

# Vote 31

## Science and Technology

### Budget summary

R thousand	2008/09				2009/10	2010/11
	Total to be appropriated	Current payments	Transfers and subsidies	Payments for capital assets	Total	Total
<b>MTEF allocation</b>						
Administration	105 505	101 626	2 315	1 564	123 197	133 496
Research, Development and Innovation	873 097	27 369	845 493	235	1 139 004	1 227 005
International Co-operation and Resources	129 315	47 007	82 154	154	132 339	139 354
Human Capital and Knowledge Systems	1 449 024	22 945	1 425 925	154	1 614 422	1 769 155
Socio-Economic Partnerships	1 147 031	27 682	1 119 195	154	1 188 098	1 280 229
<b>Total expenditure estimates</b>	<b>3 703 972</b>	<b>226 629</b>	<b>3 475 082</b>	<b>2 261</b>	<b>4 197 060</b>	<b>4 549 239</b>
Executive authority	Minister of Science and Technology					
Accounting officer	Director-General of Science and Technology					
Website address	www.dst.gov.za					

### Aim

*The Department of Science and Technology seeks to realise the full potential of science and technology in social and economic development, through the development of human resources, research and innovation.*

### Programme purposes, objectives and measures

#### Programme 1: Administration

**Purpose:** Conduct the overall management of the department. Ensure that the organisations funded by the department comply with good corporate governance practices and their activities are aligned with the strategic focus of the national system of innovation. Monitor and evaluate the performance of the science councils.

#### Programme 2: Research, Development and Innovation

**Purpose:** Provide policy leadership in long term and cross-cutting research and innovation in the national system of innovation, and play a key role in developing strategic new areas of focus for research and innovation in South Africa.

#### Objectives and measures:

- Promote the use of space applications for socioeconomic benefits by developing the space technology platform, which involves developing capabilities in space sensor and related technologies, by December 2008.
- Ensure that South Africa is well positioned to host the SKA by constructing the SKA demonstrator telescope (MeerKAT) by December 2012.
- Contribute to improving health outcomes by formulating the national strategy for health innovation (for the development of new drugs, vaccines, devices and diagnostics, and new techniques in process engineering and manufacturing) by November 2008.
- Address the innovation chasm by establishing the Technology Innovation Agency by December 2008.
- Drive innovation towards energy security for South Africa and the region by developing an energy research, development and innovation strategy by June 2008.

### **Programme 3: International Co-operation and Resources**

**Purpose:** Develop and monitor bilateral and multilateral relationships and agreements in science and technology to strengthen the national system of innovation and enable a flow of knowledge, capacity and resources into South Africa and Africa.

#### **Objectives and measures:**

- Increase international funding for science and technology in South Africa by increasing international research funding, foreign investment and donor support from R94 million in 2007/08 to R150 million in 2010/11.
- Increase and strengthen South African participation in multilateral organisations and forums by establishing three new programmes for student fellowships, scientist exchanges and science policy courses for South Africa and the region:
  - a science policy course for African delegates through the United Nations Educational, Scientific and Cultural Organisation (UNESCO) and the United Nations Industrial Development Organisation (UNIDO) in May 2008
  - science student camps, based on the UNESCO International School for Young Physicists, in July 2008
  - selected European Molecular Biology Conference human capital development programmes over the MTEF period.
- Increase and strengthen co-operation in Africa and with Eastern Europe, the Gulf region and Asia by establishing 10 new bilateral projects each year over the MTEF period.
- Establish the South African chapter of the African Initiative for Capacity Development (AICAD), an institution that augments the education and research function of universities and other institutions to accelerate human capital development through training and knowledge sharing, in 2008/09.

### **Programme 4: Human Capital and Knowledge Systems**

**Purpose:** Develop and implement national programmes to produce knowledge and develop human capital and the associated infrastructure, equipment and public research services.

#### **Objectives and measures:**

- Build human capital for research, development and innovation by developing a science engineering and technology (SET) human capital development strategy by May 2008.
- Increase the number of researchers by placing 210 research chairs in the national system of innovation by 2010.
- Promote investment in human capital by increasing the number of centres of excellence from 7 to 9 by 2010 and producing 3 000 SET PhDs a year by 2018.
- Provide a working research network (SANREN) for research in South Africa by connecting 3 higher institutions of education and 3 science councils.
- Improve the quality of research by placing at least 60 pieces of high value research equipment in a minimum of 20 research institutions by 2010.
- Preserve indigenous knowledge by establishing an indigenous knowledge systems databank, 2 laboratories, 2 centres of excellence, 2 new research chairs, a national bioprospecting platform, and bachelor of indigenous knowledge systems qualification by 2010.

