department approved by DST EXCO by 31 March 2014	6 communication, marketing and/or media plans developed for DST programmes to profile the Department approved by DST EXCO by 31 March 2015	6 communication, marketing and/or media plans developed for DST programmes to profile the Department approved by DST EXCO by 31 March 2016	8 communication, marketing and/or media plans developed for DST programmes to profile the Department approved by DST EXCO by 31 March 2017
Science and technology media coverage monitoring media reports	Number of Science and Technology media coverage monitoring reports approved by DST EXCO	14 Science and Technology media coverage monitoring reports approved by DST EXCO by 31 March 2017	4 Science and Technology media coverage monitoring report approved by DST EXCO	4 Science and Technology media coverage monitoring reports approved by DST EXCO	4 Science and Technology media coverage monitoring reports approved by DST EXCO by 31 March 2014	4 Science and Technology media coverage monitoring reports approved by DST EXCO by 31 March 2015	4 Science and Technology media coverage monitoring reports approved by DST EXCO by 31 March 2016	6 Science and Technology media coverage monitoring reports approved by DST EXCO by 31 March 2017
Public participation programme	Number of public participation programmes conducted	30 public participation programmes conducted by 31 March 2017	6 public participation programmes conducted	10 public participation programmes conducted	10 public participation programmes conducted by 31 March 2014	10 public participation programmes conducted by 31 March 2015	10 public participation programmes conducted by 31 March 2016	10 public participation programmes conducted by 31 March 2017

Strategic objective: To proactively position the Department positively both internally and externally to ensure informed employees and citizenry.

Output	Performance indicator	Strategic target	Audited/Actual performance			Estimated performance 2013/14	Medium term targets		
			2010/11	2011/12	2012/13		2014/15	2015/16	2016/17

Strategic objective: To make the DST an employer of choice and retain appropriately skilled personnel.

Suitable skills and competencies for the Department	Turnaround time to fill vacancies	90 days to fill vacancy after date of advertisement by 31 March 2017	No baseline	No baseline	90 days to fill vacancy after date of advertisement	90 days to fill vacancy after date of advertisement by 31 March 2014	90 days to fill vacancy after date of advertisement by 31 March 2015	90 days to fill vacancy after date of advertisement by 31 March 2016	90 days to fill vacancy after date of advertisement by 31 March 2017
	Vacancy rate reduced to a set rate	Vacancy rate reduced to 6% by 31 March 2017	No baseline	8,79% vacancy rate	10,63% vacancy rate	Vacancy rate reduced to 7% by 31 March 2014	Vacancy rate reduced to 6% by 31 March 2015	Vacancy rate reduced to 6% by 31 March 2016	Vacancy rate reduced to 6% by 31 March 2017
	Percentage of DST personnel submitting performance contracts and reviews on time	Minimum 95% of DST personnel submitting performance contracts and reviews on time by 31 March 2017	No baseline	No baseline	No baseline	Minimum 80% of DST personnel submitting performance contracts and reviews on time by 31 March 2015	Minimum 90% of DST personnel submitting performance contracts and reviews on time by 31 March 2015	Minimum 92% of DST personnel submitting performance contracts and reviews on time by 31 March 2016	Minimum 95% of DST personnel submitting performance contracts and reviews on time by 31 March 2017

Output	Performance indicator	Strategic target	Audited/Actual performance			Estimated performance 2013/14	Medium term targets		
			2010/11	2011/12	2012/13		2014/15	2015/16	2016/17

Strategic objective: To provide an efficient and effective information technology service.

Enterprise Architecture for the DST	Number of enterprise Architecture Lifecycle steps developed and implemented	5 Enterprise Architecture Development Lifecycle steps developed and implemented by 31 March 2017	No baseline	No baseline	No baseline	2 Enterprise Architecture Development Lifecycle steps developed and implemented by 31 March 2014	2 Enterprise Architecture Development Lifecycle steps developed and implemented by 31 March 2015	3 Enterprise Architecture Development Lifecycle steps developed and implemented by 31 March 2016	Future state Enterprise Architecture (EA) implemented by 31 March 2017
IT governance framework for the DST	Number of IT governance framework components implemented	5 IT Governance Framework components implemented by 31 March 2017	No baseline	No baseline	No baseline	3 IT governance framework components implemented by 31 March 2014 (Phase 1 Establish IT Governance enabling environment by 31 March 2014)	3 IT governance framework components implemented by 31 March 2015 (Phase 2: Business-aligned ICT Strategic Planning by 31 March 2015)	2 IT governance framework components implemented by 31 March 2016 (Phase 2: Business-aligned ICT Strategic Planning by 31 March 2015)	Continuous improvement of IT governance framework by 31 March 2017 (Phase 3: Continuous improvement of IT governance framework by 31 March 2016)

Output	Performance indicator	Strategic target	Audited/Actual performance			Estimated performance 2013/14	Medium term targets		
			2010/11	2011/12	2012/13		2014/15	2015/16	2016/17
Strategic objective: To ensure effective and efficient financial and procurement services.									
Budget planning reports	Budget planning reports (MTEF and ENE) submitted to National Treasury	MTEF planning submission to NT by 31 August 2016 and ENE submitted to NT by 31 January 2017	MTEF submitted to NT by 31 August 2013 and ENE submitted to NT	MTEF submitted to NT by 31 August 2013 and ENE submitted to NT	MTEF submitted to NT by 31 August 2013 and ENE submitted to NT	2014 MTEF planning submission to NT by 31 August 2013 and 2014 ENE submitted to NT by 31 January 2014	2015 MTEF planning submission to NT by 31 August 2014 and 2015 ENE submitted to NT by 31 January 2015	2016 MTEF planning submission to NT by 31 August 2015 and 2016 ENE submitted to NT by 31 January 2016	2017 MTEF planning submission to NT by 31 August 2016 and 2017 ENE submitted to NT by 31 January 2017
Sound procurement process	Suppliers paid within 30 days from date of invoice and tender process completed within 90 days period	Suppliers paid within 30 days from date of invoice and tender process completed within 90 days	No baseline	No baseline	No baseline	Suppliers paid within 30 days from date of invoice and tender process completed within 90 days	Suppliers paid within 30 days from date of invoice and tender process completed within 90 days	Suppliers paid within 30 days from date of invoice and tender process completed within 90 days	Suppliers paid within 30 days from date of invoice and tender process completed within 90 days
Unqualified audit opinion on Financial Statements	Unqualified audit report of financial matters issued by the Auditor-General	Unqualified audit report on financial matters with no matters arising issued by the Auditor-General by 30 September 2016	Clean Audit report issued by the Auditor-General by 30 September 2011	Unqualified audit report issued by the Auditor-General	Unqualified audit report on financial matters issued by the Auditor-General by 30 September 2013	Unqualified audit report on financial matters issued by the Auditor-General by 30 September 2014	Unqualified audit report on financial matters issued by the Auditor-General by 30 September 2015	Unqualified audit report on financial matters issued by the Auditor-General by 30 September 2016	Unqualified audit report on financial matters issued by the Auditor-General by 30 September 2016

Quarterly targets for 2014/15

Table 5: Quarterly targets for the 2014/15 financial year

PERFORMANCE INDICATOR	REPORTING FREQUENCY	ANNUAL TARGET 2014/15	QUARTERLY TARGETS			
			QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4
Percentage alignment of DST planning documents (strategic plan aligned to APP and APP aligned to ENE) submitted to Parliament	Quarterly	Minimum of 90% alignment in 2015/16 across/of DST planning documents (strategic plan aligned to APP and APP aligned to ENE) submitted to Parliament by 31 March 2015	No target	First draft DST strategic plan and annual performance plan submitted to National Treasury and Presidency by 31 August 2014	Second draft DST strategic plan and annual performance plan submitted to National Treasury and Presidency by 30 November 2014	Minimum of 90% alignment in 2015/16 across/of DST planning documents (strategic plan aligned to APP and APP aligned to ENE) submitted to Parliament by 31 March 2015
Approved DST public entities' strategic and annual performance plans by the Minister and signed shareholders' compacts	Quarterly	90% alignment between the 2015 DST ENE and the 2015/16 APP by 31 March 2015	No target	No target	First draft DST ENE Chapter inputs submitted to Finance by 31 December 2014	Second draft DST ENE Chapter and MTEF database inputs submitted to Finance by 31 January 2015 Minimum 90% 2015 DST ENE and 2015/16 APP by 31 March 2015
	Quarterly	Approved 2015/16 DST public entities strategic and annual performance plans and signed shareholder compact by 31 March 2015	No target	First draft Strategic Plans and Annual Performance Plans for DST public entities (HSRC, SANSA, TIA, ASSAF, NRF) submitted to National Treasury by 31 August 2014	Second draft Strategic Plans and Annual Performance Plans for DST public entities (HSRC, SANSA, TIA, ASSAF, NRF) submitted to National Treasury by 30 November 2014	Approved 2015/16 Strategic Plans and Annual Performance Plans for DST public entities (HSRC, SANSA, TIA, ASSAF, NRF) by the Minister by 28 February 2015 Signed Shareholder Compacts by the Minister and Chairpersons of Boards of DST entities by 31 March 2015 (CSIR, HSRC, SANSA, TIA, ASSAF, NRF) by 31 March 2015

PERFORMANCE INDICATOR	REPORTING FREQUENCY	ANNUAL TARGET 2014/15	QUARTERLY TARGETS			
			QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4
Number of DST performance reports (quarterly reports and annual reports) approved by DST EXCO and signed by DG (quarterly Reports approved and signed within 60 days after the end of each quarter)	Quarterly Quarterly and annually	4 DST 2014/15 quarterly performance reports approved by DST EXCO and signed by the DG within 60 days after each quarter 1 DST 2013/14 annual report approved by DST EXCO and signed by the DG by 31 May 2014	1 DST 2013/14 quarterly performance report approved by DST EXCO and signed by the DG within 60 days after the end of the quarter 1 DST 2013/14 annual report approved by DST EXCO and signed by the DG by 31 May 2014	1 DST 2014/15 quarterly performance report approved by DST EXCO and signed by the DG within 60 days after the end of the quarter No target	1 DST 2014/15 quarterly performance report approved by DST EXCO and signed by the DG within 60 days after the end of the quarter No target	1 DST 2014/15 quarterly performance report approved by DST EXCO and signed by the DG within 60 days after the end of the quarter No target
Number of DST public entities annual reports submitted to Parliament	Annually	9 DST public entities' 2013/14 annual reports (CSIR, SANSA, TIA, AISA, ASSAF, NRF, SACNASP, NACI) submitted to Parliament by 30 September 2014	No target	9 DST public entities' 2013/14 annual reports (CSIR, SANSA, TIA, AISA, ASSAF, NRF, SACNASP, NACI) submitted to Parliament by 30 September 2014	No target	No target
Number of DST communication, marketing and/or media plans developed for DST programmes to profile the Department and to inform the citizenry approved by DST EXCO	Quarterly	6 communication, marketing and/or media plans developed for DST programmes to profile the Department approved by DST EXCO by 31 March 2015	1 communication, marketing and/or media plan developed for DST programmes to profile the Department approved by DST EXCO by 30 June 2014	1 communication, marketing and/or media plan developed for DST programmes to profile the Department approved by DST EXCO by 30 September 2014	2 communication, marketing and/or media plans developed for DST programmes to profile the Department approved by DST EXCO by 31 December 2014	2 communication, marketing and/or media plans developed for DST programmes to profile the Department approved by DST EXCO by 31 March 2015
Number of Science and Technology media coverage monitoring reports approved by DST EXCO	Quarterly	4 Science and Technology media coverage monitoring reports approved by DST EXCO by 31 March 2015	1 Science and Technology media coverage monitoring report approved by DST EXCO by 30 June 2014	1 Science and Technology media coverage monitoring report approved by DST EXCO by 30 September 2014	1 Science and Technology media coverage monitoring report approved by DST EXCO by 31 December 2014	1 Science and Technology media coverage monitoring report approved by DST EXCO by 31 March 2015

PERFORMANCE INDICATOR	REPORTING FREQUENCY	ANNUAL TARGET 2014/15	QUARTERLY TARGETS			
			QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4
Number of public participation programmes conducted	Quarterly	10 public participation programmes conducted by 31 March 2015	3 Public participation programmes conducted by 30 June 2014	4 public participation programmes conducted by 30 September 2014	1 public participation programme conducted by 31 December 2014	2 public participation programmes conducted by 31 March 2015
Percentage of DST personnel submitting performance contracts and reviews on time	Quarterly	Minimum 90% of DST personnel submitting performance contracts and reviews on time by 31 March 2015	90% of DST personnel submitted annual reviews for previous financial and year and probation reports by 30 June 2014	90% of DST personnel submitted performance contracts and probation reports by 31 September 2014	90% of employees submitted probation reports by 31 December 2014	90% of DST personnel submitted half yearly and probation review reports by 31 March 2015
Turnaround time to fill vacancies	Quarterly	90 days to fill vacancy after date of advertisement by 31 March 2015	90 days to fill vacancy after date of advertisement by 30 June 2014	90 days to fill vacancy after date of advertisement by 30 September 2014	90 days to fill vacancy after date of advertisement by 31 December 2014	90 days to fill vacancy after date of advertisement by 31 March 2015
Vacancy rate reduced to a set rate	Annually	Vacancy rate reduced to 6% by 31 March 2015	No target	No target	No target	Vacancy rate reduced to 6% by 31 March 2015
Budget planning reports (MTEF and ENE) submitted to National Treasury	Quarterly	2015 MTEF planning submission submitted to NT by 31 August 2014 and 2015 ENE submitted to NT by 31 January 2015	No target	2015 MTEF planning submission submitted to National Treasury by 31 August 2014	1 st draft 2015 ENE Chapter and database submitted to National Treasury by 31 December 2014	Final draft 2015 ENE Chapter and database submitted to National Treasury by 31 January 2015
Suppliers paid within 30 days after date of invoice and tender process completed within 90 days period	Quarterly	Suppliers paid within 30 days after date of invoice and tender process completed within 90 days	Suppliers paid within 30 days after date of invoice and tender process completed within 90 days	Suppliers paid within 30 days after date of invoice and tender process completed within 90 days	Suppliers paid within 30 days after date of invoice and tender process completed within 90 days	Suppliers paid within 30 days after date of invoice and tender process completed within 90 days
Unqualified audit report of financial matters issued by the Auditor-General	Annually	Unqualified audit report on financial matters issued by the Auditor-General by 30 September 2014	No target	Unqualified audit report on financial matters issued by the Auditor-General by 30 September 2014	No target	No target

PERFORMANCE INDICATOR	REPORTING FREQUENCY	ANNUAL TARGET 2014/15	QUARTERLY TARGETS			
			QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4
Number of Enterprise Architecture Development Lifecycle steps developed and implemented	Quarterly	2 Enterprise Architecture Development Lifecycle steps developed and implemented by 31 March 2015	Information Systems Architecture step (Phase 1 of 2) developed and implemented by 30 June 2014	Information Systems Architecture step (Phase 2 of 2) developed and implemented by 30 September 2014	Technology Architecture step (Phase 1 of 2) developed and implemented by 31 December 2014	Technology Architecture step (Phase 2 of 2) developed and implemented by 30 March 2015
Number of IT governance framework components implemented	Quarterly	3 IT governance framework components implemented by 31 March 2015 (Phase 2: Business-aligned ICT Strategic Planning by 31 March 2015)	Strategic alignment of business and ICT (Phase 1 of 2) by 30 June 2014	Strategic alignment of business and ICT (Phase 2 of 2) by 30 September 2014	Enablement of business by ICT by 31 December 2014	Governance and Management of ICT by the GITO by 31 March 2015

Reconciling performance targets with the budget and MTEF

Table 6: Administration expenditure estimates

R'000	Expenditure outcome			Adjusted appropriation 2013/14	Medium term expenditure estimates		
	2010/11	2011/12	2012/13		2014/15	2015/16	2016/17
Ministry	3 303	3 453	2 790	3 853	4 065	4 252	4 274
Management	64 812	63 703	65 852	86 254	102 198	107 052	107 588
Corporate Services	113 204	119 666	146 897	143 882	170 737	183 277	184 652
Governance	5 425	5 858	6 594	8 755	9 281	9 708	9 756
Office Administration	2 114	2 876	3 137	2 914	4 679	4 894	4 918
TOTAL	188 858	195 556	225 270	245 658	290 960	309 183	311 188
Compensation of employees	94 254	102 915	111 328	120 222	137 041	147 437	148 175
Goods and services	85 227	86 825	108 475	109 707	139 523	146 535	147 726
Transfers and subsidies	1 425	1 036	930	13 551	12 087	12 796	12 860
Payments for capital assets	7 940	4 780	4 526	2 178	2 309	2 415	2 427
	12	-	11	-	-	-	-
TOTAL	188 858	195 556	225 270	245 658	290 960	309 183	311 118

PROGRAMME 2- TECHNOLOGY INNOVATION

Purpose: The purpose of the Technology Innovation Programme is to enable research and development in strategic and emerging focus areas to promote the realisation of commercial products, processes and services from R&D outputs; through the implementation of enabling policy instruments. The Programme will contribute to the realisation of enhanced outputs of science, technology and innovation across the National System of Innovation (NSI), leading to enhanced competitiveness of the South African economy, and in improved quality of life for all.

Strategic overview

The Programme is informed by the NRDS and the TYIP. In terms of the NRDS, Programme 2 provided substance to the Innovation Pillar by establishing and funding the implementation of National Biotechnology Strategy. The Programme also implemented various initiatives in terms of the Human Capital and Transformation in SET Pillar. The TYIP guides the work of the Programme by identifying three “grand challenges” for which the Programme is responsible. These include the following:

- Strengthening the bioeconomy through the implementation of the Bio-economy Strategy, which replaces the original “Farmer to Pharma” value chain grand challenge identified in the TYIP. While the initial grand challenge focused on the development of technologies and associated products and services that would address science-based innovation needs in the health, industrial and agricultural sectors of the economy, the Bio-economy Strategy developed and approved late in 2013, was designed to leverage the initial experiences, expertise and competitive advantages gained to create a world-class biotechnology system of innovation. This system would operate at a much higher level than mere project support, and is more productive, responsive and relevant to the needs of South Africans.
- Space S&T, in which area South Africa intends to become a key global contributor, with SANSA, a growing satellite industry, and a range of innovations in space sciences, earth observation, communications, navigation and engineering.
- Energy security, where South Africa needs to meet its medium-term energy supply requirements while innovating for the long term in clean coal technologies, nuclear energy, renewable energy and the promise of the “hydrogen economy” to ensure a safe, clean, affordable and reliable energy supply.

In the past five years Programme 2 has therefore embarked on various initiatives and programmes in the strategic areas of Space S&T, Energy Security and Biotechnology. A review of the work of the Programme done over the current medium term (2009-2014) identified the need to deepen and strengthen the implementation of these initiatives and the “grand challenges” to which they are aligned, which will eventually result in the achievement of the MTSF outcomes for 2014-2019. The work undertaken by the Programme is aligned to the cross-cutting areas of the NGP, NDP and IPAP2.

The review also showed the necessity of revising the strategic objectives of the Programme to ensure better alignment with the goals of the Department and national priorities, and to enable the Programme to clarify its areas of priority along the entire R&D, innovation and commercialisation value chain, especially in the strategic and emerging areas of Space S&T, Energy Security, Bio-economy, Nanotechnology, Robotics, Photonics, IKS, IP management, technology transfer and technology commercialisation.

One of the Programme’s roles is to provide policy leadership to strengthen STI by initiating, developing and implementing various policies, regulations, innovation instruments and institutional arrangements. It is also expected to inform and influence policy and regulatory developments in other Departments owing to the cross-cutting nature and impact of its S&T interventions, especially in the strategic and emerging areas indicated. Policy instruments and institutional arrangements developed and implemented by the Programme and the Department to strengthen S&T innovation space need to be monitored and regulated through oversight instruments that include the periodic review and approval of policies, business plans, budgets and performance reports. The

development of high-end skills also requires the coordination and support of various initiatives that seek to enhance the number of postgraduates in the specified strategic and emerging areas.

Programme 2 also plays a key role in the development and translation of R&D outputs into commercialisable products, processes and services, by supporting the development of new technology-based products, filing and registering patents, and encouraging disclosures from publically financed R&D institutions.

Strategic objectives

- To lead, inform and influence policy development in areas of strategic science and technology innovation focus.
- To oversee, monitor and regulate key policy instruments, including institutional arrangements and support interventions in the strategic and emerging Science and Technology areas of Space Science, Energy, Biotechnology, Nanotechnology, Robotics, Photonics, Indigenous Knowledge Systems, Intellectual Property Management, Technology Transfer and Technology Commercialisation.
- To coordinate and support research and high-end skills development in the strategic and emerging Science and Technology areas of Space Science, Energy, Biotechnology, Nanotechnology, Robotics, Photonics, Indigenous Knowledge Systems, Intellectual Property Management, Technology Transfer and Technology Commercialisation.
- To support, promote, and advocate for the development and translation of scientific research and development outputs into commercial products, processes and services that will contribute towards economic growth and a better quality of life.

Subprogrammes

The programme is made up of four subprogrammes and one Specialised Service Delivery Unit (SSDU). They are the Space Science and Technology (SST) subprogramme, the Hydrogen and Energy subprogramme, the Bioeconomy subprogramme, the Innovation Priorities and Instruments (IPI) subprogramme and the National Intellectual Property Management Office (NIPMO) SSDU. A brief description of each subprogramme is provided below.

Bioeconomy subprogramme (including the Indigenous Knowledge-based Technology Innovation unit) was previously known as the Biotechnology and Health Innovation subprogramme. The name change reflects the need to better reflect its core mandate as well as to factor the recent incorporation of the Indigenous Knowledge (IK) based Technology Innovation unit under this subprogramme.

The subprogramme leads the DST's implementation of the National Bio-economy Strategy, which was approved by Cabinet in 2013. The Bio-economy Strategy was developed in response to the challenges encountered during the implementation of the 2001 National Biotechnology Strategy and differs from the National Biotechnology Strategy in that its prime focus is on the socio-economic outcomes and the strengthening of research and innovation competencies that form the strategic base of the bio-based NSI, rather than the mere development of technologies. It is a national strategy, incorporating the innovation needs of other departments and industry.

The Bio-economy Strategy focuses on three components:

- Strengthening research and innovation competencies that form the strategic base for the bio-based NSI, and are specifically designed to enable projects and product development to reach their desired end points.
- Strategic RDI programmes that provide for new knowledge and innovation outcomes related to the government's priority requirements.

- Coordination of role players across the bio-based NSI to ensure that appropriate skills, knowledge, and competencies are made available to ultimately enable greater success in achieving the desired outcomes of the projects, and hence improving socio-economic impacts.

Over the period 2014/15 to 2016/17, the subprogramme will endeavour to develop implementation plans for the Bio-economy Strategy in the thematic areas of health, agriculture and industry, and have them approved by EXCO. The implementation plans will be extended through the establishment of four coordinating committees that align with the thematic areas. In addition eight strategic product development partnerships, three joint ventures and strategic alliances between local bio-innovation firms and international partners, four new technology platforms and six new R&D initiatives will be supported in pursuit of the Bio-economy Strategy. In addition to 310 bio-entrepreneurs trained over this period, 50 PhDs will be supported.

Hydrogen and Energy subprogramme provides policy leadership in RDI initiatives in the energy sector that are of a cross-cutting nature and have long-term impacts. It plays a key role in developing a sustainable and globally competitive South African energy knowledge base and industry, especially as it relates to the nascent global hydrogen economy by informing and co-shaping the national energy policy in collaboration with the DoE and other key stakeholders. In particular, the Department plays an advisory role in the broader energy landscape, specifically in the development of the Integrated Energy Plan and Integrated Resource Plan, with special emphasis on the technologies to be used in addressing the country's energy needs, their deployment and the incentives required to facilitate the successful deployment of these technologies.

Over the period 2014/15 to 2016/17, the subprogramme will continue to support the three Hydrogen South Africa (HySA) CoCs (on Infrastructure, Catalysis and Systems), two hubs (Renewable Energy and Energy Efficiency), one on Clean Coal Technology, and two Biofuels research chairs. Over the same period two technology demonstration plants for lignocellulose-based biofuels and algae-based biofuels will be supported. Three prototypes will be developed and three patents registered. Over the same period 1 056 postgraduate students and technicians will have been funded, producing at least 75 publications in the field of energy.

The Department's position is that hydraulic fracturing be allowed in a phased manner once the regulatory framework has been established, so that independent research can be linked to both the exploration and exploitation phases. This will enable the development of know-how and collection of the required data to monitor the hydraulic fracturing activities. The Department will also support and assist through the shaping of appropriate research agendas and programmes in partnership with other relevant departments. Assuming that shale gas will contribute significantly to the future energy mix of South Africa, the Department will establish multi disciplinary research programmes by the 2015/16 financial year. Depending on collaborations and further investigations, the research programme may be executed through a research chair or a CoC.

Space Science and Technology is a cross-cutting, user-driven subprogramme that supports the creation of an environment conducive for the implementation of the NSS and SAEOS under the overarching guidelines of the National Space Policy, an instrument of the Department of Trade and Industry. The NSS was a response to the TYIP, which identified a few key outcomes that must be realised over the long term in order for South Africa to leverage the opportunities that the space value chain presented.

Over the period 2014/15 to 2016/17, the subprogramme will develop five implementation plans, including the National Space Programme (to be approved by Cabinet), and plans (to be approved by EXCO) for the upgrade of Houwteq, two CoCs and HCD. Two technical reports (on liquid rocket engine testing and a launch capability technology demonstrator) will be developed. Two CoCs (on satellite sensors and data processing), and one research chair (in satellite engineering) will be established. In terms of technology innovation projects, there will be two CubeSat launches, and one liquid or hybrid rocket engine demonstrator project will be undertaken. This is in addition to the completion of the ZA-ARMC-related satellite design, manufacturing model, and assembly, integration and testing model, and the completion of the India, Brasil, South Africa (IBSA) mission technical specification document and mission design. Other products and services developed over the period will include hyperspectral imaging for forestry and climate change purposes, earth observation for rural and urban development, and spatial planning and airborne lidar for agriculture and water resource management. Oversight instruments reviewed and approved will include six annual

reports from SANSA and NEOSS, 12 quarterly reports from SANSA, and three business and MTEF plans from SANSA. In addition, 40 postgraduate students will be supported (resulting in the graduation of 10 master's students) and 240 trainees will be supported through various space S&T-related initiatives.

Innovation Priorities and Instruments (including Emerging Research Areas) supports and strengthens the innovation policy package (and related interventions) aimed at creating and sustaining an enabling environment for innovation, technology development, and the commercialisation of publicly funded R&D initiatives. In performing this function, IPI supports the overall objectives of Programme 2 through the identification, development, creation and support of policy and institutional structures that facilitate technology development and its progression into national and international markets. With effect from the 2014/15 financial year, the Emerging Research Areas unit is to be incorporated into the IPI subprogramme. The emerging research areas (ERAs) are multidisciplinary S&T research fields that are not covered by conventional disciplines, and offer the potential to affect social and economic development positively. The ERA unit's focus includes the development of nanotechnology, photonics, synthetic biology and robotics through the roll-out of approved strategies and implementation plans.

Over the period 2014/15 to 2016/17, the subprogramme will develop two reports on national and international sources of RDI and commercialisation information, one report on RDI commercialisation trends (with recommendations), one EXCO-approved implementation plan for market and business intelligence collection in addition to eight technical visit/policy briefs developed in response to participation at international forums. An EXCO-approved framework will also be developed for the identification, development and maturation of ERAs, in addition to two frameworks and an implementation plan for nanotechnology innovation. In terms of innovation support interventions, an information matchmaking beta portal will be launched, tested and implemented; two model CoCs will be established; two technology matchmaking initiatives will be hosted, and approval for the establishment and implementation of a photonics competence enhancement initiative will be completed. In terms of oversight instruments, 6 APPs and 24 quarterly reports from TIA and NIPMO will be reviewed, as well as a report on the recommendations in respect of legislative review and/or amendment. A total of 36 postgraduates will be supported, resulting in the publication of 23 journal articles. In addition, 210 other trainees will be trained over this period.

National Intellectual Property Management Office (NIPMO) is the national implementation agency for the IPR-PFRD Act, which was promulgated on 22 December 2008 and put into operation on 2 August 2010. The long title of the IPR-PFRD Act reads "To provide for more effective utilisation of intellectual property emanating from publicly financed research and development; to establish the National Intellectual Property Management Office and the Intellectual Property Fund; to provide for the establishment of offices of technology transfer at institutions; and to provide for matters connected therewith."

After the enactment of the IPR-PFRD Act, NIPMO was set up as an interim office in Programme 2 (in mid-2011). A notice in *Government Gazette* No. 37123, promulgated on 13 December 2013, established NIPMO as an SSDU within the Department. The SSDU, the first one ever to be established in South African government, provides NIPMO with an enhanced level of autonomy to enable it to perform its facilitation and regulatory functions in terms of promoting the objects of the IPR-PFRD Act, which include providing "that intellectual property emanating from publicly financed research and development is identified, protected, utilised and commercialised for the benefit of the people of the Republic, whether it be for a social, economic, military or any other benefit". NIPMO is able to realise the objects of the legislation through at least four primary instruments, namely, offices of technology transfer (OTTs), the Intellectual Property Fund, compliance with the legislation, and incentives for IP creators.

Over the period 2014/15 to 2016/17, the SSDU will ensure that six OTTs are supported for capacity development each year, 430 IP creators are rewarded through the NIPMO incentive scheme, and 27 institutions receive a rebate for IP prosecution and maintenance costs from the IP Fund. In addition, 530 candidates will be trained in IP and technology transfer, and 850 new IP status and commercialisation reports (IP7 Forms) will be attracted from the OTTs.

Table 7: Programme risk management- Technology Innovation

STRATEGIC OBJECTIVE	RISK DESCRIPTION	MITIGATION ACTION
<p>To lead, inform and influence policy development in areas of strategic science and technology innovation focus.</p>	<p>Ineffective implementation of the Intellectual Property Rights from Publicly Financed Research and Development (IPR-PFRD) Act</p>	<p>Develop a three year strategy for NIPMO (including financial support to institutions, incentives required, skill development and awareness initiatives)</p> <p>MTEF submission, engagements with DST HR, Finance and IT</p> <p>Finalisation of draft protocol, draft SLA, HR and financial delegations and the necessary governance arrangement to facilitate the arms length relationship</p> <p>Appoint external service provider to implement the NIPMO Business Intelligence Management Information System</p> <p>Develop a working group</p> <p>NIPMO UNISA IP Chair</p> <p>NIPMO formalised training initiatives</p>
<p>To provide oversight, monitoring and regulation of key policy instruments, inclusive of institutional arrangements and support interventions;</p>	<p>Diminished/impaired relationship between DST, its established entities and/or programme implementers</p> <p>(a) oversight roles and responsibilities not clearly understood by role players; (b) ineffective review of entity performance (financial and non-financial) ; (c) responsibility for oversight, monitoring and regulation not formally delegated and agreed and (d) DST fails to provide strategic leadership and direction</p> <p>The impacts should the risk materialise would be</p> <p>(a) DST, its established entities and programme implementers failing to deliver on the agreed outcomes and (b) entities deviating from their policy mandate</p>	<p>Formal delegation of authority (in writing) for oversight monitoring and regulation (including roles, responsibilities and standard operating procedures)</p> <p>Customised reporting template for financial and non-financial reporting</p> <p>Development and implementation of the DST Ringed Fenced funding (finances) protocol</p> <p>KPIs included in performance agreements (DST personnel)</p> <p>Development and implementation of a relationship management framework</p>

STRATEGIC OBJECTIVE	RISK DESCRIPTION	MITIGATION ACTION
<p>To coordinate and support research and high-end skills development in the strategic and emerging Science and Technology areas of Space Science, Energy, Biotechnology, Nanotechnology, Robotics, Photonics, Indigenous Knowledge Systems, Intellectual Property Management, Technology Transfer and Technology Commercialisation.</p>	<p>Non-conducive environment for leveraging space technology and space related innovation through research and skills development; because (a) limited internal coordination within DST; (b) pipeline - limited pool of students into the NSI system; (c) blanket transfer of funds; (d) Lack of standardised SOPs and (e) limited partnerships with stakeholders (government, industry and academia)</p> <p>The impacts should the risk materialise (a.) low numbers of researchers (critical mass); (b) research and industry not being stimulated and (c) products and services not developed (remain stagnant)</p>	<p>Drafting the internal stakeholder roles and responsibilities clarification document</p> <p>Implement the Centre of Competence (CoC) - Increase the number of research chairs</p> <p>Sign contract (SLAs) to outline/specify deliverables</p> <p>Develop Standard Operating Procedures (SOPs) in relation to evaluating and monitoring contracts</p> <p>Produce a public participation plan</p>
<p>To support, promote, and advocate for the development and translation of scientific research and development outputs into commercial products, processes and services that will contribute towards economic growth and a better quality of life.</p>		
<p>Coordinate and support research and skills development in strategic and emerging S&T areas, including Space, Energy and the Bio-economy</p>	<p>Sub-optimal uptake of DST financed research initiatives by other government departments, agencies, or private sector because (a) mismatch between DST policies and stakeholder expectations and (b) poorly marketed strategic and emerging S&T areas development programme</p> <p>The impact should the risk materialise is poorly developed strategic and emerging S&T areas</p>	<p>Conduct annual stakeholder needs and wants analysis</p> <p>Conduct stakeholder briefing sessions as and when new programmes are introduced</p>

STRATEGIC OBJECTIVE	RISK DESCRIPTION	MITIGATION ACTION
<p>Coordinate and support research and skills development in strategic and emerging S&T areas, including Space, Energy and the Bio-economy</p>	<p>Mismatch between what DST seeks to achieve and the finance resources available because (a) Poor planning; (b) Change in funding priorities at National and/or Department levels; (c) Gap in the management/ implementation of R&D programmes; (d) Inability to motivate for additional funds for new and expanded mandates; (e) External economic and market variations impacting on funders ability to meet commitments to provide financial assistance; (f) Lack of prioritisation of the bio-economy initiatives ; (g) Duplication and mis-alignment of initiatives within government; (h) Inability to influence key agencies of DST(strategic and operational influence); and (i) Insufficient influence on National planning processes</p> <p>The impacts should the risk materialise would be (a) Inability to deliver on the mandate; (b) cancellation of projects; (c) reprioritisation of goals to align with resource availability (some projects are left out or deferred); (d) damage to Department's reputation (lack of confidence in the department's ability to deliver on its mandate); and (e) lack of buy in from stakeholders (including key project delivery partners) and poor contribution towards knowledge generation (global and national level)</p>	<p>Reprioritise projects in accordance with available funding</p> <p>Development of the Bio-economy strategy Implementation Plan</p> <p>Developing an implementation plan that improves coordination & alignment</p>

STRATEGIC OBJECTIVE	RISK DESCRIPTION	MITIGATION ACTION
<p>Support, promote, and advocate for, the development and translation of scientific R&D outputs into commercial products, processes and services.</p>	<p>Sub optimal exploitation and commercialisation of R&D outcomes, as a result of (a) two sectors (industry and government) have different philosophies and cultures with regards to the output of research and innovation effort and/or expenditure; (b) lack of interest in commercialisation from academia due to more lucrative incentives from DHET; (c) lack of understanding by potential partners of the commercialisation value chain; (d) inadequate review mechanism to align existing strategy with changes to the research and development environment; (e) inadequate human resource capacity and capability (internal); (f) Limited financial resources; (g) inadequate needs and wants analysis and identification</p> <p>The impacts should the risk materialise would be (a) limited contribution to socio-economic development and (b) to products and services emanating from publicly funded R&D in the market (national and international)</p>	<p>Develop a 3 year Communication Strategy (internal and external) and an annual implementation plan to address the communication needs of the Programme</p> <p>Develop a Memorandum Of Understanding (MOU) between DST and DHET (for DHET's incentives to include patents)</p> <p>To develop and implement the Commercialisation Framework (the framework is formulated to create a funding model and Stakeholder governance)</p> <p>Motivation developed and approved to enable appointment of additional resources for IPI.</p> <p>Financial needs articulated as part of DST SP and APP planning processes. Needs revised on an ongoing basis as part of ENE adjustments process annually.</p>
<p>Support, promote, and advocate for, the development and translation of scientific R&D outputs into commercial products, processes and services.</p>	<p>Misaligned strategic direction amongst NSI stakeholders; because of (a) disparate understanding of the purpose and intent of the NSI as well as the functioning of the inter-relationships that govern its success; (b) limited ability to forge effective links (relationships, policy alignment, culture and mind set) between industry, Government and public research environment; (c) inadequate performance assessment mechanisms for collaboration between departments and (d) inadequate coordination of incentives that could collectively improve research, development and innovation</p> <p>The impact should the risk materialise is the overlap of functions within DST Programmes (i.e. Programme 2 and Programme 5) and entities</p>	<p>Appropriate forums will be put in place to ensure convergence of similar initiatives, a multidisciplinary and interdisciplinary approach where necessary (meeting to be held between DDG Programme 2, 4, 5 and the COO)</p> <p>Regular engagements at Executive level between the DST and its Entities will also be formalised to ensure that the entities and their programmes remain aligned to the DST objectives and mandate thus promoting coordination and optimisation in the NSI</p>

Programme performance indicators and annual targets for 2014/15

Table 8: Programme performance indicators and targets

Output	Performance indicator	Strategic target	Audited/Actual performance			Estimated performance 2013/14	Medium term targets		
			2010/11	2011/12	2012/13		2014/15	2015/16	2016/17
Strategic objective: To lead, inform and influence policy development in areas of strategic science and technology innovation focus									
Policy instruments developed and implemented in terms of leading, informing and influencing policy development in areas of strategic science and technology innovation focus	Number of policy instruments ² developed/implemented to strengthen S&T innovation	29 policy instruments developed/implemented by 31 March 2017	4 policy instruments developed/implemented	4 policy instruments developed/implemented	6 policy instruments developed/implemented	4 policy instruments developed/implemented by 31 March 2014	16 policy instruments developed/implemented by 31 March 2015	7 policy instruments developed/implemented by 31 March 2016	6 policy instruments developed/implemented by 31 March 2017
Institutional arrangements overseen, monitored in terms of leading, informing and influencing policy development in areas of strategic science and technology innovation focus	Number of institutional arrangements ³ overseen, monitored and regulated to strengthen S&T innovation	15 institutional arrangements overseen, monitored and regulated to strengthen S&T innovation by 31 March 2017	No baseline	No baseline	No baseline	2 institutional arrangements overseen, monitored and regulated to strengthen S&T innovation by 31 March 2014	7 institutional arrangements overseen, monitored and regulated to strengthen S&T innovation by 31 March 2015	4 institutional arrangements overseen, monitored and regulated to strengthen S&T innovation by 31 March 2016	4 institutional arrangements overseen, monitored and regulated to strengthen S&T innovation by 31 March 2017

² Refers to Policies, Acts, Regulations, Strategies, Implementation Plans, Policy briefs, Research/Technical Reports

³ Refers to institutional arrangements such as coordinating committees, partnerships, joint ventures and other strategic arrangements undertaken to drive implementation of national, and specifically, DST policies and strategies.

Output	Performance indicator	Strategic target	Audited/Actual performance			Estimated performance 2013/14	Medium term targets		
			2010/11	2011/12	2012/13		2014/15	2015/16	2016/17
Innovation support interventions developed and supported in terms of leading, informing and influencing policy development in areas of strategic science and technology innovation focus	Number of innovation support interventions ⁴ developed/ ⁵ supported ⁶ in key strategic areas ⁷	574 innovation support interventions developed/ supported in key strategic area by 31 March 2017	20 innovation support interventions developed/ supported in key strategic areas	14 innovation support interventions developed/ supported in key strategic areas	37 innovation support interventions developed/ supported in key strategic areas	50 innovation support interventions developed/ supported in key strategic area by 31 March 2014	285 innovation support interventions developed/ supported in key strategic area by 31 March 2015	140 innovation support interventions developed/ supported in key strategic area by 31 March 2016	149 innovation support interventions developed/ supported in key strategic areas by 31 March 2017

Strategic Objective: To oversee, monitor and regulate key policy instruments, including institutional arrangements and support interventions in the strategic and emerging Science and Technology areas of Space Science, Energy, Biotechnology, Nanotechnology, Robotics, Photonics, Indigenouse Knowledge Systems, Intellectual Property Management, Technology Transfer and Technology Commercialisation.

Oversight instruments developed/ reviewed in terms of providing oversight, monitoring and regulation of key policy instruments	Number of oversight instruments ⁷ developed/ reviewed to strengthen S&T innovation	55 oversight instruments developed/ reviewed to strengthen S&T innovation by 31 March 2017				New indicator	18 oversight instruments developed/ reviewed to strengthen S&T innovation by 31 March 2015	19 oversight instruments developed/ reviewed to strengthen S&T innovation by 31 March 2016	18 oversight instruments developed/ reviewed to strengthen S&T innovation by 31 March 2017
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⁴ Refers to interventions that support technology innovation, such as Centres of Competence, Centres of Excellence, research chairs, technology platforms, technology incubators, OTTs and technology matchmaking programmes

⁵ Refers to Space S&T, Energy Security, Bioeconomy, Nanotechnology, Robotics, Photonics, IKS, IP Management, Technology Transfer and Technology Commercialisation.

⁶ Support refers to funding support, where a payment has been transferred by the Department to the entity responsible for implementation

⁷ Refers to quarterly and annual reports produced and reviews undertaken for Institutional entities to drive implementation of national, and specifically, DST policies and strategies, such as the NRF, CSIR, SANSA, TIA and NIPMO.