### **Programme 5: Socio-Economic Partnerships**

**Purpose:** Serve as a strategic partner within government and with industry, contributing to South Africa's transition to a knowledge economy.

#### **Objectives and measures:**

- Develop new industries in ICT products and services, metals beneficiation, chemicals production and smart materials by initiating 1 research and development-led intervention for each by 2009.

- Support the development of policy and strategy by doing evidence-based research on 3 priority topics related to poverty alleviation and sustainable livelihoods by 2009.
- Provide scientific, strategic, and policy decision support to government, industry and broader society on the impacts of global change, and specifically on how to deal with the challenges of climate change, by implementing focused interventions by 2009, including:
  - developing a better understanding of climate variability on shorter timescales (seasonal, and over the next decade)
  - strengthening the science policy interface by developing the institutional mechanisms supporting the use of scientific research.
- Improve government decision making on science and technology as productive investments (including research and development) by producing 2 evaluation reports by 2009.

## **Strategic overview and key policy developments: 2004/05 – 2010/11**

The primary focus of the Department of Science and Technology is on implementing the national research and development strategy, with the twin objectives of creating wealth and improving quality of life. The objectives will be achieved through an integrated approach to human resource development, knowledge generation, investment in science and technology infrastructure and improving the strategic management of the public science and technology system.

### **Key policy developments**

The strategic management model for the science and technology system gave the department the role of developing emerging and rapidly changing areas of science and technology as well as co-ordinating and providing support to sector specific science and technology activities led by other government departments. This led to three key policy developments in the department: a 10-year innovation plan (2008-2018) that was supported by Cabinet in July 2007; the initiation of the process of establishing the Technology Innovation Agency (TIA) and the National Space Agency (NSA); and strengthening the governance of the national system of innovation (NSI).

The 10-year plan is built on the foundation of the NSI and proceeds from government's broad socioeconomic mandate, particularly the need to accelerate and sustain economic growth. It hinges on five key areas, termed 'grand challenges': farmer to pharma, space science and technology, energy security, global change science, and human and social dynamics.

Following the review of the NSI by the Organisation for Economic Co-operation and Development (OECD), it became imperative that the department streamline its investment in innovation activities to solidify and heighten South Africa's competitiveness in science, engineering, and technology. Establishing TIA as a vehicle to assist with the commercialisation of research results has begun, and it is anticipated that the agency will be in operation by the end of 2008/09.

After the formulation of the framework for the National Space Agency, the legislative framework was approved by Parliament in November 2007 and the agency is expected to be fully operational before the end of 2008/09. The NSA is expected to take advantage of the possibilities presented by space science and technology, which include environmental and resource management, safety and security, and strengthening the governance of the NSI. The benefits for South Africa and the rest of Africa include the provision of data and observations that enhance the understanding of climate change and broader global environmental changes.

The hydrogen and fuel cells research, development and innovation strategy was approved by Cabinet in May 2007 to create a scientific and knowledge base that will ensure broader socioeconomic benefits for South Africa from the nascent global hydrogen economy.

Investment in the development of new information systems and new science and technology indicators will strengthen strategic planning and evaluation. Currently, South Africa is not investing enough in science and

technology as a percentage of its GDP, and in 2008/09 the department aims to increase gross expenditure on research and development beyond the 1 per cent of GDP target.

### **Recent achievements**

A micro satellite, SumbandilaSAT, was completed in December 2006. When it is launched, hopefully in 2009, it will yield images used in various applications with direct social benefits, such as disaster management, crop yield estimation and improved water resource management.

The biotechnology regional innovation centres (BRICS) have supported more than 100 innovation projects and created 38 companies currently employing more than 400 people. The ICT research, development and innovation programme initiated three additional flagship programmes in human language technologies, inclusive environments, and information security, complementing the existing programmes in geomatics, ICT in education, and wireless communication technology.

The flagship programmes under the advanced manufacturing technology strategy contracted a further 23 projects in 2007/08, which will be undertaken over the MTEF period. A biofuels research and development plan was finalised in consultation with stakeholders and research institutions. The process of enhancing biofuels testing capabilities at the South African Bureau of Standards (SABS) was concluded, and results from a research intervention on biofuels by-products and co-products will assist in improving the financial sustainability of biofuels production in South Africa. A nuclear industry skills programme was developed and approved.

The South African National Energy Research Institute (SANERI) became fully operational in 2007/08. Two research chairs (biofuels and clean fossil fuels) were awarded in 2007, with a further research chair and an energy efficiency and demand side management hub to be awarded in 2007/08.

The department continues to support the provinces to improve their capacity to strategically use technological interventions to support growth and development. For example, feasibility studies on diamond beneficiation were conducted in Northern Cape and on marula processing and beneficiation in Limpopo.

The Centre for High Performance Computing has been established, as a joint initiative by the Department of Science and Technology, the Meraka Institute at the Council for Scientific and Industrial Research (CSIR), and the University of Cape Town, to provide computing power for research, development and innovation activities to research institutions, higher education institutions and industry.

Using proven technologies and supporting its role of facilitating empowerment and small scale industry development, a number of grow out aquaculture projects were initiated by the department in partnership with industry, communities, provincial governments and universities to ascertain their commercial, technical, and environmental feasibility. These included growing abalone in Hondeklip Bay in Northern Cape, silver cob in Eastern Cape, and indigenous fresh water fish (tilapia and catfish) using cage-net technology in irrigation waterworks in several provinces. Grow outs are the second stage of aquaculture projects. They are deployed to state-owned dams and funded in partnership with the Department of Water Affairs and Forestry and the Department of Agriculture.

Three sector-specific research and development studies were finalised in 2006/07 and published in 2007/08: on provincial agricultural research and development activities, research and development in the pulp and paper sector, and research and development in the sugar sector.

Following the announcement of enhanced research and development tax incentives in February 2006, in 2007/08 the department concentrated on establishing systems to make sure that once applications are received, processing will run smoothly. Information documents and forms have been developed and are available on the department's website. A tax incentive monitoring system was developed and will be operational by March 2008.

As part of the implementation of the national nanotechnology strategy, two national nanotechnology innovation centres were established to focus and concentrate efforts to build the critical mass of researchers in

nanotechnology and to fast-track South Africa's ability to develop technologies and commercialise research results emanating from this cross-cutting area. The mandate of the centres is to focus on research that has pre-identified and tangible measures. The centre at Mintek will primarily focus on research on water, health and the beneficiation of strategic minerals, and the Advanced Materials and Energy Centre at CSIR will focus on the design and modelling of novel nano-structured materials. Both centres already have strong collaborations with higher education institutions and train a significant number of student researchers enrolled for masters, doctoral and postdoctoral studies. Further collaborations with industry as partners are being forged around the potential commercialisation of anticipated research outcomes as a priority for innovation.

The South African National Research Network (SANReN) design was finalised with both Infracore and Neotel and the CSIR. The installation of the fibre links in strategic areas is ongoing, and key activities include: connecting the Meraka Institute at the CSIR with the City of Tshwane Metropolitan Municipality's fibre optic network; installing the satellite application centre and Hartebeeshoek Radio Astronomy Observatory fibre, as part of the eVLBI initiative, which will facilitate the connection of the HartRAO to the European GeANT network; and planning the installation of the fibre connection between the University of Cape Town, the Centre for High Performance Computing and iThembaLabs fibre connection.

## Selected performance indicators

Indicators	Annual performance						
	Past			Current	Projected		
	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11
Amount leveraged from international sources	R30m	R54m	R70m	R94.1m	R189m	R246m	R313m
Number of new international bilateral projects	46	55	60	64	86	106	124
Number of learners who attend the science week awareness programme	70 000	172 895	204 950	175 905	190 000	210 000	220 000
Number of students on the innovative bursary programme	–	–	–	280	415	470	550
Number of interns supported	–	–	49	68	100	110	130
Total number of centres of excellence established	6	7	7	7	8	8	8
Total number of research chairs established	–	–	21	72	72	72	72
Number of PhDs and postdoctoral fellowships supported at science councils and higher education institutions	–	–	113	107	155	180	200
Number of joint science and technology project activities between the Department of Science and Technology and other departments	–	–	2	6	14	14	14
Number of flagship projects supporting strategic areas of research and development	–	3	6	11	13	14	15

## Square Kilometre Array

South Africa and Australia are the two countries shortlisted to host the Square Kilometre Array (SKA) telescope. The final decision will be made in 2011. A milestone achievement in the South African SKA bid is the completion of the experimental development model (XDM), a prototype dish for the South African demonstrator telescope, MeerKAT. The XDM is a 15 metre diameter radio telescope antenna for the MeerKAT, which will be used to test technology leading up to the development of the SKA. Its design is intended to reduce antenna construction cost per square metre and bring it close to what is required to make the SKA affordable.