Output	Performance indicator	Strategic target	Audited/Actual performance			Estimated performance 2013/14	Medium term targets		
			2010/11	2011/12	2012/13		2014/15	2015/16	2016/17
Strategic objective: To coordinate and support research and high-end skills development in the strategic and emerging Science and Technology areas of Space Science, Energy, Biotechnology, Nanotechnology, Robotics, Photonics, Indigenous Knowledge Systems, Intellectual Property Management, Technology Transfer and Technology Commercialisation.									
Postgraduate students financially supported in order to build capacity and capability in key strategic areas	Number of postgraduate students (MSc, PhD) financially supported in key strategic areas	1146 postgraduate students (MSc, PhD) financially supported in key strategic areas by 31 March 2017	251 new and additional students and technicians funded	220 undergraduate and postgraduate students and technicians funded	274 undergraduate and postgraduate students and technicians funded	296 undergraduate and postgraduate students and technicians funded by 31 March 2014	352 postgraduate students (MSc, PhD) financially supported in key strategic areas by 31 March 2015	382 postgraduate students (MSc, PhD) financially supported in key strategic areas by 31 March 2016	412 postgraduate students (MSc, PhD) financially supported in key strategic areas by 31 March 2017
Postgraduates produced in order to build capacity, specialised skills and knowledge in key strategic areas	Number of postgraduate students (MSc, PhD) produced in key strategic areas	42 postgraduates (MSc, PhDs) produced in key strategic areas by 31 March 2017	251 new and additional students and technicians funded	220 undergraduate and postgraduate students and technicians funded	274 undergraduate and postgraduate students and technicians funded	286 undergraduate and postgraduate students and technicians funded by 31 March 2014	6 postgraduates (MSc, PhDs) produced in key strategic areas by 31 March 2015	9 postgraduates (MSc, PhDs) produced in key strategic areas by 31 March 2016	27 postgraduates (MSc, PhDs) produced in key strategic areas by 31 March 2017
People trained in order to build capacity, specialised skills and knowledge in key strategic areas	Number of trainees ⁸ supported ⁹ in key strategic areas	1290 trainees supported in key strategic areas by 31 March 2017	101 candidates trained in IP and technology transfer specialised skills	40 candidates trained in IP and technology transfer specialised skills	50 trainees completed programme and 40 candidates trained in IP and technology transfer specialised skills	55 trainees completed programme and 40 candidates trained in IP and technology transfer specialised skills.50 bio entrepreneurs trained by 31 March 2014	340 trainees supported in key strategic areas by 31 March 2015	430 trainees supported in key strategic areas by 31 March 2016	520 trainees supported in key strategic areas by 31 March 2017

⁸ Trainees refer to students, interns, technicians, mentors, academics, researchers, innovators and entrepreneurs

⁹ Trainee support refers to specifically refers to support in the form of bursaries, internships, high-end skills development initiatives including the provision of facilities, resources and equipments, conferences and workshops. Most of the support listed above is provided by entities reporting to the Department.

Output	Performance indicator	Strategic target	Audited/Actual performance			Estimated performance 2013/14	Medium term targets		
			2010/11	2011/12	2012/13		2014/15	2015/16	2016/17
Publication of new knowledge generated in key strategic areas	Number of publications ¹⁰ in key strategic areas	98 publications in key strategic areas by 31 March 2017	6 publications as a result of HySA related CoC activity	6 publications resulting from R&D- funded	6 publications resulting from R&D funded	6 publications resulting from funded R&D initiatives by 31 March 2014	28 publications in key strategic areas by 31 March 2015	35 publications in key strategic areas by 31 March 2016	35 publications in key strategic areas by 31 March 2017

Strategic objective: To support, promote, and advocate for the development and translation of scientific research and development outputs into commercial products, processes and services that will contribute towards economic growth and a better quality of life

New technology innovation products developed and supported	Number of new technology innovation products ¹¹ developed/supported ¹² in key strategic areas	14 new technology innovation products developed/supported in key strategic areas projects by 31 March 2017	24 new technology innovation products developed/supported	26 new technology innovation products developed/supported	37 new technology innovation products developed/supported	4 new technology innovation products developed/supported by 31 March 2014	6 new technology innovation products developed/supported in key strategic areas projects by 31 March 2015	3 new technology innovation products developed/supported in key strategic areas projects by 31 March 2016	5 new technology innovation products developed/supported in key strategic areas projects by 31 March 2017
New patents registered in terms of the development and translation of scientific research and development outputs into commercial products, processes and services	Number of new patents in the key strategic areas registered/granted	9 new patents in the key strategic areas registered/granted	5 patents registered	5 patents registered	5 patents registered	3 new patents registered/granted in key strategic areas by 31 March 2014	3 new patents registered/granted in key strategic areas by 31 March 2015	3 new patents registered/granted in key strategic areas by 31 March 2016	3 new patents registered/granted in key strategic areas by 31 March 2017

¹⁰ Publications refer to academic/scientific work published in a journal, books or thesis form, edited volumes, where each chapter is the responsibility of a different author or set of authors, presentation at academic conferences, especially those organised by learned societies, and technical reports and working papers issued by individual researchers or research organisations on their own initiative.

¹¹ Technology innovation products refer to prototypes, technology demonstrators, technology transfer packages developed as a result of technological innovation

¹² New technology innovation products are developed/supported in terms of the development and translation of scientific research and development outputs into commercial products, processes and services.

Output	Performance indicator	Strategic target	Audited/Actual performance			Estimated performance 2013/14	Medium term targets		
			2010/11	2011/12	2012/13		2014/15	2015/16	2016/17
New trademarks, designs, copyrights, plant breeders rights registered in terms of the development and translation of scientific research and development outputs into commercial products, processes and services	Number of trademarks, designs, copyrights, plant breeders rights registered in the key strategic areas	3 trademark, design, copyright, plant breeders rights registered in the key strategic areas 31 March 2017				New indicator	1 trademark, design, copyright, plant breeders rights registered in the key strategic areas 31 March 2015	1 trademark, design, copyright, plant breeders rights registered in the key strategic areas 31 March 2016	1 trademark, design, copyright, plant breeders rights registered in the key strategic areas 31 March 2017
New disclosures reported by publicly-funded institutions in terms of the development and translation of scientific research and development outputs into commercial products, processes and services	Number of disclosures reported by publicly-funded institutions	850 disclosures reported by publicly-funded institutions by 31 March 2017	No baseline	No baseline	197 new disclosures received from offices of technology transfer at institutions by 31 March 2013	250 new disclosures received from offices of technology transfer at institutions by 31 March 2014	250 disclosures reported by publicly-funded institutions by 31 March 2015	300 disclosures reported by publicly-funded institutions by 31 March 2016	300 disclosures reported by publicly-funded institutions by 31 March 2017

Output	Performance indicator	Strategic target	Audited/Actual performance			Estimated performance 2013/14	Medium term targets		
			2010/11	2011/12	2012/13		2014/15	2015/16	2016/17
New technologies commercialised in terms of the development and translation of scientific research and development outputs into commercial products, processes and services	Number of new technologies ¹³ commercialised in key strategic areas	3 new technologies commercialised in key strategic areas by 31 March 2017	No baseline	10 new technology products/ processes/ services commercialised	58 new technology products/ processes/ services developed for commercialisation and 3 commercialised and 2 licensed	15 technology solutions commercialised through TIA	1 new technology commercialised in key strategic areas by 31 March 2015	1 new technology commercialised in key strategic areas by 31 March 2016	1 new technology commercialised in key strategic areas by 31 March 2017
Dissemination outputs produced in terms of advocating, promoting and support the growth and development of key strategic areas	Number of dissemination outputs ¹⁴	30 dissemination outputs by 31 March 2017				New indicator	10 dissemination outputs by 31 March 2015	10 dissemination outputs by 31 March 2016	10 dissemination outputs by 31 March 2017

¹³ Refers to technology based products, services and processes transferred, licensed, or sold to non-profit organisations, government departments or private sector organisations.

¹⁴ Refers to dissemination materials (brochures, pamphlets) peer-reviewed articles, conferences, workshops, seminars publications in popular media, public announcements, speeches, radio and television appearances, websites, newsletters, blogs, success stories, social media campaign (Twitter, Facebook, LinkedIn, iMXit).

Table 9: Quarterly targets for 2014/15 financial year

PERFORMANCE INDICATOR	REPORTING PERIOD	QUARTERLY TARGETS			
		QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4
Number of policy instruments developed/implemented to strengthen S&T innovation	Quarterly	16 policy instruments developed/implemented by 31 March 2015	3 policy instruments developed/implemented by 30 September 2014	4 policy instruments developed/implemented by 31 December 2014	5 policy instruments developed/implemented by 31 March 2015
Number of institutional arrangements overseen, monitored and regulated to strengthen S&T innovation	Annually	7 institutional arrangements overseen, monitored and regulated to strengthen S&T innovation by 31 March 2015	No target	No target	7 institutional arrangements overseen, monitored and regulated to strengthen S&T innovation by 31 March 2015
Number of oversight instruments developed/reviewed to strengthen S&T innovation	Quarterly	18 oversight instruments developed/reviewed to strengthen S&T innovation by 31 March 2015	3 oversight instruments developed/reviewed to strengthen S&T innovation by 30 June 2014	3 oversight instruments developed/reviewed to strengthen S&T innovation by 31 December 2014	3 oversight instruments developed/reviewed to strengthen S&T innovation by 31 March 2015
Number of innovation support interventions developed/supported in key strategic areas	Quarterly	285 innovation support interventions developed/supported in key strategic areas by 31 March 2015	4 innovation support interventions developed/supported in key strategic areas by 30 September 2014	7 innovation support interventions developed/supported in key strategic areas by 31 December 2014	271 innovation support interventions developed/supported in key strategic areas by 31 March 2015
Number of postgraduate students (MSc, PhD) financially supported in key strategic areas	Annually	352 postgraduate students (MSc, PhD) financially supported in key strategic areas by 31 March 2015	No target	No target	352 postgraduate students (MSc, PhD) financially supported in key strategic areas by 31 March 2015
Number of postgraduate students (MSc, PhD) produced in key strategic areas	Annually	6 postgraduates (MSc, PhDs) produced in key strategic areas by 31 March 2015	No target	No target	6 postgraduates (MSc, PhDs) produced in key strategic areas by 31 March 2015

PERFORMANCE INDICATOR	REPORTING PERIOD	ANNUAL TARGET	QUARTERLY TARGETS				
			QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4	
Number of trainees supported in key strategic areas	Biannually	340 trainees supported in key strategic areas by 31 March 2015	60 trainees supported in key strategic areas by 30 June 2014	No target	No target	No target	280 trainees supported in key strategic areas by 31 March 2015
Number of publications in key strategic areas	Quarterly	28 publications in key strategic areas by 31 March 2015	No target	6 publications in key strategic areas by 30 September 2014	6 publications in key strategic areas by 31 December 2014	6 publications in key strategic areas by 31 March 2015	16 publications in key strategic areas by 31 March 2015
Number of new technology innovation products developed/supported in key strategic areas	Quarterly	6 new technology innovation products developed/supported in key strategic areas projects by 31 March 2015	1 new technology innovation product developed/supported in key strategic areas by 30 June 2014	1 new technology innovation product developed/supported in key strategic areas by 30 September 2014	No target	No target	4 new technology innovation products developed/supported in key strategic areas by 31 March 2015
Number of new patents in the key strategic areas registered/granted	Annually	3 new patents in the key strategic areas registered/granted by 31 March 2015	No target	No target	No target	No target	3 new patents in the key strategic areas registered/granted by 31 March 2015
Number of trademarks, designs, copyrights, plant breeders rights in the key strategic areas	Annually	1 trademark, design, copyright, plant breeders rights in the key strategic areas 31 March 2015	No target	No target	No target	No target	1 trademark, design, copyright, plant breeders rights in the key strategic areas 31 March 2015
Number of disclosures reported by publicly-funded institutions	Annually	250 disclosures reported by publicly-funded institutions by 31 March 2015	No target	No target	No target	No target	250 disclosures reported by publicly-funded institutions by 31 March 2015
Number of new technologies commercialised in key strategic areas	Annually	1 new technology commercialised in key strategic areas by 31 March 2015	No target	No target	No target	No target	1 new technology commercialised in key strategic areas by 31 March 2015
Number of dissemination outputs	Quarterly	10 dissemination outputs by 31 March 2015	2 dissemination outputs by 30 June 2014	1 dissemination outputs by 30 September 2014	5 dissemination outputs by 31 December 2014	2 dissemination outputs by 31 March 2015	2 dissemination outputs by 31 March 2015

Reconciling performance targets with the budget and MTEF

Table 10: Technology Innovation expenditure estimates

R'000	Expenditure outcome			Adjusted appropriation 2013/14	Medium term expenditure estimates		
	2010/11	2011/12	2012/13		2014/15	2015/16	2016/17
Bioeconomy	169 034	107 352	125 728	132 069	132 869	138 905	139 232
Hydrogen and Energy	130 844	145 641	131 881	146 237	146 430	153 054	153 307
Space Science and Technology	74 213	115 743	170 269	203 386	169 939	173 870	175 212
Innovation Priorities and Instruments	519 288	550 293	574 128	611 491	517 277	527 028	529 060
National Intellectual Properties Management Office	-	26 661	31 180	28 879	25 108	25 654	26 294
TOTAL	893 379	945 690	1 033 186	1 122 062	991 623	1 018 511	1 023 105
Compensation of employees	24 637	29 452	30 086	35 129	41 976	43 047	43 064
Goods and services	16 103	15 190	19 043	12 249	21 947	23 303	24 352
Transfers and subsidies	851 029	900 373	983 489	1 047 184	927 700	952 161	955 689
Payments for capital assets	1 604	675	568	27 500	-	-	-
Payments for financial assets	6	-	-	-	-	-	-
TOTAL	893 379	945 690	1 033 186	1 122 062	991 623	1 018 511	1 023 105

PROGRAMME 3: INTERNATIONAL COOPERATION AND RESOURCES

Purpose: International Cooperation and Resources (ICR) aims to strategically develop, promote and manage international relationships, opportunities and S&T agreements that strengthen the NSI and enable an exchange of knowledge, capacity and resources between South Africa and its regional and international partners. ICR also supports South African foreign policy through science diplomacy.

Strategic overview

International cooperation in STI is increasing in intensity among both developing and developed countries, stimulated by global challenges such as the environment, food and energy security, and health, among other factors. To date, most agreements – whether economic, trade, security or environmental - have provisions on STI, making science diplomacy an essential tool. Since its readmission to the global community, South Africa has established formal relations with many countries in both the North and the South. STI is now an active part of the Brazil, Russia, India, China and South Africa (BRICS) cooperation.

The Programme's mandate is derived from and responds to government's foreign policy as led by the Department of International Relations and Cooperation. In order to support the Department's role in building an NSI that will bring about sustainable economic growth and improved quality of life for all, the Programme will identify human capital development opportunities for STI personnel exchange, data and information sharing, workshops, joint research programmes, STI funding, and access to global research facilities as well as supporting the construction of world-class research facilities in South Africa and the African continent.

ICR will support South Africa's foreign policy to create a better South Africa and contribute to a better and safer Africa in a better world. This will be done by consolidating STI cooperation in Africa; strengthening our North-South partnerships, and by engaging on STI matters with our South-South partners.

ICR will, in line with the NDP use STI to deepen South Africa's integration into the global community by promoting regional STI collaboration at SADC level, continentally and globally. Where possible, opportunities will be sought to support the strengthening of the system of innovation on the continent. However, the relationships established with the North have over the years contributed significantly to the strengthening of the South African NSI and will continue to be managed carefully going forward.

To be effective, national systems of innovation need the private sector, government, academia and society to work together. Programme 3 will therefore identify opportunities for private sector partnerships, in particular with multinational corporations, and private sector investment in RDI activities in South Africa, including partnerships in human capital development.

Strategic objectives

- To secure STI funds to stimulate knowledge production, technology transfer, enhanced innovation and STI human capital development in pursuit of STI-based socio-economic development in South Africa.
- To increase South Africa's international exposure to regional, continental and global knowledge and STI networks that will result in knowledge production, technology transfer and enhanced innovation in support of the NSI.
- To contribute towards the shaping of regional, continental and global STI discourse, decision making and policy formulation using science diplomacy to ensure representation of the interests of South Africa.
- To support STI capacity in the African continent to create conditions for the development of a knowledge-based economy in Africa.

- To increase participation by South Africans in international human capital development opportunities to strengthen the South African NSI.

Subprogrammes

International Resources works to increase the flow of international resources into the country by creating conditions for access to international STI skills and global projects.

Multilateral Cooperation and Africa advances and facilitates South Africa's participation in strategic African bilateral agreements and multilateral organisations on STI, so as to strengthen the NSI and to achieve shared economic and social development in the region and the continent.

Overseas Bilateral Cooperation promotes and facilitates collaborative activities and leverages resources in support of the NSI from countries outside Africa, with a specific focus on developing a knowledge-driven economy.

Table 11: Programme risk management: International Cooperation and Resources

STRATEGIC OBJECTIVE	RISK DESCRIPTION	MITIGATION ACTION
<p>To secure STI funds to stimulate knowledge production, technology transfer, enhanced innovation and STI human capital development in pursuit of STI-based socio-economic development in South Africa.</p>	<p>Possible cut-backs in the budget for international cooperation and/or development assistance of international partners, as a result of: (a) the DST has no control over the budgeting process of international partners, (b) political, economic and natural upsets, (c) DST budget cuts, and (d) inability of taking up of international funding by the DST.</p> <p>The impact should the risk materialise would be: (a) inability to achieve objectives, (b) inability to meet targets with regards to leveraging, (c) DST under spending, (d) re-directing of priorities within the Programme, and (e) damage to the DST's reputation.</p>	<p>Revise measures to ensure coverage of strategic partners.</p> <p>Conduct scenario planning.</p> <p>Obtaining political and executive support/buy-in.</p>
<p>To increase international exposure to regional, continental and global knowledge of STI networks that will result in knowledge production, technology and enhanced innovation in support of the NSI.</p>	<p>Limited uptake of international opportunities;</p> <p>Uptake by:</p> <ul style="list-style-type: none"> • South African NSI Partners; • International Partners; • Students; <p>As a result of (a) no measurement system to understand historical uptake of foreign funding, (b) inadequate understanding of future requirements and possibilities for uptake, (c) type of scholarships offered and cultural differences, (d) no system (e.g. needs analysis) for determining what opportunities are required and what resources are available, and (e) afro-pessimism on the quality of South African Science and Technology (S&T) capabilities.</p> <p>The impact should the risk materialise are: (a) reduced follow up on projects and damage to relationships with partners, and (b) reduced ability to deliver on Government's mandate.</p>	<p>Implement system for measurement of uptake.</p> <ul style="list-style-type: none"> • Analyse the needs of students and researchers. • Conduct awareness campaigns of what projects are available and what is required by South African students. <p>Facilitate exposure of South African researchers & students through international projects.</p>
<p>To increase participation by South Africa in international human capital development opportunities to strengthen the South Africa NSI.</p>	<p>Limited uptake of international opportunities;</p> <p>Uptake by:</p> <ul style="list-style-type: none"> • South African NSI Partners; • International Partners; • Students; <p>As a result of (a) no measurement system to understand historical uptake of foreign funding, (b) inadequate understanding of future requirements and possibilities for uptake, (c) type of scholarships offered and cultural differences, (d) no system (e.g. needs analysis) for determining what opportunities are required and what resources are available, and (e) afro-pessimism on the quality of South African Science and Technology (S&T) capabilities.</p> <p>The impact should the risk materialise are: (a) reduced follow up on projects and damage to relationships with partners, and (b) reduced ability to deliver on Government's mandate.</p>	<p>Implement system for measurement of uptake.</p> <ul style="list-style-type: none"> • Analyse the needs of students and researchers. • Conduct awareness campaigns of what projects are available and what is required by South African students. <p>Facilitate exposure of South African researchers & students through international projects.</p>

STRATEGIC OBJECTIVE	RISK DESCRIPTION	MITIGATION ACTION
<p>To contribute towards the shaping regional, continental and global STI discourse, decision making and policy formulation using science diplomacy to ensure representation of the interests of South Africa.</p>	<p>Misalignment of international policy agenda to national, regional and continental policies, as a result of limited contributions to influence policy decisions by South Africa.</p> <p>The impact should the risk materialise are: (a) missed opportunities, and (b) reduced ability to deliver on national and regional mandate.</p>	<p>Re-prioritising of multilateral organisations.</p> <p>Re-prioritising of multilateral initiatives.</p>
<p>To support STI capacity in the African continent to create conditions for the development of a knowledge-based economy in Africa.</p>	<p>Inability to meet the demand for capacity building request by African partners leading to unstable relations, as a result of commitments not honoured by African partners.</p> <p>The impact should the risk materialise are: limited financial and non-financial support from international partners.</p>	<p>Implement the co investment model between African partners and South Africa.</p>

Programme performance indicators and annual targets for 2014/15

Table 12: Programme performance indicators and targets

Output	Performance indicator	Strategic target	Audited/Actual performance				Estimated performance 2013/14	Medium term targets		
			2010/11	2011/12	2012/13	2014/15		2015/16	2016/17	
Strategic objective: To secure STI funds to stimulate knowledge production, technology transfer, enhanced innovation and STI human capital development in pursuit of STI-based socio-economic development in South Africa.										
Foreign STI funds secured from international partners for knowledge production, technology transfer, enhanced innovation, and STI human capital development	Amount (expressed in Rand millions) of foreign STI funds secured from international partners through agreed instruments for knowledge production, technology transfer, enhanced innovation, and STI human capital development	R1 157m foreign STI funds secured from international partners through agreed instruments for knowledge production, technology transfer, enhanced innovation, and STI human capital development by 31 March 2017	R327m foreign STI funds secured	R285m foreign STI funds secured	R241,2m foreign STI funds secured	R300m foreign STI funds secured from international partners for knowledge production, technology transfer, enhanced innovation, and STI human capital development through agreed instruments by 31 March 2014	R354,6m foreign STI funds secured from international partners through agreed instruments for knowledge production, technology transfer, enhanced innovation, and STI human capital development by 31 March 2015	R388,6m foreign STI funds secured from international partners through agreed instruments for knowledge production, technology transfer, enhanced innovation, and STI human capital development by 31 March 2016	R414,2m foreign STI funds secured from international partners through agreed instruments for knowledge production, technology transfer, enhanced innovation, and STI human capital development by 31 March 2017	
National STI funds secured from international partners for knowledge production, technology transfer, enhanced innovation, and STI human capital development	Amount (expressed in Rand millions) of national STI funds secured for knowledge production, technology transfer, enhanced innovation, and STI human capital development	R285m national STI funds secured for knowledge production, technology transfer, enhanced innovation, and STI human capital development by 31 March 2017	New indicator	New indicator	New indicator	New indicator	R84,3m national STI funds secured for knowledge production, technology transfer, enhanced innovation, and STI human capital development by 31 March 2015	R91,3m national STI funds secured for knowledge production, technology transfer, enhanced innovation, and STI human capital development by 31 March 2016	R109,4m national STI funds secured for knowledge production, technology transfer, enhanced innovation, and STI human capital development by 31 March 2017	

Output	Performance indicator	Strategic target	Audited/Actual performance				Estimated performance	Medium term targets	
			2010/11	2011/12	2012/13	2014/15		2015/16	2016/17
Strategic objective: To increase South Africa's international exposure to regional, continental and global knowledge and STI networks that will result in knowledge production, technology transfer and enhanced innovation in support of the NSI.									
Regional, continental and/or global knowledge, STI networks accessed for increased international exposure of South African researchers and students	Number of specialist or joint technical workshops, policy dialogues, symposia or conferences accessed, hosted, facilitated or contributed to for participation by South African researchers and students	116 specialist or joint technical workshops, policy dialogues, symposia or conferences accessed, hosted, facilitated or contributed to for participation by South African researchers and students by 31 March 2017	New indicator	New indicator	New indicator	New indicator	32 specialist or joint technical workshops, policy dialogues, symposia or conferences accessed, hosted, facilitated or contributed to for participation by South African researchers and students by 31 March 2015	40 specialist or joint technical workshops, policy dialogues, symposia or conferences accessed, hosted, facilitated or contributed to for participation by South African researchers and students by 31 March 2016	44 specialist or joint technical workshops, policy dialogues, symposia or conferences accessed, hosted, facilitated or contributed to for participation by South African researchers and students by 31 March 2017

Output	Performance indicator	Strategic target	Audited/Actual performance			Estimated performance	Medium term targets		
			2010/11	2011/12	2012/13		2013/14	2014/15	2015/16

Strategic objective: To contribute towards the shaping of regional, continental and global STI discourse, decision making and policy formulation using science diplomacy to ensure representation of the interests of South Africa.