The development of the XDM is significant not only because it is the first time anywhere that an antenna of this size has been manufactured on site from composite materials for radio astronomy applications, but also because it has enabled South African industry to build specialised manufacturing competence, strengthening South Africa's participation in the global SKA community.

Since 2005, 49 postgraduate students have been awarded bursaries to study SKA related fields. 13 are enrolled for PhDs, 20 for MScs and 4 for honours. About 9 have completed their MScs.

## International Centre for Genetic Engineering and Biotechnology

The 2001 biotechnology strategy espouses research and innovation in indigenous knowledge systems and biotechnology. Over the past five years, the department's investments have made enormous contributions to harnessing development in these fields. Commonly, the results of biotechnology investments have long lead times, often up to 15 years, yet some

successes have already been reported by the biotechnology institutions. The department's goal is to expand the biotechnology platform and develop a bio-economy base.

To this end, the department's goal of expanding the biotechnology platform was given a considerable boost towards the end of 2006 when South Africa won the bid and became the first country in Africa and the third country in the world (the other two are in Italy and India) to host a laboratory of the International Centre for Genetic Engineering and Biotechnology (ICGEB). Launched by the President of South Africa at the University of Cape Town in September 2007, research at the laboratory will enable South Africa to better address: the disease burden (TB and HIV and Aids, malaria, cancer) of the developing world and Africa in particular; the challenges of poor agricultural yield, difficult climatic conditions, and enhancing post-harvest capacities; and the use of biotechnology to further develop South Africa's manufacturing and industrial sectors.

## Expenditure estimates

**Table 31.1 Science and Technology**

Programme	Audited outcome			Adjusted appropriation	Revised estimate	Medium-term expenditure estimate		
	2004/05	2005/06	2006/07	2007/08		2008/09	2009/10	2010/11
R thousand								
1. Administration	62 558	99 641	217 244	115 062	115 062	105 505	123 197	133 496
2. Research, Development and Innovation	333 499	341 218	404 767	541 301	534 301	873 097	1 139 004	1 227 005
3. International Co-operation and Resources	46 170	77 635	124 304	103 776	103 776	129 315	132 339	139 354
4. Human Capital and Knowledge Systems	521 118	639 021	876 121	1 252 079	1 252 079	1 449 024	1 614 422	1 769 155
5. Socio-Economic Partnerships	669 532	883 757	990 563	1 132 011	1 132 011	1 147 031	1 188 098	1 280 229
<b>Total</b>	<b>1 632 877</b>	<b>2 041 272</b>	<b>2 612 999</b>	<b>3 144 229</b>	<b>3 137 229</b>	<b>3 703 972</b>	<b>4 197 060</b>	<b>4 549 239</b>
Change to 2007 Budget estimate				1 750	(5 250)	64 475	108 699	215 576