Initiatives led or supported by South Africa to contribute towards the shaping of regional, continental and global STI discourse, decision making and policy formulation	Number of regional, continental and/or global initiatives led by South Africa	54 regional, continental and/or global initiatives led by South Africa by 31 March 2017				New indicator	19 regional, continental and/or global initiative led by South Africa by 31 March 2015	18 regional, continental and/or global initiative led by South Africa by 31 March 2016	17 regional, continental and/or global initiative led by South Africa by 31 March 2017
	Number of DIRCO- and/or Presidency-led initiatives supported ¹⁵	78 DIRCO- and/or Presidency-led initiatives supported by 31 March 2017				New indicator	24 DIRCO- and/or Presidency-led initiatives supported by 31 March 2015	27 DIRCO- and/or Presidency-led initiatives supported by 31 March 2016	27 DIRCO- and/or Presidency-led initiatives supported by 31 March 2017
	Number of recommendations from engagements with multilateral organisations to shape national, regional and continental STI discourse and policy formulations submitted to the DST EXCO	15 recommendations from engagements with multilateral organisations to shape national, regional and continental STI discourse and policy formulations submitted to the DST EXCO by 31 March 2017				New indicator	5 recommendations from engagements with multilateral organisations to shape national, regional and continental STI discourse and policy formulations submitted to the DST EXCO by 31 March 2015	5 recommendations from engagements with multilateral organisations to shape national, regional and continental STI discourse and policy formulations submitted to the DST EXCO by 31 March 2016	5 recommendations from engagements with multilateral organisations to shape national, regional and continental STI discourse and policy formulations submitted to the DST EXCO by 31 March 2017

¹⁵ DIRCO and/or Presidency-led initiatives are international engagements like Bi-National Commissions, Joint Permanent Cooperation Commissions, the South Africa-EU Summit and other advancement of South Africa's foreign policy agenda engagements, which may include participation in incoming or outgoing delegations, participation in South African negotiation teams, or the preparation of specific documents and presentations, or organising "side events" at these high-level engagements.

Output	Performance indicator	Strategic target	Audited/Actual performance			Estimated performance 2013/14	Medium term targets		
			2010/11	2011/12	2012/13		2014/15	2015/16	2016/17
Strategic objective: To support STI capacity in the African continent to create conditions for the development of a knowledge-based economy in Africa.									
STI capacity building in the continent supported to create conditions for the development of a knowledge-based economy	Number of regional, continental and/ or multilateral governance systems supported by means of capacity building	16 regional, continental and/ or multilateral governance systems supported by means of capacity building by 31 March 2017				New indicator	6 regional, continental and/ or multilateral governance systems supported by means of capacity building by 31 March 2015	5 regional, continental and/ or multilateral governance systems supported by means of capacity building by 31 March 2016	5 regional, continental and/ or multilateral governance systems supported by means of capacity building by 31 March 2017
	Number of regional and/ or continental initiatives promoted to strengthen STI engagement with Africa	26 regional and/ or continental initiatives promoted to strengthen STI engagement with Africa by 31 March 2017				New indicator	8 regional and/ or continental initiatives promoted to strengthen STI engagement with Africa by 31 March 2015	8 regional and/ or continental initiatives promoted to strengthen STI engagement with Africa by 31 March 2016	10 regional and/ or continental initiatives promoted to strengthen STI engagement with Africa by 31 March 2017

Output	Performance indicator	Strategic target	Audited/Actual performance			Estimated performance	Medium term targets		
			2010/11	2011/12	2012/13		2014/15	2015/16	2016/17

Strategic objective: To increase participation by South Africans in international human capital development opportunities to strengthen the South African NSI.

Participation by South Africans in international human capital development opportunities to strengthen the South African NSI	Number of international human capital development opportunities accessed for participation by South African researchers and students	152 international human capital development opportunities accessed for participation by South African researchers and students by 31 March 2017				New indicator	44 international human capital development opportunities accessed for participation by South African researchers and students by 31 March 2015	50 international human capital development opportunities accessed for participation by South African researchers and students by 31 March 2016	58 international human capital development opportunities accessed for participation by South African researchers and students by 31 March 2017
	Number of South African researcher and student participants in international human capital development opportunities	4 989 South African researcher and student participants in international human capital development opportunities by 31 March 2017				New indicator	1 456 South African researcher and student participants in international human capital development opportunities by 31 March 2015	1 571 South African researcher and student participants in international human capital development opportunities by 31 March 2016	1 962 South African researcher and student participants in international human capital development opportunities by 31 March 2017

Quarterly targets for 2014/15

Table 13: Quarterly targets for the 2014/15 financial year

PERFORMANCE INDICATOR	REPORTING FREQUENCY	ANNUAL TARGET	QUARTERLY TARGETS			
			QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4
Amount of foreign STI funds secured from international partners through agreed instruments for knowledge production, technology transfer, enhanced innovation, and STI human capital development	Quarterly	R354.6m foreign STI funds secured from international partners through agreed instruments for knowledge production, technology transfer, enhanced innovation, and STI human capital development by 31 March 2015	R22m foreign STI funds secured from international partners through agreed instruments for knowledge production, technology transfer, enhanced innovation, and STI human capital development by 30 June 2014	R25m foreign STI funds secured from international partners through agreed instruments for knowledge production, technology transfer, enhanced innovation, and STI human capital development by 30 September 2014	R86m foreign STI funds secured from international partners through agreed instruments for knowledge production, technology transfer, enhanced innovation, and STI human capital development by 31 December 2014	R221.6m foreign STI funds secured from international partners through agreed instruments for knowledge production, technology transfer, enhanced innovation, and STI human capital development by 31 March 2015
Amount of national STI funds secured for knowledge production, technology transfer, enhanced innovation, and STI human capital development	Quarterly	R84.3m national STI funds secured for knowledge production, technology transfer, enhanced innovation, and STI human capital development by 31 March 2015	R14.3m national STI funds secured for knowledge production, technology transfer, enhanced innovation, and STI human capital development by 30 June 2014	R16.7m national STI funds secured for knowledge production, technology transfer, enhanced innovation, and STI human capital development by 30 September 2014	R26.3m national STI funds secured for knowledge production, technology transfer, enhanced innovation, and STI human capital development by 31 December 2014	R27m national STI funds secured for knowledge production, technology transfer, enhanced innovation, and STI human capital development by 31 March 2015
Number of specialist or joint technical workshops, policy dialogues, symposia or conferences accessed, hosted, facilitated or contributed to for participation by South African researchers and students	Quarterly	32 specialist or joint technical workshops, policy dialogues, symposia or conferences accessed, hosted, facilitated or contributed to for participation by South African researchers and students by 31 March 2015	6 specialist or joint technical workshops, policy dialogues, symposia or conferences accessed, hosted, facilitated or contributed to for participation by South African researchers and students by 30 June 2014	9 specialist or joint technical workshops, policy dialogues, symposia or conferences accessed, hosted, facilitated or contributed to for participation by South African researchers and students by 30 September 2014	8 specialist or joint technical workshops, policy dialogues, symposia or conferences accessed, hosted, facilitated or contributed to for participation by South African researchers and students by 31 December 2014	9 specialist or joint technical workshops, policy dialogues, symposia or conferences accessed, hosted, facilitated or contributed to for participation by South African researchers and students by 31 March 2015

PERFORMANCE INDICATOR	REPORTING FREQUENCY	ANNUAL TARGET	QUARTERLY TARGETS			
			QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4
Number of regional, continental and/or global initiatives led by South Africa	Quarterly	19 regional, continental and/or global initiative led by South Africa by 31 March 2015	3 regional, continental and/or global initiative led by South Africa by 30 June 2014	4 regional, continental and/or global initiative led by South Africa by 30 September 2014	8 regional, continental and/or global initiative led by South Africa by 31 December 2014	4 regional, continental and/or global initiative led by South Africa by 31 March 2015
Number of DIRCO- and/or Presidency-led initiatives supported	Quarterly	24 DIRCO- and/or Presidency-led initiatives supported by 31 March 2015	5 DIRCO- and/or Presidency-led initiatives supported by 30 June 2014	7 DIRCO- and/or Presidency-led initiatives supported by 30 September 2014	5 DIRCO- and/or Presidency-led initiatives supported by 31 December 2014	7 DIRCO- and/or Presidency-led initiatives supported by 31 March 2015
Number of recommendations from engagements with multilateral organisations to shape national, regional and continental STI discourse and policy formulations submitted to the EXCO	Quarterly	5 recommendations from engagements with multilateral organisations to shape national, regional and continental STI discourse and policy formulations submitted to the EXCO by 31 March 2015	1 recommendations from engagements with multilateral organisations to shape national, regional and continental STI discourse and policy formulations submitted to the EXCO by 30 June 2014	1 recommendations from engagements with multilateral organisations to shape national, regional and continental STI discourse and policy formulations submitted to the EXCO by 30 September 2014	2 recommendations from engagements with multilateral organisations to shape national, regional and continental STI discourse and policy formulations submitted to the EXCO by 31 December 2014	1 recommendations from engagements with multilateral organisations to shape national, regional and continental STI discourse and policy formulations submitted to the EXCO by 31 March 2015
Number of regional, continental and/or multilateral governance systems supported by means of capacity building	Quarterly	6 regional, continental and/or multilateral governance systems supported by means of capacity building by 31 March 2015	1 regional, continental and/or multilateral governance system supported by means of capacity building by 30 June 2014	2 regional, continental and/or multilateral governance systems supported by means of capacity building by 30 September 2014	1 regional, continental and/or multilateral governance systems supported by means of capacity building by 30 December 2014	2 regional, continental and/or multilateral governance systems supported by means of capacity building by 31 March 2015

PERFORMANCE INDICATOR	REPORTING FREQUENCY	ANNUAL TARGET	QUARTERLY TARGETS			
			QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4
Number of regional and/or continental initiatives promoted to strengthen STI engagement with Africa	Quarterly	8 regional and/or continental initiatives promoted to strengthen STI engagement with Africa by 31 March 2015	1 regional and/or continental initiative promoted to strengthen STI engagement with Africa by 30 June 2014	3 regional and/or continental initiatives promoted to strengthen STI engagement with Africa by 30 September 2014	2 regional and/or continental initiatives promoted to strengthen STI engagement with Africa by 31 December 2014	2 regional and/or continental initiatives promoted to strengthen STI engagement with Africa by 31 March 2015
Number of international human capital development opportunities accessed for participation by South African researchers and students	Quarterly	44 international human capital development opportunities accessed for participation by South African researchers and students by 31 March 2015	10 international human capital development opportunities accessed for participation by South African researchers and students by 30 June 2014	11 international human capital development opportunities accessed for participation by South African researchers and students by 30 September 2014	12 international human capital development opportunities accessed for participation by South African researchers and students by 31 December 2014	11 international human capital development opportunities accessed for participation by South African researchers and students by 31 March 2015
Number of South African researcher and student participants in international human capital development opportunities	Quarterly	1 456 South African researcher and student participants in international human capital development opportunities by 31 March 2015	95 South African researcher and student participants in international human capital development opportunities by 30 June 2014	568 South African researcher and student participants in international human capital development opportunities by 30 September 2014	147 South African researcher and student participants in international human capital development opportunities by 31 December 2014	646 South African researcher and student participants in international human capital development opportunities by 31 March 2015

Reconciling performance targets with the budget and MTEF

Table 14: International Cooperation and Resources expenditure estimates

R'000	Expenditure outcome			Adjusted appropriation 2013/14	Medium term expenditure estimates		
	2010/11	2011/12	2012/13		2014/15	2015/16	2016/17
Multilateral Cooperation and Africa	27 642	26 692	24 790	60 282	27 486	28 733	29 335
International Resources	39 853	42 610	44 716	50 948	54 983	57 494	57 782
Overseas Bilateral Cooperation	33 295	30 534	33 369	34 200	37 230	38 924	39 119
TOTAL	100 790	99 836	102 875	145 430	119 699	125 151	126 236
Compensation of employees	31 154	31 836	33 934	37 959	43 418	45 415	45 642
Goods and services	19 964	16 386	22 616	20 681	21 677	18 687	19 240
Transfers and subsidies	49 192	51 112	45 707	86 790	54 604	61 049	61 354
Payments for capital assets	480	502	618	-	-	-	-
TOTAL	100 790	99 836	102 875	145 430	119 699	125 151	126 236

PROGRAMME 4: RESEARCH DEVELOPMENT AND SUPPORT

Purpose: To provide an enabling environment for research and knowledge production that promotes strategic development of basic sciences and priority science areas, through science promotion, human capital development, the provision of research infrastructure and relevant research support, in pursuit of South Africa's transition to a knowledge economy.

Strategic overview

As its name implies, this Programme focuses on ensuring that South Africa's research base is maintained, strengthened and grown in order that it may contribute to the modernisation of South Africa's economy and its move toward being more knowledge-based. Specifically, this implies responsibilities to ensure the provision of the required high-level human capital and research infrastructure necessary for advanced research able to produce new knowledge, as well as ensuring ongoing support for research activities, and the development of specific support measures for basic sciences and priority science areas, especially those in which South Africa enjoys a geographic advantage.

At the level of the NSI, the impact of this Programme's work will be monitored through indicators such as –

- the contribution of South Africa's research output to global research output;
- the global impact of South Africa's research output;
- the percentage of postgraduate research students enrolling in SET programmes; and
- the annual number of doctoral graduates.

The NDP identifies education, training and innovation as being at the centre of South Africa's long-term development, and it specifically states that "inadequate capacity will constrain knowledge production and innovation unless effectively addressed".

The strategic purposes of Programme 4 directly address this imperative through support for HCD, the provision of research and innovation infrastructure, and the promotion of knowledge generation. With respect to HCD, for example, the NDP recommends that South Africa should produce more than 100 doctoral graduates per million population per year by 2030 (while we currently produce only 33), produce double the number of postgraduate and first-rate scientists, increase the number of African and women postgraduates (especially PhDs), and improve the qualifications of academic staff by increasing the percentage of PhD-qualified staff in the higher education sector from the current 43% to over 75% by 2030. Furthermore, in conjunction with the NRF, Programme 4 is the key source of research funding for universities, without which no knowledge generation or postgraduate training could take place. Lastly, this Programme manages the DST research and innovation infrastructure initiatives, a vital source of financial support to public research institutions and universities for research equipment and facilities.

Strategic objectives

- To contribute to the development of representative, high-level human capital able to pursue locally relevant, globally competitive research and innovation activities.
- To ensure availability of and access to internationally comparable research and innovation infrastructure in order to generate new knowledge and train new researchers.
- To support and promote research that develops basic sciences through production of new knowledge and relevant training opportunities.
- To strategically develop priority science areas in which South Africa enjoys a competitive advantage, by promoting internationally competitive research and training activities and outputs.
- To promote public engagement on science, technology and innovation.

Subprogrammes

Human Capital and Science Promotion formulates and implements policies and strategies that address the availability of human capital for science, technology, and innovation, and that provide fundamental support for research activities. The subprogramme provides strategic direction and support to institutions mandated with HCD and increased knowledge production, as well as interfacing with relevant stakeholders in this regard. In addition, the sub-programme is responsible for science awareness and promotion, including science and youth activities.

The Human Capital Development Strategy for Research Innovation and Scholarship (HCD RIS Strategy) was approved for consultation by the Minister at the close of the 2012/13 financial year. It is envisaged that the Department will finalise the HCD RIS Strategy in 2013/14. In 2014/15 an implementation framework will be developed for the strategy, which will be updated every year as funding and other conditions change. Relationships with key stake-holders such as the Department of Higher Education and Training will be promoted and managed to maximise delivery on this strategy.

The Department has a number of instruments that are designed to strengthen research capacity at universities, including the research chairs and centres of excellence programmes, both managed by the National Research Foundation. Special attention will be paid to monitoring and promoting these HCD programmes.

The DST-NRF Internship Programme (implemented through the NRF) gives recently qualified graduates and postgraduate students an opportunity to improve their employability by placing them at various institutions within the NSI, thus greatly improving their chances of being retained within the science system in the longer term. The internship programme also addresses government imperatives of reducing unemployment and skills development. The equity targets for the programme have been exceeded, with more than 90% of the interns placed at NSI institutions being black, and 60% being women. The DST supports a number of other work preparation programmes and the intention is to grow, streamline and systematise the implementation model of these programmes, and improve the DST's consolidated reporting on them.

In order to promote public engagement with science the DST undertakes initiatives like as the annual National Science Week. It is anticipated that the Department will have developed the South African science engagement framework aimed at promoting science awareness and engagement by 2013/14. An implementation plan for the framework will be developed during the period 2014/15 to 2015/16. The DST will grow support for the science centres which are the key infrastructure for driving science awareness and engagement, while carefully monitoring their outputs. A rural science centre is planned for development in the Cofimvaba district in the next two to three year. The Youth into Science Strategy will be reviewed between 2014/15 and 2015/16, and the relations with the Department of Basic Education will be maintained to ensure delivery on all the Department's learner-related activities.

Basic Sciences and Infrastructure facilitates the strategic implementation of research and innovation equipment and infrastructure to promote knowledge production in areas of national priority and to sustain R&D-led innovation. The subprogramme also promotes the development and strengthening of basic or foundational sciences, such as physics, chemistry, biological and life sciences, geographic and geological sciences, and the human and social sciences.

Over the period 2014/15 to 2016/17, the subprogramme will continue to support the provision of and access to RDI infrastructure across the entire NSI. The Department's ring-fenced infrastructure budget will be used to award 190 research infrastructure grants (2014/15 to 2016/17) to the research community across the country. Most of the funding will be allocated to universities, national facilities, science councils and museums through the National Equipment Programme (NEP) and the National Nanotechnology Equipment Programme (NNEP) implemented by the NRF. The infrastructure funds will also be used for the development of various initiatives such as the development of pilot plants, technology demonstrators and specialised facilities. Continued support will

also be provided to students and researchers to access global infrastructures such as the Large Hadron Collider (LHC) at the European Centre for Nuclear Research (CERN) in Switzerland, the Joint Institute for Nuclear Research in Russia and the European Synchrotron Radiation Facility (ESRF) in France.