### Economic classification

	2004/05	2005/06	2006/07	2007/08	2007/08	2008/09	2009/10	2010/11
<b>Current payments</b>	<b>127 140</b>	<b>173 497</b>	<b>174 004</b>	<b>246 934</b>	<b>246 934</b>	<b>226 629</b>	<b>253 562</b>	<b>269 645</b>
Compensation of employees	58 204	65 125	83 743	114 861	114 861	130 170	135 219	139 707
Goods and services	68 728	108 343	90 173	132 073	132 073	96 459	118 343	129 938
<i>of which:</i>								
Communication	4 460	4 700	6 414	8 713	8 713	7 927	8 338	8 756
Computer services	2 965	3 281	1 862	5 092	5 092	5 967	6 301	6 649
Consultants, contractors and special services	12 867	42 306	22 899	42 804	42 804	21 576	22 788	24 102
Inventory	6 219	4 180	5 880	4 124	4 124	4 141	4 375	4 617
Maintenance, repairs and running costs	160	108	186	15 728	15 728	383	405	428
Operating leases	5 108	3 626	2 990	4 344	4 344	1 524	1 612	1 700
Travel and subsistence	15 346	24 878	32 993	28 650	28 650	34 113	36 294	38 256
Financial transactions in assets and liabilities	208	29	88	-	-	-	-	-
<b>Transfers and subsidies</b>	<b>1 497 448</b>	<b>1 865 086</b>	<b>2 293 388</b>	<b>2 894 611</b>	<b>2 887 611</b>	<b>3 475 082</b>	<b>3 941 105</b>	<b>4 277 057</b>
Provinces and municipalities	171	193	64	-	-	-	-	-
Departmental agencies and accounts	730 761	809 189	1 160 159	1 639 354	1 632 354	1 927 672	2 060 740	2 299 924
Universities and technikons	16 289	32 274	45 972	13 219	13 219	10 000	20 000	21 200
Public corporations and private enterprises	471 201	596 981	740 719	589 739	589 739	550 861	578 560	614 376
Foreign governments and international organisations	11	-	-	-	-	-	-	-
Non-profit institutions	270 087	425 816	345 490	651 653	651 653	986 549	1 281 805	1 341 557
Households	8 928	633	984	646	646	-	-	-
<b>Payments for capital assets</b>	<b>8 289</b>	<b>2 689</b>	<b>145 607</b>	<b>2 684</b>	<b>2 684</b>	<b>2 261</b>	<b>2 393</b>	<b>2 537</b>
Buildings and other fixed structures	-	-	133 174	-	-	-	-	-
Machinery and equipment	8 289	2 689	12 433	2 684	2 684	2 261	2 393	2 537
<b>Total</b>	<b>1 632 877</b>	<b>2 041 272</b>	<b>2 612 999</b>	<b>3 144 229</b>	<b>3 137 229</b>	<b>3 703 972</b>	<b>4 197 060</b>	<b>4 549 239</b>

## Expenditure trends

Expenditure increased substantially, at an average annual rate of 24.4 per cent between 2004/05 and 2007/08, rising from R1.6 billion to R3.1 billion. This rate of increase is evident in all programmes but is mainly due to: increased spending on space science in the *Research, Development and Innovation* programme; improving South Africa's human capital through the human resource development initiative; funding the National Research Foundation (NRF) and establishing the South African Research Network (SANReN) in the *Human Capital and Knowledge Systems* programme; and giving support to the Council for Scientific and Industrial Research (CSIR) and other research programmes and institutions in the *Socio-Economic Partnerships* programme.

Over the MTEF period, expenditure is expected to grow at an average annual rate of 13.1 per cent to reach R4.5 billion in 2010/11. Larger increases are evident in the *Research, Development and Innovation* programme due to capital expenditure on the Square Kilometre Array (SKA) telescope, in the *Human Capital and Knowledge Systems* programme due to investment in research and development infrastructure, capital injections into frontier science and technology, and in the *Human Resource Development* programme due to the greater emphasis on raising human capital.

The 2008 Budget sets out additional allocations of R69.5 million in 2008/09, R114.7 million in 2009/10 and R221.6 million in 2010/11. The allocations will primarily provide for the increased demand for human capital development and knowledge production, building the innovation platforms, additional expenditure on science and technology infrastructure, and personnel and non-personnel inflation adjustments.

The department has identified efficiency savings of R5 million in 2008/09 and R6 million in both 2009/10 and 2010/11 due to cost saving measures mainly on travel and subsistence expenditure and telephone usage.

Infrastructure spending constitutes transfers to departmental agencies for the procurement of science and technology equipment, ICT infrastructure, and the construction and refurbishment of science and technology facilities. Transfers for infrastructure spending started in 2006/07 with a R353 million allocation, and increase from R530 million in 2007/08 to R1.1 billion 2010/11 at an average annual rate of 25.7 per cent. The main increase is attributable to research and development infrastructure and the SKA project. Additional allocations of R10 million in 2008/09, R20 million in 2009/10 and R40 million in 2010/11 are to align science and technology infrastructure with the requirements of the 10-year innovation plan.