For the period 2014/15 to 2016/17 the subprogramme will continue to support the roll-out of a gigabit per second (Gbps) capacity broadband network through the South African National Research Network (SANReN) in providing transmission of data to all research and academic institutions. For this period the average amount of bandwidth per SANReN site per annum will be increased from 2 800 Mbps in 2014/15 to 3 500 Mbps in 2016/17.

With regard to the Basic Sciences component of the subprogramme, continued support will be for about 24 research chairs in the human and social sciences, the National Institute for Theoretical Physics, and the African Institute for Mathematical Sciences. For the period 2014/15 to 2016/17 a basic sciences (natural sciences) development framework will be developed to ensure targeted support for this component of the science system.

Science Missions promotes the development of research, the production of scientific knowledge, and human capital development within science areas in which South Africa enjoys a geographic advantage. These areas include the dynamics of climate change and its impact on earth systems, Antarctic and marine research, palaeosciences, and indigenous knowledge systems.

The tabling of a Bill for the protection, promotion, development and management of IKS before Parliament by 31 March 2015 is a key deliverable in the field of IKS. The key highlight in the 2014/15 financial year for Earth Systems Science will be the joint hosting with the NRF of the 2nd National Conference on Global Change. During the coming year, the Marine and Antarctic research plans will be consolidated into one Marine and Antarctic Research Strategy, this initiative being undertaken jointly with the Department of Environment Affairs. Support to research in these regions is critical.

Astronomy supports the development of astronomical sciences around a multi-wavelength research strategy, and provides strategic guidance and support to relevant astronomy institutions in the implementation of DST astronomy programmes. Of particular relevance are the Southern African Large Telescope, the MeerKAT, the High Energy Stereoscopic System, the African Very Long Baseline Interferometry (VLBI) and the Square Kilometer Array (SKA) projects.

The construction of phase 1 of the SKA is expected to start in 2016/17. In the period leading up to the SKA construction, South Africa will build a 64-dish antennae demonstrator telescope, called the MeerKAT. The first of the 64-dish antennae of the MeerKAT will have been installed during the 2013/14 financial year, while the MeerKAT telescope and associated infrastructure, classified as a mega project, are due for completion in the 2016/17 financial year. The roll-out of the MeerKAT over the next five years is planned as follows:

- Antennae 1 and 2 qualified and acceptance test completed by June 2014.
- Array release 1 (antennae 1 to 4) completed by June 2015.
- Array release 1 science commissioning completed by September 2015.
- Array release 2 (antennae 5 to 32) completed by March 2016.
- Array release 2 science commissioning completed by June 2016.
- Array release 3 (antennae 33 to 64) completed by December 2016.
- Full array available for science by April 2017.

The African VLBI Network initiative will be enhanced by South Africa's partnership with Ghana to set up a radio telescope/observatory in Ghana. A similar initiative is being pursued with Kenya, to convert an existing 32m dish at a site in Longonot, and with Mozambique, through transferring a converted 7.6m dish donated by Telkom SA at a site in Maluana. Similar initiatives will be pursued with other SKA African partner countries, as defunct telecommunications dishes become available for conversion.

The subprogramme will also focus on finalising a multi-wavelength strategy that will begin to consolidate optical, radio and gamma ray astronomy facilities under a single astronomy programme. This strategy will be completed in the 2014/15 financial year, and rolled out over the course of the next five years. All astronomy-related human capital development initiatives will also be consolidated and contextualised within the strategic framework for multi-wavelength astronomy.

The key challenge that the subprogramme will need to address is the protection of the astronomy reserves against radio, dust and light pollution, but more specifically monitoring possible impacts on astronomy activities from fracking in the Northern Cape. The relevant stakeholders and experts will be consulted with regard to preserving the central astronomy advantage areas as new regulations and standards are proposed.

Table 15: Programme risk management: Research Development and Support

STRATEGIC OBJECTIVE	RISK DESCRIPTION	MITIGATION ACTION
<p>To contribute to the development of representative, high-level human capital able to pursue locally relevant, globally-competitive research and innovation activities.</p>	<p>Insufficient locally representative researchers and scientists coming through from master's to doctoral degrees to undertake research and innovation activities within the South African science system, because: (a) postgraduate bursaries provided are not sufficient in value and fall short of meeting the critical numbers required, (b) employment and career prospects for postgraduates are not clearly articulated and communicated (a career path for researchers has not been profiled), promoted and communicated, (c) low conversion rates of locally representative students from bachelor degrees to doctoral degrees act as a bottleneck, and (d) a suboptimal research environment discourages students to pursue their studies.</p> <p>The impacts should the risk materialise are: (a) there will be a future decline in South Africa's research and innovation outputs and (b) attempts to transform the researcher cohort will be severely hampered.</p>	<p>Monitoring the implementation of the Ministerial guidelines towards achieving equity in the distribution of bursaries, scholarships and fellowships.</p> <p>Conduct continuous analysis of bursary funding needs and the enhancement of the budget bids for increased funding.</p> <p>Conduct analysis of the contributions made by relevant departments to postgraduate funding. Convening bilateral meetings with relevant departments on postgraduate funding and supporting the next generation of academics.</p> <p>Hosting of Women in Science Awards (WISA); NRF Presidents Awards, Academy of Science of South Africa (ASSAf) Young Scientists awards, National Science Week and promotional/advocacy events around them.</p> <p>Conduct a study to understand the root causes for students to pursue further postgraduate studies.</p> <p>Include in bursary support funding for students' research projects.</p> <p>Implement Graduate Assistanceship: internships for postgraduate students within universities.</p>

STRATEGIC OBJECTIVE	RISK DESCRIPTION	MITIGATION ACTION
<p>To ensure availability of and access to internationally comparable research and innovation infrastructure in order to generate new knowledge and train new researchers.</p>	<p>Mismatch of the available funding with infrastructure needs (with infrastructure needs referring to the maintenance of existing infrastructure and the expansion of new infrastructure), as a result of: (a) insufficient levels of planning for research infrastructure investment by the SET community, (b) low levels of private sector R&D funding in SA, (c) low levels of own investment by universities, (d) historical under-investment in research infrastructure leading to high current demand in the context of competing national priorities, and (e) an increase in the applications for infrastructure exceeding the supply of the funding available</p> <p>The impacts should the risk materialise are: (a) the inability to attract researchers from around the world, (b) the inability to collaborate with other agencies, (c) the inability to generate new knowledge and innovation, (d) the inability to provide adequate training (human capital development), (e) the inability to upgrade ageing infrastructure and (f) damage to the department's reputation both internationally and locally.</p>	<p>To use the final South African Research Infrastructure Roadmap (SARIR) report, which articulates a comprehensive framework and foundation for the development of a national research infrastructure roadmap to guide the strategic development, acquisition and deployment of research infrastructure as a necessary and required enabler for research, development and innovation.</p> <p>To involve the private sector in the development of the national infrastructure roadmap. The process of involving the private sector is intended to result in the establishment of a public private partnership for the acquisition and implementation of RDI Infrastructure.</p> <p>Prepare annual infrastructure bids according to the DST infrastructure framework in July/August for the National Treasury MTEF process.</p>
<p>To support and promote research that develops basic sciences in South Africa through production of new knowledge and relevant training opportunities.</p>	<p>Insufficient research in and/or output from basic sciences, as a result of (a) an unintentional focus on priority areas as prescribed by the DST's strategic documents at the expense of basic sciences and (b) the inequitable allocation of human and financial resources within the department to address shortages.</p> <p>The impacts should the risk materialise are: (a) neglect of the basic sciences, (b) decline in South Africa's contribution to global knowledge outputs in basic sciences, (c) decline in new knowledge, new knowledge areas and relevant training opportunities, (d) perception that the DST is supporting strategic sciences at the expense of the basic sciences, (e) missed access to external (non-DST) funding opportunities and (f) the inability to attract scientists globally.</p>	<p>Develop a Basic Sciences (Natural Sciences) development and support framework, to ensure targeted support for this component of the science system.</p> <p>Establish leverage between the DST and the DHET programmes.</p>

STRATEGIC OBJECTIVE	RISK DESCRIPTION	MITIGATION ACTION
<p>To support and promote research that develops basic sciences in South Africa through production of new knowledge and relevant training opportunities.</p>	<p>Insufficient production of established researchers, as a result of: (a) a limited capacity to undertake research (suboptimal funding specifically for emerging researchers), (b) inadequate supervisory support and mentorship within the science system and (c) the poor scholarship culture (research not perceived to be sufficiently important by academics).</p> <p>The impacts should the risk materialise are: (a) an unrepresentative and ageing researcher cohort, (b) low research outputs in the form of publications and students and (c) the decline in supervisory support and mentorship within the science system.</p>	<p>Ramping up the emerging researcher support programmes including the postdoctoral programme.</p> <p>Strengthen leverage between the DST and the DHET programmes.</p> <p>Conduct realignment of the programme and department to ensure alignment of resources and the need to develop the priority areas.</p>
<p>To strategically develop priority science areas in which South Africa enjoys a competitive advantage, by promoting internationally-competitive research and training activities and outputs.</p>	<p>Insufficient scientific exploitation of geographic advantage and knowledge areas, as a result of (a) the absence of a comprehensive enabling environment (framework, policies, legislation and funding) to develop the priority areas such as IKS, astronomy, marine sciences, (b) insufficient delivery on mandate by relevant government departments, (c) intersecting mandates across government departments and (d) the inadequate provision of human resources within the department.</p> <p>The impacts should the risk materialise are: (a) a decline in South Africa's contribution to global knowledge outputs, (b) declining SA research reputation and competitive advantage, (c) an inadequate research infrastructure, (d) ineffective influence on relevant policy developments and (e) the inadequate exploitation of international research collaboration opportunities.</p>	<p>Development and implementation of the required frameworks, policies, legislation.</p> <p>Conduct realignment of the programme and department to ensure alignment of resources and the need to develop the priority areas.</p> <p>Development of an accreditation and certification framework for the recognition of knowledge holders.</p>

STRATEGIC OBJECTIVE	RISK DESCRIPTION	MITIGATION ACTION
<p>To promote public engagement on science, technology and innovation.</p>	<p>Ineffective management of public engagement, as a result of: (a) an ineffective liaison with stakeholders, (b) absence of a defined strategic direction for public engagement, (c) inappropriate awareness material, distribution and communication channels, (d) poor logistical support, (e) limited science content and skills amongst the available science communicators and related stakeholders and (f) the lack of science communication skills among scientists.</p> <p>The impact should the risk materialise are: (a) reputational harm to DST, (b) fruitless expenditure, (c) ineffective execution of the awareness programme, (d) under-valuation of science and (e) the inadequate public empowerment.</p>	<p>Strengthening collaboration with NGOs, universities, Provincial departments of education, and municipalities.</p> <p>Finalisation of the science engagement strategy developed in the 2013/14 financial year.</p> <p>Exercise care and control in the development of the awareness materials.</p> <p>Offer training to science centre staff and festival organisers.</p> <p>Facilitate training of researchers through the NRF/ SAASTA.</p>
<p>To strategically develop priority science areas in which South Africa enjoys a competitive advantage, by promoting internationally-competitive research and training activities and outputs.</p>	<p>Suboptimal delivery of MeerKAT/SKA facilities/ infrastructure, as a result of (a) insufficient funds to complete the MeerKAT, (b) inadequate funds to operate the MeerKAT, (c) insufficient allocation of human resources to the Astronomy subprogramme, (d) insufficient R&D initiatives for the development of supporting technologies, (e) unrealistic expectations of corporate social investments in local communities and (f) the insufficient participation/slow response of SKA African partner countries.</p> <p>The impacts should the risk materialise are: (a) a reputational damage to the DST, (b) limited scientific value, (c) limited technological development and spin off, (d) social unrest and (e) fruitless expenditure.</p>	<p>Implement MeerKAT Funding Plan.</p> <p>Implement MeerKAT Operational Plan.</p> <p>Implement Astronomy subprogramme resourcing plan.</p> <p>Implement MeerKAT Technology Roadmap.</p> <p>Conduct public engagement plan for Corporate Social Investment.</p> <p>Implement SKA Readiness Strategy.</p> <p>Draft Memorandum of Understanding (MoU) with SKA African partner countries.</p>

Programme performance indicators and annual targets for 2014/15

Table 16: Programme performance indicators and targets

Output	Performance indicator	Strategic target	Audited/Actual performance			Estimated performance 2013/14	Medium term targets		
			2010/11	2011/12	2012/13		2014/15	2015/16	2016/17
Postgraduate students and fellows awarded bursaries and fellowships through NRF managed programmes	Total number of postgraduate students (BTech and honours, master's and PhD students) and postdoctoral fellows awarded bursaries as reflected in the NRF project reports	41 200 postgraduate students awarded bursaries as reflected in the NRF project reports by 31 March 2017	5 945 honours, master's, PhD students and postdoctoral fellows awarded bursaries and fellowships	7 083 postgraduate students (1 692 honours, 3 478 master's and 1 913 PhD students, and 402 postdoctoral fellows) awarded bursaries and fellowships through NRF-managed programmes	8 379 postgraduate students (2 951 honours, 3 397 master's and 2 031 doctoral) funded	11 208 postgraduate students (3 196 BTech and honours, 4 677 master's, and 2 645 PhD students) and 690 postdoctoral fellows awarded bursaries through NRF-managed programmes by 31 March 2014	11 440 postgraduate students (3 414 BTech and honours, 4 671 master's, and 2 665 PhD students) and 690 postdoctoral fellows awarded bursaries through NRF-managed programmes by 31 March 2015	14 880 postgraduate students (5 311 BTech and honours, 5 685 master's, and 3 136 PhD students) and 748 postdoctoral fellows awarded bursaries through NRF-managed programmes by 31 March 2016	14 880 postgraduate students (5 311 BTech and honours, 5 685 master's, and 3 136 PhD students) and 748 postdoctoral fellows awarded bursaries through NRF-managed programmes by 31 March 2017
Graduates and students placed in DST-funded work preparation programmes in science, engineering and technology institutions (SETI)	Total number of graduates and students placed in DST-funded work preparation programmes in SETI institutions	2 600 graduates and students placed in DST-funded work preparation programmes in SETI institutions by 31 March 2017	272 graduates and students placed in DST-funded work preparation programmes in SETI institutions	275 graduates and students placed in DST-funded work preparation programmes in SETI institutions	711 graduates and students placed in DST-funded work preparation programmes in SETI institutions	700 graduates and students placed in DST-funded work preparation programmes in SETI institutions by 31 March 2014	1 000 graduates and students placed in DST-funded work preparation programmes in SETI institutions by 31 March 2015	800 graduates and students placed in DST-funded work preparation programmes in SETI institutions by 31 March 2016	800 graduates and students placed in DST-funded work preparation programmes in SETI institutions by 31 March 2017

Strategic objective: To contribute to the development of representative, high-level human capital able to pursue locally relevant, globally competitive research and innovation activities.

Output	Performance indicator	Strategic target	Audited/Actual performance			Estimated performance 2013/14	Medium term targets		
			2010/11	2011/12	2012/13		2014/15	2015/16	2016/17

Strategic objective: To ensure availability of and access to internationally-comparable research and innovation infrastructure in order to generate new knowledge and train new researchers.

Research infrastructure grants	Number of research infrastructure grants awarded as per award letters	190 research infrastructure grants awarded by 31 March 2017	36 NRP/NNEP research equipment grants awarded	50 research infrastructure grants awarded	53 research infrastructure grants awarded	60 research infrastructure grants awarded as per award letters by 31 March 2014	60 research infrastructure grants awarded as per award letters by 31 March 2015	60 research infrastructure grants awarded as per award letters by 31 March 2016	70 research infrastructure grants awarded as per award letters by 31 March 2017
A Gigabit per second capacity broadband network providing transmission of data to all research and academic institutions	Average amount of bandwidth per SANReN site per annum	3 500 Mbps, average bandwidth per SANReN site 31 March 2017	No baseline	No baseline	No baseline	2 200 Mbps average bandwidth capacity available per SANReN site by 31 March 2014	2 800 Mbps average bandwidth capacity available per SANReN site by 31 March 2015	3 500 Mbps average bandwidth capacity available per SANReN site by 31 March 2016	3 500 Mbps average bandwidth capacity available per SANReN site by 31 March 2017

Strategic objective: To support and promote research that develops basic sciences through production of new knowledge and relevant training opportunities.

Researchers awarded research grants through NRF-managed programmes	Total number of researchers awarded research grants through NRF-managed programmes as reflected in the NRF project reports	12 954 researchers awarded research grants through NRF-managed programmes by 31 March 2017	2 600 researchers awarded research grants through NRF-managed programmes	2 886 researchers awarded research grants through NRF-managed programmes	3 076 researchers awarded research grants through NRF-managed programmes	3 822 researchers awarded research grants through NRF-managed programmes by 31 March 2014	3 876 researchers awarded research grants through NRF-managed programmes by 31 March 2015	4 539 researchers awarded research grants through NRF-managed programmes by 31 March 2016	4 539 researchers awarded research grants through NRF-managed programmes by 31 March 2017
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Output	Performance indicator	Strategic target	Audited/Actual performance				Estimated performance 2013/14	Medium term targets		
			2010/11	2011/12	2012/13	2014/15		2015/16	2016/17	
Internationally accredited research articles from researchers awarded research grants through NRF-managed programmes	Number of Institute for Scientific Information (ISI)-accredited research articles published by NRF-funded researchers as reflected in the NRF project reports	19 700 ISI-accredited research articles published by NRF-funded researchers as reflected in the NRF project reports by 31 March 2017	3 935 ISI accredited research articles published by NRF-funded researchers	4 777 ISI accredited research articles published by NRF-funded researchers	5 500 ISI-accredited research articles published by NRF-funded researchers	5 500 ISI accredited research articles published by NRF-funded researchers by 31 March 2014	5 700 ISI-accredited research articles published by NRF-funded researchers by 31 March 2015	7 000 ISI-accredited research articles published by NRF-funded researchers by 31 March 2016	7 000 ISI-accredited research articles published by NRF-funded researchers by 31 March 2017	

Strategic objective: To strategically develop priority science areas in which South Africa enjoys a competitive advantage, by promoting internationally competitive research and training activities and outputs.

MeerKAT antennae installed	Number of MeerKAT antennae installed as per SKA specifications	62 MeerKAT antennae installed as per SKA specifications by 31 March 2017	Construction of KAT-7 completed and KAT-7 commissioned to conduct astronomy research operations	A contract to construct roads, electrical reticulation and the MeerKAT construction site camp was awarded and the site was handed over to the contractor	MeerKAT antennae design completed as per SKA specifications by 31 March 2013	2 MeerKAT antennae designed and installed as per SKA specifications by 31 March 2014	4 new MeerKAT antennae installed as per SKA specifications by 31 March 2015	27 new MeerKAT antennae installed as per SKA specifications by 31 March 2016	31 new MeerKAT antennae installed as per SKA specifications by 31 March 2017
Strategy documents	Number of strategy documents approved by the DST-EXCO	1 STEMI promotion and engagement strategy for the NSI, and its implementation plan approved by the DST-EXCO by 31 March 2015	No baseline	No baseline	No baseline	1 STEMI promotion and engagement strategy for the NSI, approved by the DST-EXCO by 31 March 2014	1 implementation plan for the STEMI promotion and engagement strategy approved by the DST-EXCO by 31 March 2015	No target	No target

Output	Performance indicator	Strategic target	Audited/Actual performance				Estimated performance 2013/14	Medium term targets		
			2010/11	2011/12	2012/13	2014/15		2015/16	2016/17	
		Basic sciences development framework approved by EXCO by 31 March 2016	No baseline	No baseline	No baseline	No baseline	Draft basic sciences development framework approved by EXCO by 31 March 2015	Basic sciences development framework approved by EXCO by 31 March 2016	No target	
		1 Marine and Antarctic Research Strategy and implementation plan approved by DST EXCO by 30 September 2015	No baseline	No baseline	A DST EXCO approved concept document for developing an Antarctic Research Strategy Terms of reference for the development of the Marine Biology research strategy finalised by 31 March 2013	1 Antarctic Research Plan approved by the DST EXCO by 31 March 2014 1 Draft Marine Biology Research Plan presented to DST EXCO by 31 March 2014	1 Marine and Antarctic Research Strategy approved by the DST EXCO by 31 March 2015	1 Implementation Plan for the Antarctic and Marine Research Strategy approved by the DST EXCO by 30 September 2015	No target	

Output	Performance indicator	Strategic target	Audited/Actual performance			Estimated performance 2013/14	Medium term targets		
			2010/11	2011/12	2012/13		2014/15	2015/16	2016/17
	A Bill and regulations for the protection, promotion, development and management of IKS approved by Parliament by 31 March 2016	A Bill for the protection, promotion, development and management of IKS tabled before Parliament by 31 March 2015	Cabinet memorandum on draft legislation for the protection, promotion, development and management of IKS approved by the Minister by 31 March 2014	Cabinet memorandum on draft legislation not approved by the Minister	Cabinet memorandum on draft legislation approved by the Minister	Cabinet memorandum on draft legislation for the protection, promotion, development and management of IKS approved by the Minister by 31 March 2014	A Bill for the protection, promotion, development and management of IKS tabled before Parliament by 31 March 2015	Regulations on the protection of IKS approved by the Minister by 31 March 2016	No target
	Multi-wavelength Astronomy strategy and implementation plan approved by the DST EXCO by 31 March 2016	Multi-wavelength Astronomy strategy approved by the DST EXCO by 31 December 2014	Draft inputs to multi-wavelength Astronomy strategy made by the stakeholders by 31 March 2014	No baseline	No baseline	Draft inputs to multi-wavelength Astronomy strategy made by the stakeholders by 31 March 2014	Multi-wavelength Astronomy strategy approved by the DST EXCO by 31 December 2014	Implementation plan for multi-wavelength astronomy strategy approved by DST EXCO by 31 March 2016	No target

Strategic objective: To promote public engagement on science, technology and innovation.

Participants ¹⁶ in science awareness and engagement programmes managed by the NRF and other service providers	Total number of participants in science awareness and engagement programmes as reflected in the NRF project reports and those of other service providers	3 121 160 people participated in science awareness and engagement programmes by 31 March 2017	252 776 people participated in science awareness and engagement programmes	751 217 people participated in science awareness & engagement programmes	385 000 participants (331 000 learners, 54 000 members of the public) in science awareness and engagement programmes	904 646 participants (876 250 learners, 28 396 members of the public) in science awareness and engagement programmes by 31 March 2014	942 160 participants (566 000 learners, 376 000 members of the public) in science awareness and engagement programmes by 31 March 2015	979 000 participants (588 000 learners, 391 000 members of the public) science awareness and engagement programmes by 31 March 2016	1 200 000 participants (720 learners, 480 000 members of general public) in science awareness and engagement programmes by 31 March 2017
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¹⁶ Measured by visitors to sites hosting awareness and engagement activities, or number of people reached through media.

Quarterly targets for 2014/15

Table 17: Quarterly targets for 2014/15 financial year

PERFORMANCE INDICATOR	REPORTING FREQUENCY	ANNUAL TARGET	QUARTERLY TARGETS			
			QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4
Total number of postgraduate students (BTech and honours, master's and PhD students) and postdoctoral fellows awarded bursaries as reflected in the NRF project reports	Quarterly	11 440 postgraduate students (3 414 BTech and honours, 4 671 master's, and 2 665 PhD students) and 690 postdoctoral fellows awarded bursaries through NRF-managed programmes by 31 March 2015	7 700 postgraduate students and 300 postdoctoral fellows awarded bursaries through NRF- managed programmes by 30 June 2014	9 000 postgraduate students and 400 postdoctoral fellows awarded bursaries through NRF- managed programmes by 30 September 2014	10 000 postgraduate students and 500 postdoctoral fellows awarded bursaries through NRF- managed programmes by 31 December 2014	10 750 postgraduate students and 690 postdoctoral fellows awarded bursaries through NRF- managed programmes by 31 March 2015
Total number of graduates and students placed in DST-funded work preparation programmes in SETI institutions	Annually	1000 graduates and students placed in DST-funded work preparation programmes in SETI institutions by 31 March 2015	No target	No target	No target	1000 graduates and students placed in DST-funded work preparation programmes in SETI institutions by 31 March 2015
Number of research infrastructure grants awarded as per award letters	Bi-annually	60 research infrastructure grants awarded as per award letters by 31 March 2015	No target	Call for proposals on awarding of research infrastructure grants issued by 30 September 2014	No target	60 research infrastructure grants awarded as per award letters by 31 March 2015
Average amount of bandwidth per SANReN site per annum	Bi-annually	2 800 Mbps average bandwidth capacity availability per SANReN site by 31 March 2015	No target	Revised sites connectivity plan concluded by 30 September 2014	No target	2 800 Mbps average bandwidth capacity availability per SANReN site by 31 March 2015

PERFORMANCE INDICATOR	REPORTING FREQUENCY	ANNUAL TARGET	QUARTERLY TARGETS			
			QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4
Total number of researchers awarded research grants through NRF-managed programmes as reflected in the NRF project reports	Quarterly	3 876 researchers awarded research grants through NRF-managed programmes by 31 March 2015	1 000 researchers awarded research grants through NRF-managed programmes as reflected in the NRF project reports by 30 June 2014	2 000 researchers awarded research grants through NRF-managed programmes as reflected in the NRF project reports by 30 September 2014	3 500 researchers awarded research grants through NRF-managed programmes as reflected in the NRF project reports by 31 December 2014	3 876 researchers awarded research grants through NRF-managed programmes as reflected in the NRF project reports by 31 March 2015
Number of Institute for Scientific Information (ISI)-accredited research articles published by NRF-funded researchers as reflected in the NRF project reports	Annually	5 700 ISI-accredited research articles published by NRF-funded researchers by 31 March 2015	No target	No target	No target	5 700 ISI-accredited research articles published by NRF-funded researchers by 31 March 2015
Number of strategy documents approved by the DST EXCO	Quarterly	1 Implementation plan for the STEMI promotion and engagement strategy for the NSI approved by DST EXCO by 31 March 2015	No target	First draft of the Science engagement strategy implementation plan developed by 30 September 2014	First draft of the Science engagement strategy implementation plan presented to the DDG by 31 December 2014	Implementation plan of the science engagement strategy approved by EXCO by 31 March 2015
		1 Marine and Antarctic Research Strategy approved by DST EXCO by 31 March 2015	First draft of the Marine and Antarctic Research Strategy completed by 30 June 2014	Approval of first draft of Strategy by DDG for submission to DST EXCO by 30 September 2014	Presentation of the draft Marine and Antarctic Research Strategy to DST EXCO by 31 December 2014	1 Marine and Antarctic Research Strategy approved by DST EXCO by 31 March 2015
		Draft basic sciences development framework approved by DST EXCO by 31 March 2015	Process plan for the preparation of the draft framework approved by the DDG by 30 June 2014	Stakeholder consultations on basic sciences conceptual framework completed by 30 September 2014	Draft basic sciences conceptual framework presented to DDG by 31 December 2014	Draft basic sciences development framework approved by DST EXCO by 31 March 2015

PERFORMANCE INDICATOR	REPORTING FREQUENCY	ANNUAL TARGET	QUARTERLY TARGETS			
			QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4
		A Bill for the protection, promotion, development and management of IKS tabled before Parliament by 31 March 2015	Publication of the Bill for the protection, promotion, development and management of IKS for public comment by 30 June 2014	No target	Report approved on public comment on the Bill for the protection, promotion, development and management of IKS by 30 October 2014	A Bill for the protection, promotion, development and management of IKS tabled before Parliament by 31 March 2015
		Multi-wavelength astronomy strategy approved by DST EXCO by 31 December 2014	Draft multi-wavelength strategy finalised by 30 June 2014	Consultation concluded on multi-wavelength strategy by 30 September 2014	Multi-wavelength strategy approved by DST EXCO by 31 December 2014	No target
MeerKAT antennae installed as per SKA specifications	Quarterly	4 new MeerKAT antennae installed as per SKA specifications by 31 March 2015	Acceptance testing for first 2 antennae completed by 30 June 2014	3rd MeerKAT antenna installed by 30 September 2014	4th MeerKAT antenna installed by 31 December 2014	Array release of MeerKAT antennae 1 to 4 completed by 31 March 2015
Total number of participants in science awareness and engagement programmes as reflected in the NRF project reports and those of other service providers	Quarterly	942 160 participants in science awareness and engagement programmes by 31 March 2015	Grant funding awarded to organisations implementing the initiatives by 30 June 2014	National Science Week conducted by 30 September 2014	3 science festivals & 6 STEMI Olympiads & competitions conducted by 31 December 2014	4 science festivals conducted & annual report on people's participation in science centres received by 31 March 2015

Reconciling performance targets with the budget and MTEF

Table 18: Research Development and Support expenditure estimates

R'000	Expenditure outcome			Adjusted appropriation 2013/14	Medium term expenditure estimates		
	2010/11	2011/12	2012/13		2014/15	2015/16	2016/17
Human Capital and Science Promotion	1 184 150	1 357 863	1 413 926	1 693 615	1 874 660	2 364 171	2 377 790
Basic Sciences and Infrastructure	476 481	51 0764	561 350	723 497	774 088	1 018 309	1 023 421
Science Missions	84 238	107 492	147 749	160 878	176 804	184 672	185 666
Astronomy	23 642	27 212	243 598	655 842	678 210	732 974	736 790
TOTAL	1 768 511	2 003 331	2 366 623	3 233 832	3 503 762	4 300 126	4 323 667
Compensation of employees	22 016	21 619	21 179	26 165	27 502	29 150	29 352
Goods and services	11 388	10 945	7 699	11 099	10 168	11 180	11 739
Transfers and subsidies	1 734 824	1 970 417	2 337 445	3 196 568	3 466 092	4 259 796	4 282 576
Payments for capital assets	283	350	289	-	-	-	-
Payments for financial assets			11	-	-	-	-
TOTAL	1 768 511	2 003 331	2 366 623	3 233 832	3 503 762	4 300 126	4 323 667



PROGRAMME 5: SOCIO-ECONOMIC INNOVATION PARTNERSHIPS

Purpose: This Programme enhances the growth and development priorities of government through targeted S&T-based innovation interventions and the development of strategic partnerships with other government departments, industry, research institutions and communities.

Interventions include high potential R&D-led industrial development programmes, technology support programmes for industry, introducing new approaches to government service delivery and planning, strengthening science-based policy development and decision-making, demonstrating technology-led opportunities for creating sustainable jobs and wealth creation, and strengthening the contribution of technology in sustainable human settlements. Current interventions supported by the Programme are aligned to the priorities of the NDP and the twelve priority outcomes of government. .

Strategic objectives

- Through knowledge, evidence and learning, to inform and influence¹⁷ how science and technology can be used to achieve inclusive development.
- To identify, grow and sustain niche high-potential STI capabilities for sustainable development and the greening of society and the economy.
- To identify, grow and sustain niche high-potential STI capabilities that improves the competitiveness of existing and emerging economic sectors and that facilitates the development of new targeted industries with growth potential in aerospace, advanced manufacturing, chemicals, mining, advanced metals and ICTs.
- To enhance understanding and analysis that support improvements in the functioning and performance of the NSI.

Subprogrammes

Technology Localisation Beneficiation and Advanced Manufacturing advances strategic medium and long-term sustainable economic growth and sector development priorities as well as government service delivery through the following value-adding functions:

- Investing in the long-term knowledge-generation capabilities of the NSI in targeted innovation areas.
- In partnership with other government departments and economic actors, spearheading focused efforts that exploit knowledge capabilities for economic benefit. (Economic benefit includes the development of advanced industries, improved government service delivery, improve productivity and competitiveness, and technology transfer and support to small and medium enterprises as well as manufacturing firms in the supply chains of large-scale public infrastructure development programmes.)

¹⁷ Inform and influence' – one of the responsibilities of the DST is to facilitate the use of new approaches to address a range of social challenges by using good science or deploying promising technologies that are available but may not be used for a range of reasons. However, the DST does not have the mandate or responsibility for supporting adoption of promising technology (for example, alternative building technologies). This is normally done by government departments with service delivery responsibilities (for example, providing water and energy services or building houses in a new way). The approach used by a service delivery departments, whether through direct procurement or through some policy instrument (such as a subsidy, a regulation, or by issuing standards), have a significant impact on what technologies are used. The role of the DST is to invest in projects and processes that can generate the kind of appropriate knowledge and evidence and to package the knowledge and evidence in ways that support decision making by government, communities, and other role-players. In many instances, knowledge and evidence will need to be shared through structured learning opportunities such as conferences, workshops and decision-support systems.

Sector Innovation and Green Economy provides policy, strategy and direction-setting support for R&D-led growth of strategic sectors of the economy and to enhance science and technology capacity to support a transition to a green economy through the following:

- Facilitating the implementation of high-impact S&T interventions.
- Identifying and initiating science and technology programmes that support the growth of the environmental technologies and services sector in South Africa.
- Facilitating policy and strategy development on R&D interventions that support the growth of the ICT sector (excluding the ICT retail sector).
- Providing innovation policy and planning support to economic actors in priority economic sectors and provincial and local governments.

Innovation for Inclusive Development supports the experimentation of S&T-based innovations for tackling poverty including the creation of sustainable job and wealth opportunities, building sustainable human settlements, and enhancing the delivery of basic services. The subprogramme focuses on mature technologies that do not yet have widespread application, but are seen as having the potential to achieve government's broad development objectives. The focus is on supporting the widespread adoption and use of promising S&T-based innovation by supporting the generation of practical knowledge and insights, producing suitable policy evidence, introducing decision-support tools, and building capacity.

Science and Technology Investment leads and supports the development of indicators and instruments for measuring and monitoring investments in S&T and the performance of the NSI, and ways of strengthening the NSI and innovation policy. This includes an annual R&D survey, innovation measurement, the development of S&T indicators, the development of databases and information systems such as the Research Information Management System (RIMS) and national S&T expenditure tables, and the implementation of section 11D of the Income Tax Act, 1962, to promote private sector R&D investment.

Table 19: Programme Risk Management- Socio-Economic Innovation Partnerships

STRATEGIC OBJECTIVE	RISK DESCRIPTION	MITIGATION ACTION
<p>Through knowledge, evidence and learning, to inform and influence how science and technology can be used to achieve inclusive development</p>	<p>DST makes an investment that does not contribute to national development objectives, as a result of (a) changes in politics, economics and social agendas, (b) limited rigour in project selection as there is no framework for the evaluation of projects, (c) inadequate understanding and interpretation of the socio-economic policy environment, (d) inadequate understanding of needs of stakeholders or beneficiaries, and (e) continued exclusive engagement of limited implementing agents thus failing to tap into expertise and opportunities presented by alternative industry role-players.</p> <p>The impact should the risk materialise would be (a) failure of departments responsible for large-scale implementation to take note of Programme 5's advice, (b) opportunity cost of investment in projects with lower returns instead of others with higher, (c) portfolio makes limited impact on socio-economic development and reduces funding received, (d) the role of the DST in driving STI led socio-economic development is marginalised, (e) missed opportunities, (f) programme 5 does not influence technology based options as it should or improve service delivery and other objectives, (g) low uptake of solutions by relevant departments and institutions, and (h) reputation with other stakeholders is compromised.</p>	<p>Conduct continuous analysis of political and socio-economic agendas.</p> <p>Improve the project selection process and project management framework.</p> <p>Projects must be preceded by information on who will be influenced by the application of the technology.</p> <p>Build capacity for policy analysis, new posts advertised will have preferences for people with policy skills.</p> <p>Perform gap/steep analysis.</p> <p>Finalise the stakeholder engagement process.</p>

STRATEGIC OBJECTIVE	RISK DESCRIPTION	MITIGATION ACTION
<p>Through knowledge, evidence and learning, to inform and influence how science and technology can be used to achieve inclusive development</p>	<p>Failure to obtain and disseminate adequate and relevant knowledge and evidence for informing and influencing, as a result of (a) inadequate skills in experimental design for each core field of science and technology within a project, (b) not articulating information and knowledge needs prior to commencement of a project, (c) narrow conceptualisation and inadequate validation of project design and knowledge generation throughout the project lifecycle, (d) over-emphasising technology factors and failing to recognise social factors that might influence the project's success, and (e) no balance between experimental nature of demonstrator projects and adequate knowledge generation.</p> <p>The impact should the risk materialise would be (a) failure of projects to deliver adequate evidence based information to influence policy decisions and contribute to informing and influencing technology-based options, (b) end users misled by information and knowledge generated by demonstrator projects, (c.) no or inadequate return on investment in projects, and (d.) increased cost and project duration.</p>	<p>Ensure that all projects have functional steering Committees.</p> <p>Formalised process of more rigorously defining knowledge needs prior to project commencement.</p> <ul style="list-style-type: none"> • Interdisciplinary and up skilling of the expert review panel. • Develop a framework with a systematic process for project design and selection. <p>Need to separate project management from policy analysis in terms of how to defuse technology and bring two skill sets together.</p>
<p>Through knowledge, evidence and learning, to inform and influence how science and technology can be used to achieve inclusive development</p>	<p>Low levels of mainstreaming and up-scaling of projects among key government partners (e.g. municipal councils and implementation agencies), as a result of a lack of communication between the DST and departments responsible for service delivery.</p> <p>The impact should the risk materialise be (a) project closure and possible fruitless and wasteful expenditure, and (b) low technology uptake by relevant implementing departments and potential failure to achieve wider impact.</p>	<p>Participation within, and support to, the implementation processes related to the 23 priority district Municipalities.</p> <p>Budgeting and planning for Mark I, Mark II and Mark III grades of demonstrator projects as supported via policy briefs and case studies.</p> <p>Defining project objectives as per individual project.</p> <p>Developing a stakeholder engagement Plan and doing a proper scan of the environment for role-players, service providers and stakeholders within the industries we operate.</p>

STRATEGIC OBJECTIVE	RISK DESCRIPTION	MITIGATION ACTION
<p>To identify, grow and sustain a portfolio of niche high-potential science, technology and innovation capabilities for sustainable development and the greening of society and the economy.</p>	<p>Failure to build an adequate portfolio of projects that supports and promotes sustainable development and the greening of society and the economy, as a result of (a) evolving area within public policy, (b) inadequate internal DST coordination, (c) no roadmap for the DST interventions, (d) lack of mutual understanding of what needs to be done during the scoping stage of a programme, and (e) poorly designed contracts with implementing agencies.</p> <p>The impact should the risk materialise would be (a) the DST being excluded from the sustainability and green economy space, (b) failure to align DST investments with national strategy, leading to poor return on investment, (c) missed opportunities for optimised and meaningful contribution, (d) lack of adequate capabilities to play a significant role, and (e) misunderstanding of the DST requirements and expectations by implementing agencies.</p>	<p>Ensure participation at inter-governmental task teams, project steering Committees, etc.</p> <ul style="list-style-type: none"> • Popularise what is being achieved in the research programme called Global Change, Society and Sustainability (GCSS). • Link Global Change Research Plan to the Waste and Water RDI roadmaps. <p>Joint planning and implementation of projects between programmes.</p> <p>Facilitate structured meetings between the parties.</p> <p>Improve the quality of contracts with implementing agencies.</p>

STRATEGIC OBJECTIVE	RISK DESCRIPTION	MITIGATION ACTION
<p>To enhance understanding and analysis that support improvements in the functioning and performance of the National System of Innovation.</p>	<p>Statistics and indicators produced by the Programme do not adequately meet policy requirements, as a result of (a) global measurement practices and instruments not adequately customised for South African policy conditions, (b) inadequate analysis of needs of policy makers for indicators, (c) inadequate analysis of needs of users, and (d) policy requirements are not measurable or able to be translated into indicators.</p> <p>The impact should the risk materialise would be (a) gaps in understanding of the strengths, weaknesses and functioning of the NSI, (b) inappropriate policy recommendations, and (c) reduced DST ability to steer NSI.</p>	<ul style="list-style-type: none"> • Adaptation of international instruments to the local environment (Frascati Manual). • Conduct evaluation to align indicators and systems of data generation with policy requirements. • Conduct policy dialogue with user community RIMS annual User Group Meeting; facilitate R&D and Innovation survey review workshops. <p>Mentoring and coaching to be formalised and implemented at more senior levels.</p> <p>Facilitate user workshops and regular meetings with users (DST, other government departments, Science Councils, Policy researchers and Universities) to refine measurement instruments.</p> <p>Extract more value from international arrangements.</p> <p>Extract more value from expert advice.</p>
<p>To enhance understanding and analysis that support improvements in the functioning and performance of the National System of Innovation.</p>	<p>Production of poor quality (e.g. delayed or inaccurate) statistics, as a result of (a) no timeliness (frequency and punctuality of delivery) of new data and statistics and analytical information, (b) no budget of properly measuring all indicators, (c) low accuracy level of produced statistics, (d) inappropriateness of measuring tools, and (e) inadequate institutional arrangements to support statistical production, analysis and evaluation.</p> <p>The impact should the risk materialise would be (a) gaps in the understanding of the strengths, weaknesses and functioning of the NSI, (b) lack of credibility, and (c) inappropriate policy recommendations and decisions.</p>	<p>Regularly monitor adherence to timelines by Science and Technology (S&T) indicators unit and Research and Development (R&D planning unit).</p> <p>Evaluate adequacy of the budget against measurement requirements.</p> <p>Establishing the benchmarks/standards for assessing quality of each statistical quality.</p> <p>Undertake needs analysis of the measurement tools and implement the tools.</p> <p>Implementation of the Research and innovation vote.</p>

STRATEGIC OBJECTIVE	RISK DESCRIPTION	MITIGATION ACTION
<p>To identify, grow and sustain a portfolio of niche high-potential R&D capabilities that improves the competitiveness of existing and emerging economic sectors and that facilitates the development of new targeted industries with growth potential in aerospace, advanced manufacturing, chemicals, mining and advanced metals and ICTs.</p>	<p>Having a portfolio of projects that does not have the potential to impact on industrial development, as a result of (a) uncertainty about the required long-term risk and returns associated with the on investment and commitment required, (b) inadequate projections and estimations of project duration, risk and cost, and (c) limited understanding or misinterpretation of the environment and needs of stakeholders, leading to a random/subjective approval of projects.</p> <p>The impact should the risk materialise would be (a) the role of the DST in driving the R&D led industrial development programme is marginalised, which could create a space for entities to step into and thereby confusing the roles and responsibilities in the NSI, (b) impact on budget allocation, (c) missed opportunities, and (d) contribution to economic development is marginalised and value of R&D contribution remains unproven.</p>	<p>Retain close interaction with industry member societies and follow international R&D developments and achievements independently. This will help in forming an independent, but still relevant opinion regarding the projects.</p> <p>All projects must have appropriate long term plans, or be included in a strategic portfolio of projects.</p>
<p>To identify, grow and sustain a portfolio of niche high-potential R&D capabilities that improves the competitiveness of existing and emerging economic sectors and that facilitates the development of new targeted industries with growth potential in aerospace, advanced manufacturing, chemicals, mining and advanced metals and ICTs.</p>	<p>Investment in projects by DST that do not support the creation of new industry development or improve the competitiveness of existing and emerging economic sectors, as a result of (a) changes in industrial policy priorities, (b) limited rigour in project selection due to no or poor evaluation frameworks, (c) lack of continued project focus, (d) undefined or unclear exit mechanisms/milestones for projects, which could be exacerbated by the project manager's loss of objectivity, or the high level of momentum gained by historically high profile projects that were initiated without clear objectives (and therefore defined end conditions), (e) no proper stakeholder mapping or market analysis, and (f) little control over the full value/commercialisation chain associated with the R&D programme.</p> <p>The impact should the risk materialise would be (a) focused opportunity cost of investment in projects with lower returns instead of others with higher returns, (b) portfolio makes limited impact on industrial development and reduces funding received, (c) the role of the DST in driving R&D-led industrial development programme is marginalised, and (d) missed opportunities.</p>	<ul style="list-style-type: none"> • Develop Policy or frameworks for economic development approach. • Make provision of sound innovation Policy advice through Policy development forums/groups. <p>Develop a more rigorous project selection Framework with long term projections.</p> <p>Develop a more evidence based method for determining potential impact of projects.</p>
<p>To identify, grow and sustain a portfolio of niche high-potential science, technology and innovation capabilities for sustainable development and the greening of society and the economy.</p>		

STRATEGIC OBJECTIVE	RISK DESCRIPTION	MITIGATION ACTION
<p>To identify, grow and sustain a portfolio of niche high-potential R&D capabilities that improves the competitiveness of existing and emerging economic sectors and that facilitates the development of new targeted industries with growth potential in aerospace, advanced manufacturing, chemicals, mining and advanced metals and ICTs.</p>	<p>Projects not delivered as planned by implementation entities, as a result of (a) insufficient communication of indicators & targets, (b) contract is generated without clearly stating expected outputs (indicator & target) expected from the project, or without stating the reporting content and frequency, (c) insufficient monitoring and late progress reports from entities, and (d) projects not viewed as core to entities' portfolio/mandate. (entities not giving appropriate priority to projects).</p> <p>The impact should the risk materialise would be (a) missing the DST Key Performance indicators and targets, (b) queries from National Treasury and Department of Performance Monitoring and Evaluation (DPME), (c) Auditor-General audit finding and (d) reduced funding.</p>	<ul style="list-style-type: none"> Agency delivery targets needs to be clearly defined in the Operational plan. A formal letter to the agency (wherein the metric and target is defined) is to be drafted by the contracting Director, for signature by the relevant Chief Director.
<p>To identify, grow and sustain a portfolio of niche high-potential R&D capabilities that improves the competitiveness of existing and emerging economic sectors and that facilitates the development of new targeted industries with growth potential in aerospace, advanced manufacturing, chemicals, mining and advanced metals and ICTs.</p>	<p>Project selection or priorities might be biased as a result of undue influence exerted by the DST, implementing agencies, Science councils, Universities, Centres for Competence, as a result of (a) undeclared/vested interests in decisions and support of firms receiving R&D grants or projects, (b) inconsistent application of procedures, and (c) insufficient procedures and mechanisms to prevent unbiased decision making.</p> <p>The impact should the risk materialise are: (a) reputational damage, (b) qualified audit, (c) reduction in budgetary allocation, and (d) disciplinary charges.</p>	<p>Enforce mandatory signing of the "declaration of interest" forms by all members of meetings making funding recommendations or decisions needs to be formally implemented and applied.</p> <p>Audits must be frequently conducted.</p> <p>Independent evaluation of proposals for relevancy, technical proposals and value-for-money should be acquired.</p> <p>Install 'post mortem' assessment for all projects, but especially for those that failed or missed their targets.</p>

Programme performance indicators and annual targets for 2014/15

Table 20: Programme performance indicators and targets

Output	Performance indicator	Strategic target	Audited/Actual performance			Estimated performance	Medium term targets		
			2010/11	2011/12	2012/13		2014/15	2015/16	2016/17
Knowledge products ¹⁸	Number of knowledge products on technology-led opportunities for sustainable livelihoods published	8 knowledge products on technology-led opportunities for sustainable livelihoods published ¹⁹ by 31 March 2017	No baseline	No baseline	1 knowledge product was finalised (but not published)	2 knowledge products on technology-led opportunities for sustainable livelihoods published by 31 March 2014	2 knowledge products on technology-led opportunities for sustainable livelihoods published by 31 March 2015	3 knowledge products on technology-led opportunities for sustainable livelihoods published by 31 March 2016	3 knowledge products on technology-led opportunities for sustainable livelihoods published by 31 March 2017
Knowledge products	Number of knowledge products for government planning, service delivery and the building of sustainable human settlements through innovation	3 knowledge product for government planning and service delivery improvement through innovation published by 31 March 2017	No baseline	No baseline	1 knowledge product was finalised (but not published)	1 knowledge product for government planning and service delivery improvement through innovation published by 31 March 2014	1 knowledge product for government planning and service delivery improvement through innovation published by 31 March 2015	1 knowledge product for government planning and service delivery improvement through innovation published by 31 March 2016	1 knowledge product for government planning and service delivery improvement through innovation published by 31 March 2017
Decision-support interventions	Number of decision-support interventions introduced and maintained	5 decision support systems maintained and improved by 31 March 2017	No baseline	No baseline	No baseline	2 additional decision support system introduced; and two existing decision support systems maintained and improved (StepSA and R&V Atlas) by 31 March 2014	1 additional decision support systems introduced and four existing decision support systems maintained and improved by 31 March 2015	5 decision support systems maintained and improved by 31 March 2016	5 decision support systems maintained and improved by 31 March 2017

Strategic objective: Through knowledge, evidence and learning, to inform and influence how science and technology can be used to achieve inclusive development.

¹⁸ Knowledge products refer to case studies, policy briefs and technology briefs. Different knowledge products may be required to provide the knowledge and evidence required by decision-makers in order to adopt a new technology-based approach. A policy brief is a document that outlines the rationale for selecting a particular policy alternative and aims to convince the target audience that an existing problem can be addressed by adopting an alternative policy alternative or alternative course of action. A case study is a detailed description and exploration of a particular project, with a specific focus on challenges, lessons, and success factors, and is usually targeted to people involved in implementation. A technical brief refers to a range of knowledge products providing performance data, that deals with specifications or which deal with a specific technical challenge that can impact on the adoption of a particular technology. A single project or initiative can support the production of several of the knowledge products described above. Knowledge products can also be supported by a decision-support intervention. A knowledge product has to meet the needs of a particular user-community and therefore requires significant interaction to determine what would be of value

¹⁹ Published: Made public on the DST website

Output	Performance indicator	Strategic target	Audited/Actual performance			Estimated performance	Medium term targets		
			2010/11	2011/12	2012/13		2014/15	2015/16	2016/17
Learning interventions ¹⁹ (seminars, briefs and policy papers) generated	Number of learning interventions (seminars, briefs, policy papers) generated	30 learning interventions (seminars, briefs and policy papers) generated by 31 March 2017	9 policy interventions (seminars, briefs, policy papers)	No baseline	23 learning interventions (seminars, briefs and policy papers) generated	9 learning interventions (seminars, briefs and policy papers) generated by 31 March 2014	9 learning interventions (seminars, briefs and policy papers) generated by 31 March 2015	9 learning interventions (seminars, briefs and policy papers) generated by 31 March 2016	12 learning interventions (seminars, briefs and policy papers) generated by 31 March 2017

Strategic objective: To identify, grow and sustain niche high-potential STI capabilities for sustainable development and the greening of society and the economy.

High-level ²⁰ human capital developed in the dedicated niche areas (sustainable development, the greening of society and the economy)	Number of high-level research graduates (master's and doctoral students) fully funded or co-funded ²¹ in designated niche areas (sustainable development, the greening of society and the economy)	30 master's and doctoral students fully funded or co-funded in designated niche areas (sustainable development, the greening of society and the economy) by 31 March 2017	No baseline	No baseline	No baseline	No baseline	10 master's and doctoral students fully funded or co-funded in designated niche areas (sustainable development, the greening of society and the economy) by 31 March 2015	10 master's and doctoral students fully funded or co-funded in designated niche areas (sustainable development, the greening of society and the economy) by 31 March 2016	10 master's and doctoral students fully funded or co-funded in designated niche areas (sustainable development, the greening of society and the economy) by 31 March 2017
Knowledge and innovation products: patents ²² , prototypes ²³ , technology demonstrators ²⁴ and technology transfer packages,	Number of knowledge and innovation products (patents, prototypes, technology demonstrators or technology transfer packages) added to the IP portfolio through fully funded or co-funded research initiatives	5 knowledge and innovation products (patents, prototypes, technology demonstrators and technology transfer packages) added to the IP portfolio by 31 March 2017	No baseline	No baseline	No baseline	1 knowledge product (patents, prototypes, technology demonstrators and technology transfer packages) ²⁵ added to the IP portfolio by 31 March 2014	1 knowledge and innovation products (patents, prototypes, technology demonstrators and technology transfer packages) added to the IP portfolio by 31 March 2015	2 knowledge and innovation products (patents, prototypes, technology demonstrators and technology transfer packages) added to the IP portfolio by 31 March 2016	2 knowledge and innovation products (patents, prototypes, technology demonstrators and technology transfer packages) added to the IP portfolio by 31 March 2017

²⁰ In this context a learning intervention refers to a communication tool produced by policy analysts, in the form of either a seminar, brief or policy paper, which serves as an impetus for acting for the policy audience such as the cabinet or parliament etc. The intervention may also be used to support broader advocacy initiatives targeting a wide but knowledgeable audience, e.g. Clusters, decision makers, researchers and administrators.

Output	Performance indicator	Strategic target	Audited/Actual performance				Estimated performance	Medium term targets		
			2010/11	2011/12	2012/13	2014/15		2015/16	2016/17	
High level human capital development for competitiveness and new industry development built	Number of high-level research graduates (master's and doctoral students) fully funded or co-funded in designated niche areas (advanced aerospace, manufacturing, chemicals, mining, advanced metals and ICTs)	818 master's and doctoral students fully funded or co-funded in designated niche areas (advanced aerospace, manufacturing, chemicals, mining, advanced metals and ICTs) by 31 March 2017	24 master's and PhD students fully funded or co-funded in designated niche areas	99 master's and PhD students fully funded or co-funded in designated niche areas	227 master's and PhD students fully funded or co-funded	245 master's and PhD students fully funded or co-funded in designated niche areas (advanced aerospace, manufacturing, chemicals, mining, advanced metals and ICTs) by 31 March 2014	255 master's and doctoral students fully funded or co-funded in designated niche areas (advanced aerospace, manufacturing, chemicals, mining, advanced metals and ICTs) by 31 March 2015	273 master's and doctoral students fully funded or co-funded in designated niche areas (advanced aerospace, manufacturing, chemicals, mining, advanced metals and ICTs) by 31 March 2016	290 master's and doctoral students fully funded or co-funded in designated niche areas (advanced aerospace, manufacturing, chemicals, mining, advanced metals and ICTs) by 31 March 2017	
			490 interns fully funded or co-funded in R&D of design, manufacturing and product development by 31 March 2017	No baseline	No baseline	No baseline	130 interns fully funded or co-funded in R&D of design, manufacturing and product development by 31 March 2014	150 interns fully funded or co-funded in R&D of design, manufacturing and product development by 31 March 2015	160 interns fully funded or co-funded in R&D of design, manufacturing and product development by 31 March 2016	180 interns fully funded or co-funded in R&D of design, manufacturing and product development by 31 March 2017

Strategic objective: To identify, grow and sustain niche high-potential STI capabilities that improves the competitiveness of existing and emerging economic sectors and that facilitates the development of new targeted industries with growth potential in aerospace, advanced manufacturing, chemicals, mining, advanced metals and ICTs.

²¹ High level human capital refers to master and doctoral students

²² Co-funded refers to jointly funded initiatives as per agency contracts with the DST.

²³ Patents include formal disclosures (made within the entity), and provisional patent applications).

²³ A prototype is a representative model that can perform the required functions of the intended product.

²⁴ A technology demonstrator is a model that demonstrates the functional capability of a specific technology. It is at a lower level of technological maturity than a prototype as it is aimed at demonstrating only the technology functionality

²⁵ The knowledge and innovation products will be identified in consultation with implementing agencies during the financial year, as expressed in the quarterly targets

²⁶ The knowledge and innovation products will be identified in consultation with implementing agencies during the financial year, as expressed in the quarterly targets

Output	Performance indicator	Strategic target	Audited/Actual performance			Estimated performance	Medium term targets		
			2010/11	2011/12	2012/13		2014/15	2015/16	2016/17
Knowledge and innovation products: ²⁷ patents, technology demonstrators, transfer packages or prototypes generated	Number of knowledge and innovation products (patents, prototypes, technology demonstrators or technology transfer packages) added to the IP portfolio through fully funded or co-funded research initiatives	80 knowledge and innovation products (patents, technology demonstrators transfer packages or prototypes) added to the IP portfolio by 31 March 2017	7 patents and 5 technology demonstrators added to the IP portfolio	14 patents, technology demonstrators or technology transfer packages added to the IP portfolio	16 patents, technology demonstrators or technology transfer packages added	15 knowledge and innovation products (patents, technology demonstrators transfer packages or prototypes) added to the IP portfolio by 31 March 2014	20 knowledge and innovation products (patents, technology demonstrators transfer packages or prototypes) added to the IP portfolio by 31 March 2015	25 knowledge and innovation products (patents, technology demonstrators transfer packages or prototypes) added to the IP portfolio by 31 March 2016	35 knowledge and innovation products (patents, technology demonstrators transfer packages or prototypes) added to the IP portfolio by 31 March 2017
Funding instruments to increase localisation, competitiveness and R&D led industry development	Number of instruments funded in support of increased localisation, competitiveness and R&D led industry development	9 instruments funded in support of increased localisation, competitiveness and R&D led industry development by 31 March 2017				New indicator	8 instruments funded in support of increased localisation, competitiveness and R&D led industry development by 31 March 2015	8 instruments funded in support of increased localisation, competitiveness and R&D led industry development by 31 March 2016	9 instruments funded in support of increased localisation, competitiveness and R&D led industry development by 31 March 2017

Strategic objective: To enhance understanding and analysis that support improvements in the functioning and performance of the NSI.

Reports and policy briefings ²⁹ on the NSI and innovation policy published	Number of reports and policy briefings on the innovation system and innovation policy approved by DST EXCO/published	17 reports and policy briefings on the innovation system and innovation policy approved by DST EXCO or published by 31 March 2017	1 Cab Memo and 5 reports produced but not published		5 reports and policy briefings approved by DST EXCO/published by 31 March 2013	5 reports and policy briefings on the innovation system and innovation policy approved by DST EXCO/published by 31 March 2014	5 reports and policy briefings on the innovation system and innovation policy approved by DST EXCO/published by 31 March 2015	6 reports and policy briefings on the innovation system and innovation policy approved by DST EXCO/published by 31 March 2016	6 reports and policy briefings on the innovation system and innovation policy approved by DST EXCO/published by 31 March 2017
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²⁷ Knowledge generation in the SET domain is normally associated with the performance of Research and Development (R&D). A number of the programmes and activities within the DST are aimed at building capacity (knowledge, skills, and Science infrastructure) in the general sense, or at the science level where the aim is primarily towards new knowledge generation rather than the industrial application thereof. Some programmes and activities, such as those defined within Strategic Objective 4 (R&D led industry development) are aimed at performing specific R&D activities, jointly identified and based on industry needs, to unlock new markets, products or services. The outcomes of these R&D activities are aimed at innovations and increased competitiveness for the participation firms and industry sectors. The outputs of these R&D activities are therefore aimed at maturing (with the aim to apply) existing knowledge. In the APP these outputs are described as industrially relevant intellectual property, and depending on the nature of the technology development, can consist of technology packages, technology demonstrators, prototypes, pilot plants, etc

²⁸ An instrument refers to a formally established (by contract) entity (also virtual) that is used in support of R&D-led industry development

²⁹ A policy briefing in this context refers to a communication tool produced by policy analysts, in the form of either a Cabinet memorandum or evidence-based report or strategy which serves as an input for action by a defined policy audience such as Cabinet, Parliament and Portfolio Committee, the Minister of Science and Technology, provincial government, or another Minister of government department. The briefing or report may also be used to support broader advocacy initiatives targeting a wide but knowledgeable audience e.g. Economic Services and Infrastructure Cluster, decision-makers, researchers, and administrators

Quarterly targets for 2014/15

Table 21: Quarterly targets for the 2014/15 financial year

PERFORMANCE INDICATOR	REPORTING FREQUENCY	ANNUAL TARGET	QUARTERLY TARGETS			
			QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4
Number of knowledge products on technology-led opportunities for sustainable livelihoods published	Quarterly	2 knowledge products on technology-led opportunities for sustainable livelihoods published on DST website by 31 March 2015	Through consultation and review, identify the topics and format of the 2 new knowledge products by 30 June 2014	1 st draft of the 2 identified policy briefs on technology-led opportunities for sustainable livelihoods developed by 30 September 2014	Validation and engagement on the 2 policy briefs concluded by 31 December 2014	2 knowledge products on technology-led opportunities for sustainable livelihoods published on the DST website by 31 March 2015
Number of knowledge products for government planning, service delivery and the building of sustainable human settlements through innovation	Quarterly	1 knowledge product for government planning and service delivery improvement through innovation in water published by 31 March 2015	Through consultation and review, the focus of the new policy brief identified by 30 June 2014	1 st draft of the policy brief developed by 30 September 2014	Validation and engagement on policy brief concluded by 31 December 2014	1 policy brief for government planning and service delivery improvement through innovation in water published by 31 March 2015
Number of decision-support interventions introduced and maintained	Quarterly	1 additional decision support systems introduced and four existing decision support systems maintained and improved by 31 March 2015	Through consultation and engagement, confirm the focus of the one additional decision support systems that will be introduced by 30 June 2014	Finalise contracting for the additional decision support systems by 30 September 2014	Monitor the implementation of workplans for existing and new decision support systems by the project teams by 31 December 2014	1 additional systems introduced and four existing decision support systems maintained and improved by 31 March 2015
Number of learning interventions (seminars, briefs, policy papers) generated	Quarterly	9 learning interventions (seminars, briefs and policy papers) generated by 31 March 2015	Finalise schedule of policy interventions for the financial year by 30 June 2014	Ensure that implementation arrangements are finalised for the full portfolio of policy interventions by 30 September 2014	Monitor the implementation and introduce any corrective action including revision of the schedule of policy interventions by 31 December 2014	9 learning interventions (seminars, briefs and policy papers) generated by 31 March 2015

PERFORMANCE INDICATOR	REPORTING FREQUENCY	ANNUAL TARGET	QUARTERLY TARGETS			
			QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4
Number of high level research graduates (master's doctoral students) fully funded or co-funded in designated niche areas (sustainable development, the greening of society and the economy)	Quarterly	10 master's and doctoral students fully funded or co-funded in designated niche areas (sustainable development, the greening of society and the economy) by 31 March 2015	5 master's and doctoral students fully funded or co-funded in designated niche areas (sustainable development, the greening of society and the economy) by 30 June 2014	No new master's or Doctoral students funded or co-funded	No new master's or Doctoral students funded	5 master's and doctoral students fully funded or co-funded in designated niche areas (sustainable development, the greening of society and the economy) by 31 March 2015 taking the total for the financial year to 10 students
Number of knowledge and innovation products (patents, prototypes, technology demonstrators or technology transfer packages) added to the IP portfolio through fully funded or co-funded research initiatives	Quarterly	1 knowledge and innovation products (patents, prototypes, technology demonstrators or technology transfer packages) added to the IP portfolio by 31 March 2015	Begin negotiations with implementation agencies on proposed knowledge and innovation products to be added to IP portfolio by 30 June 2014	Finalise negotiations with implementation agencies on proposed knowledge and innovation products to be added to IP portfolio by 30 September 2014	Oversee and monitor the implementation as per agreed contracts with implementing agencies by 31 December 2014	1 knowledge and innovation products (patents, patent applications, prototypes, technology demonstrators or technology transfer packages) added to the IP portfolio by 31 March 2015
Number of high-level research graduates (master's and Doctoral students) fully funded or co-funded in designated niche areas (advanced manufacturing, aerospace, chemicals, mining, advanced metals and ICTs)	Quarterly	255 master's and Doctoral students fully funded or co-funded in designated niche areas (advanced manufacturing, aerospace, chemicals, mining, advanced metals and ICTs) by 31 March 2015	205 master's and Doctoral students fully funded or co-funded in designated niche areas by 30 June 2014	No new master's or Doctoral students funded or co-funded	No new master's or Doctoral students funded or co-funded	Additional 50 master's and Doctoral students fully funded or co-funded in designated niche areas (advanced manufacturing, aerospace, chemicals, mining, advanced metals and ICTs) by 31 March 2015 taking the total for the financial year to 255 students

PERFORMANCE INDICATOR	REPORTING FREQUENCY	ANNUAL TARGET	QUARTERLY TARGETS			
			QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4
Number of interns fully funded or co-funded in R&D of design, manufacturing and product development	Quarterly	150 interns fully funded or co-funded in R&D of design, manufacturing and product development by 31 March 2015	100 interns fully funded or co-funded in designated niche areas of design, manufacturing and product development by 30 June 2014	No interns funded or co-funded	No interns funded or co-funded	Additional 50 interns fully funded or co-funded in designated niche areas by 31 March 2015 taking total for the full financial year to 150 interns
Number of knowledge and innovation products (patents, prototypes, technology demonstrators or technology transfer packages) added to the IP portfolio through fully funded or co-funded research initiatives	Quarterly	20 knowledge and innovation products (patents, technology demonstrators or technology transfer packages or prototypes) added to the IP portfolio by 31 March 2015	Monitoring of signed contracts with implementing agencies and take timeous corrective action by 30 June 2014	Monitoring of signed contracts with implementing agencies and take timeous corrective action by 30 September 2014	5 knowledge and innovation products (patents, prototypes, technology demonstrators and technology transfer packages) added to the IP portfolio by 31 December 2014	15 knowledge and innovation products (patents, prototypes, technology demonstrators and technology transfer packages) added to the IP portfolio by 31 March 2015
Number of instruments funded in support of increased localisation, competitiveness and R&D led industry development	Quarterly	8 instruments funded in support of increased localisation, competitiveness and R&D led industry development by 31 March 2015	7 instruments funded in support of increased localisation, competitiveness and R&D led industry development by 30 June 2014	Continue to fund 7 instruments in support of increased localisation, competitiveness and R&D led industry development by 30 September 2014	One additional instrument funded in support of increased localisation, competitiveness and R&D led industry development by 31 December 2014, raising the total to 8.	Continued funding for 8 instruments in support of increased localisation, competitiveness and R&D led industry development by 31 March 2015

PERFORMANCE INDICATOR	REPORTING FREQUENCY	ANNUAL TARGET	QUARTERLY TARGETS			
			QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4
Number of reports and policy briefings on the innovation system and innovation policy approved by the DST EXCO/published on the DST website	Quarterly	5 reports and policy briefings approved by the DST EXCO and/or published on the DST website by 31 March 2015	Data collection for 2013/14 report on Publicly Funded research, science and innovation commenced by 30 June 2014	Completed verification and validation of data with departments by 30 September 2014	Draft 2013/14 report on Publicly Funded research, science and innovation and policy briefing presented to and approved by DST EXCO by 31 October 2014	Dissemination of findings of the 2013/14 report on Publicly Funded research, science and innovation; user consultations and review of instrument by 31 March 2015
			Administration and data preparation on R&D incentive by 30 June 2014	Draft 2013/14 report on performance of R&D tax incentive presented to DST EXCO by 30 September 2014	2013/14 report on performance of R&D tax incentive finalised and published on DST website by 31 October 2014	Administration and data preparation on R&D incentive by 31 March 2015
			Finalise 2012/13 R&D survey fieldwork by 30 June 2014	Draft report of the 2012/13 R&D survey and present the report to DST EXCO by 30 September 2014	Final 2012/13 R&D survey report published by 31 December 2014	Dissemination of the 2012/13 R&D survey report and drafting of Cabinet Memo on trends in R&D expenditure completed by 31 March 2015
			No target	Dissemination of the 2012 Innovation survey results by 30 September 2014	Policy brief based on findings of the 2012 Innovation survey User consultations and review recommendations on Innovation Survey presented to EXCO 31 December 2014	No target

Reconciling performance targets with the budget and MTEF

Table 22: Socio-Economic Innovation Partnerships expenditure estimates

R'000	Expenditure outcome			Adjusted appropriation 2013/14	Medium term expenditure estimates		
	2010/11	2011/12	2012/13		2014/15	2015/16	2016/17
Technology Localisation Beneficiation and Advanced Manufacturing	110 191	127 348	127 669	315 809	325 525	541 953	545 317
Sector Innovation and Green Economy	703 593	713 315	769 742	813 646	856 361	859 437	903 630
Innovation for Inclusive Development	254 134	287 461	315 974	330 309	353 919	370 422	372 004
Science and Technology Investment	32 446	30 935	31 976	24 646	28 341	29 537	29 685
TOTAL	1 100 364	1 159 059	1 245 361	1 486 410	1 564 146	1 801 349	1 850 636
Compensation of employees	18 568	21 342	25 240	31 928	33 881	35 428	3 7422
Goods and services	8 387	9 407	7 158	8 935	9 590	9 778	10 088
Transfers and subsidies	1 073 112	1 127 488	1 212 474	1 445 547	1 520 675	1 756 143	1 803 126
Payments for capital assets	296	639	489				
Payments for financial assets	1	183					
TOTAL	1 100 364	1 159 059	1 245 361	1 486 410	1 546 146	1 801 349	1 850 636

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Links to other plans





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LINKS TO OTHER PLANS

5. PUBLIC PRIVATE PARTNERSHIPS

Table 23: Public Private Partnerships

NAME OF PPP	PURPOSE/ DESCRIPTION OF PPP	OUTPUT (S)	CURRENT VALUE OF AGREEMENT R'000	DATE WHEN AGREEMENT EXPIRES
Industry Innovation Partnership Initiative (IIP) - Sector Innovation Fund (SIF)	To stimulate private investment in industry/ sectoral R&D through co-funding.	Contract with Forestry SA (FSA) for 2013/14 – 2016/17	R25 Million	2016/17
		Contract with Marine Industry Association of South Africa (MIASA), 2013/14 – 2016/17	R15 Million	2016/17
		Continuation of existing Post Harvest Innovation (PHI) contract with Fresh Produce Exporters' Forum (FPEF) for 2013/14 – 2016/17	R30 Million	2016/17
Post Harvest Innovation Initiative	Conduct Post harvest and cold chain research	Contract with FPEF	R30 million over six years, ending March 2014. (6yrs x R5 million)	To be extended above until 2016/17
DST and Microsoft Cooperation on ICT R&D and Innovation (RDI)	The purpose is aimed at fostering cooperation between DST and ICT multi-national companies in order to strengthen the ICT RDI Strategy objectives and the ten year ICT RDI Roadmap implementation.	<ul style="list-style-type: none"> Human capital development ICT enterprise development Technology development 	Total budget: R 2 201 800, split as R951 800 (Microsoft) and R R1 250 000 (DST/ CSIR Meraka)	Funding agreement gets renewed every year.

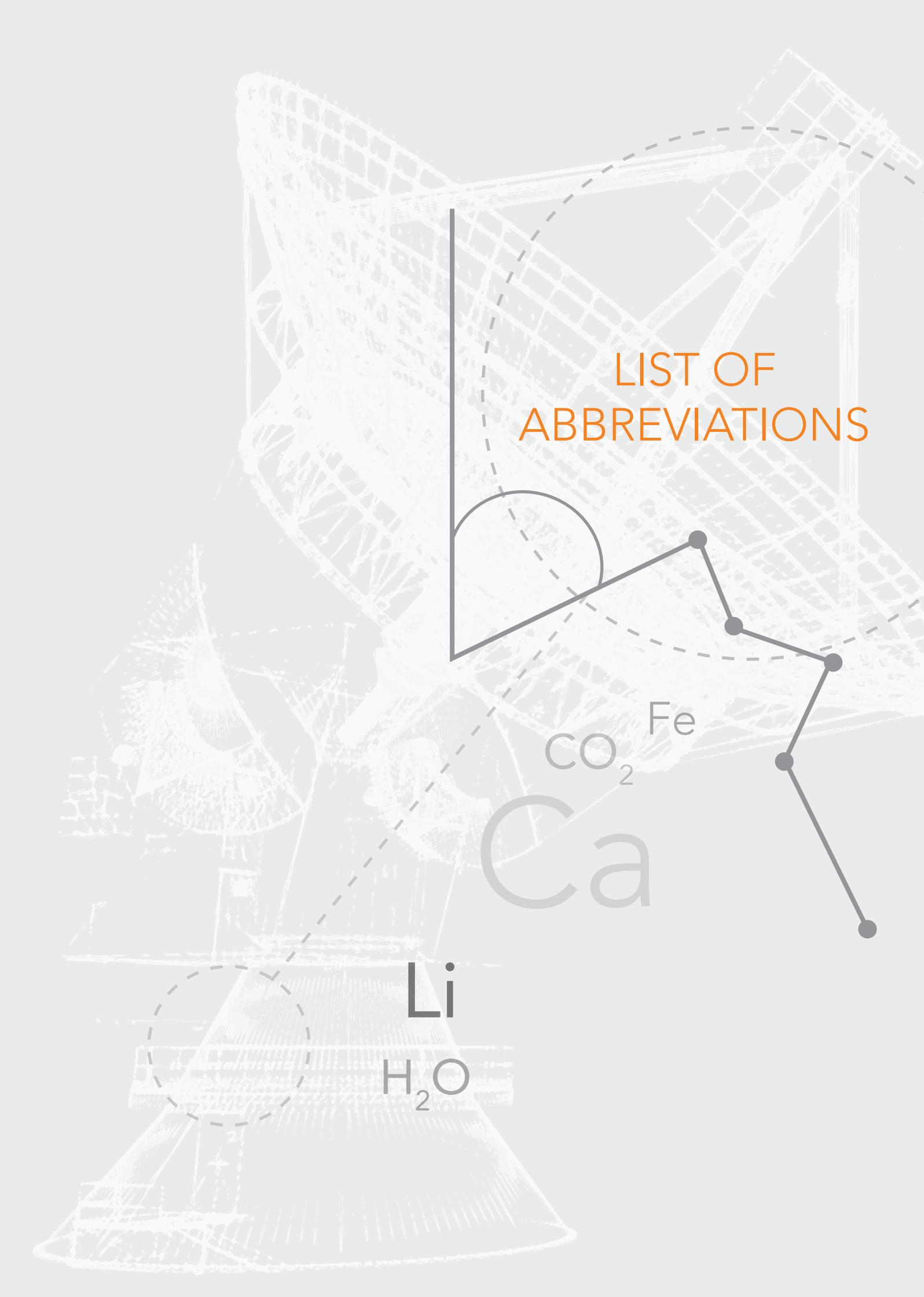
NAME OF PPP	PURPOSE/ DESCRIPTION OF PPP	OUTPUT (S)	CURRENT VALUE OF AGREEMENT R'000	DATE WHEN AGREEMENT EXPIRES
DST and SAP cooperation on Advanced ICT Human Capital Development (AHCD) programme	<p>The AHCD programme facilitates scholarships targeted especially at HDIs. It is aimed at growing a pipe line of advanced human capital skills in ICT by providing the students with practical industry experience while they are still pursuing their academic work.</p> <p>The DST/CSIR and SAP are currently working towards a collaborative initiative on the establishment of a South African "Public Cloud"</p>	<ul style="list-style-type: none"> • Human Capital Development • Technology and Services Development – mainly aimed at supporting local small enterprises. 	<p>In 2013/14 DST will provided R 4.3 million with SAP matching it and providing in kind support such as hosting the AHCD programme.</p> <p>On the "Public Cloud" collaboration, the DST has provided R 877 192 with the expectation that this will be matched or exceeded by SAP.</p>	<p>The AHCD funding contract between SAP and CSIR will terminate at the end of the calendar year 2014. The DST and two parties will have workshop in March 2014 to discuss future collaboration and extending the current collaboration.</p>
Nokia Corporation	<p>The DST and Nokia have collaborated in establishing the mLab Southern Africa (SA), which is a mobile solutions laboratory and startup accelerator that provides entrepreneurs and mobile developers with the support they need to develop innovative mobile applications and services.</p>	<p>SMMEs and entrepreneurs who are properly skilled to develop and provide mobile solutions in the consumer, design, enterprise, public and gaming sectors.</p>	<p>In 2013/14 the DST provided R2 096 545 and Nokia provided R 997 488 towards funding the mLab activities.</p>	
DST/CSIR Meraka and Cisco collaboration	<p>The DST/Meraka and Cisco collaboration is on establishing the Centre of Competence for Broadband Communication at Nelson Mandela Metro University (NMMU)</p>	<ul style="list-style-type: none"> • Established CoC at NMMU that is closely aligned with DST's CoC framework. • Advanced Human Capital • Broadband Technology Development to support and leverage on SA Broadband Strategy as well as flagship projects such as the SKA. 	<p>Indicative funding amounts: Cisco is to sponsor the CoC with equipment to the value of USD 4 million. The NMMU have requested the funding of the CoC to the amount of R2.2 million per year over four years. IIP funds could be considered for this.</p>	<p>The MoU is still being developed by the three concerned parties.</p>

7. PUBLIC ENTITIES

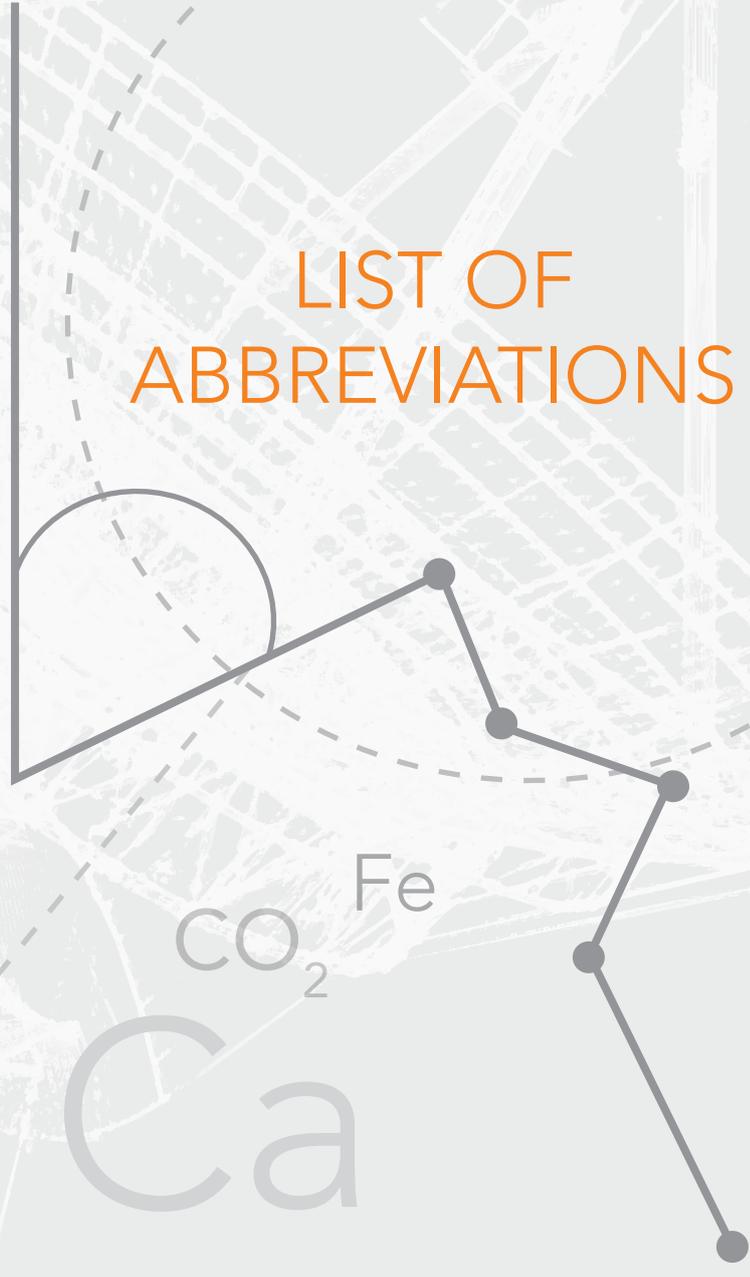
Table 24: Public entities reporting to the DST

NAME OF PUBLIC ENTITY	MANDATE	CURRENT ANNUAL BUDGET R'000	DATE OF THE NEXT EVALUATION
Academy of Science of South Africa (ASSAf)	To promote common ground in scientific thinking across all disciplines, including the physical, mathematical and life sciences, as well as human, social and economic sciences; to encourage and promote innovative and independent scientific thinking; to promote the optimum development of the intellectual capacity of all people; to provide effective advice and facilitate appropriate action in relation to the collective needs, opportunities and challenges of all South Africans; and to link South Africa with scientific communities of the highest levels, in particular within the Southern African Development Community, the rest of 30 Africa and internationally.	21 577	2016
Council for Scientific and Industrial Research (CSIR)	To foster, in the national interest and in the fields which in its opinion should receive preference, industrial and scientific development, either by itself or in cooperation with principals from the public or private sector, and thereby contribute to the improvement of the quality of life of the people of South Africa, and to perform any other functions that may be assigned to it by or under the Scientific Research Council Act.	1 029 873	2014
Technology Innovation Agency (TIA)	To stimulate and intensify technological innovation in order to improve economic growth and the quality of life of all South Africans by developing and exploiting technological innovations.	380 718	2017
South African National Space Agency (SANSA)	To provide for the promotion and use of space and cooperation in space-related activities, foster research in space science, advance scientific engineering through human capital, support the creation of an environment conducive to industrial development in space technologies within the framework of national government policy, and for that purpose to establish the South African National Space Agency; to provide for the object, and functions of the South African National Space Agency and for the manner in which it must be managed and governed; and to provide for matters connected therewith.	118 298	2014

NAME OF PUBLIC ENTITY	MANDATE	CURRENT ANNUAL BUDGET R'000	DATE OF THE NEXT EVALUATION
National Advisory Council on Innovation (NACI)	NAC I derives its mandate from the National Advisory Council on Innovation Act (Act No. 55 of 1997). Its core mandate is to advise the Minister of Science and Technology (S&T), and through her, the government of South Africa, on the role and contribution of Innovation in promoting and achieving national objectives.	18 287	2017
National Research Foundation (NRF)	To promote and support research through funding, human resource development and the provision of the necessary facilities in order to facilitate the creation of knowledge, innovation and development in all fields of research including indigenous knowledge, and thereby contribute to the improvement of the quality of life of all the people of the Republic	2 223 782	2014
Human Sciences Research Council (HSRC)	To provide for the promotion of research in the field of human sciences in order to improve understanding of social conditions and the process of social change; to provide for the continued existence of the Human Sciences Research Council; and to provide for matters connected therewith	276 010	2017



LIST OF ABBREVIATIONS



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LIST OF ABBREVIATIONS

AISA	: Africa Institute of South Africa
ASSAf	: Academy of Science of South Africa
AU	: African Union
BRICS	: Brazil Russia India China and South Africa
CoC	: Centre of Competence
CoE	: Centre of Excellence
DHET	: Department of Higher Education and Training
DIRCO	: Department of International Relations and Cooperation
DST	: Department of Science and Technology
EMI	: Electronic Magnetic Interference
EO	: Earth Observation
ERA	: Emerging Research Areas
EU	: European Union
GEOSS	: Group on Earth Observation System of Systems
HCD	: Human Capital Development
ICT	: Information Communication Technology
IKS	: Indigenous Knowledge System
IKSDCS	: Indigenous Knowledge Systems Documentation Centre
IP	: Intellectual Property
IPAP	: Industrial Policy Action Plan
ISI	: Institute for Scientific Information
M&E	: Monitoring and Evaluation
Mbps	: Mega bytes per second
MTSF	: Medium Term Strategic Framework
NDP	: National Development Plan
NEOSS	: National Earth Observation and Space Secretariat
NEP	: National Equipment Programme
NERDIS	: Nuclear Energy Research Development and Innovation Strategy

NGP	: New Growth Path
NIPMO	: National Intellectual Property Management Office
NNEP	: National Nanotechnology Equipment Programme
NRDS	: National Research and Development Strategy
NRF	: National Research Foundation
NRS	: National Recordal System
NSS	: National Space Strategy
OECD	: Organisation for Economic Cooperation and Development
OTT	: Office of Technology Transfer
PPPs	: Public Private Partnerships
R&D	: Research and Development
RDI	: Research Development and Innovation
RIMS	: Research Information Management System
SADC	: Southern African Development Community
SAEOS	: South African Earth Observation Strategy
SANEDI	: South African National Energy Development Institute
SANSA	: South African National Space Agency
SANReN	: South African National Research Network
SET	: Science Engineering and Technology
SETI	: Science Engineering Technology and Innovation
SKA	: Square Kilometre Array
SSDU	: Specialised Service Delivery Unit
STEMI	: Science Technology Engineering Mathematics and Innovation
STI	: Science Technology and Innovation
TAPs	: Technology Assistance Packages
TB	: Tuberculosis
TIA	: Technology Innovation Agency
TYIP	: Ten Year Innovation Plan
WIPO	: World Intellectual Property Organisation

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