## Infrastructure expenditure

R thousands	Outcome			Current 2007/08	Medium-term Estimates		
	2004/05	2005/06	2006/07		2008/09	2009/10	2010/11
Research equipment	-	-	50 000	50 000	70 000	74 200	78 652
Research and development infrastructure	-	-	110 000	265 000	436 106	196 659	208 459
Department of Science and Technology head office building	-	-	133 000	-	-	-	-
Frontier science and technology infrastructure	-	-	40 000	105 000	144 500	154 009	163 250
Space infrastructure	-	-	20 000	20 000	15 000	15 000	15 900
Square Kilometer Array infrastructure	-	-	-	80 000	265 000	471 900	500 214
Hydrogen strategy	-	-	-	10 000	40 500	42 525	45 077
10-year innovation plan	-	-	-	-	10 000	20 000	40 000
<b>Total infrastructure expenditure</b>	-	-	<b>353 000</b>	<b>530 000</b>	<b>981 106</b>	<b>974 293</b>	<b>1 051 552</b>

## Science and technology activities

The 2004 governance framework for science and technology sets out key elements for proper management of the science and technology base. Having taken major steps to improve the funding of science and technology in the public sector, government has set up a comprehensive database to monitor scientific and technological activities. A review of how departments use funding for science to manage scientific and technological

activities was initiated and will be compiled into the national science and technology expenditure report annually.

**Summary of expenditure on scientific and technological activities funded by the Department of Science and Technology**

R thousand	2006/07	2007/08	2008/09	2009/10	2010/11
STS	405 777	614 828	571 338	599 988	635 987
STET	24 482	35 300	49 828	61 548	65 241
STI	1 830 266	2 279 254	2 781 818	3 159 576	3 349 151
<b>Total STAs</b>	<b>2 260 525</b>	<b>2 929 382</b>	<b>3 402 984</b>	<b>3 821 112</b>	<b>4 050 379</b>

**Public institutions that undertake scientific and technological activities and which report to the Department of Science and Technology**

R thousand	2006/07	2007/08	2008/09	2009/10	2010/11
National Advisory Council on Innovation	9 132	9 757	10 351	11 949	12 666
Academy of Science of South Africa	3 000	3 400	3 820	4 003	4 243
Africa Institute of South Africa	28 879	26 530	27 830	27 122	28 749
Human Sciences Research Council	119 873	115 949	160 706	157 858	167 329
National Research Foundation	586 671	648 394	680 832	680 396	721 220
Council for Scientific and Industrial Research	483 194	507 352	534 749	561 487	595 176
<b>Total</b>	<b>1 230 749</b>	<b>1 311 382</b>	<b>1 418 288</b>	<b>1 442 815</b>	<b>1 529 384</b>

**Departmental receipts**

The department's receipts include miscellaneous items such as debt repayments and recovery of private telephone costs. The estimates for the medium term are expected to increase marginally.

**Table 31.2 Departmental receipts**

R thousand	Audited outcome			Estimate 2007/08	Medium-term receipts estimate		
	2004/05	2005/06	2006/07		2008/09	2009/10	2010/11
<b>Departmental receipts</b>	<b>302</b>	<b>229</b>	<b>1 029</b>	<b>63</b>	<b>70</b>	<b>71</b>	<b>76</b>
Sales of goods and services produced by department	17	43	301	55	61	62	66
Sales of capital assets	–	–	57	–	–	–	–
Financial transactions in assets and liabilities	285	186	671	8	9	9	10
<b>Total</b>	<b>302</b>	<b>229</b>	<b>1 029</b>	<b>63</b>	<b>70</b>	<b>71</b>	<b>76</b>

**Programme 1: Administration**

**Purpose:** Conduct the overall management of the department. Ensure that the organisations funded by the department comply with good corporate governance practices and their activities are aligned with the strategic focus of the national system of innovation. Monitor and evaluate the performance of the science councils.

**Expenditure estimates**

**Table 31.3 Administration**

Subprogramme	Audited outcome			Adjusted appropriation 2007/08	Medium-term expenditure estimate		
	2004/05	2005/06	2006/07		2008/09	2009/10	2010/11
R thousand							
Minister <sup>1</sup>	813	933	1 038	951	1 019	1 072	1 127
Deputy Minister <sup>2</sup>	780	776	865	773	828	871	916
Management	5 840	4 668	4 491	5 228	5 847	5 974	6 105
Corporate Services	51 337	88 329	206 364	99 570	89 415	106 017	115 335
Governance	1 461	2 416	2 636	5 622	5 249	5 801	6 204
Property Management	2 327	2 519	1 850	2 918	3 147	3 462	3 809
<b>Total</b>	<b>62 558</b>	<b>99 641</b>	<b>217 244</b>	<b>115 062</b>	<b>105 505</b>	<b>123 197</b>	<b>133 496</b>
Change to 2007 Budget estimate				29 740	15 480	26 059	30 529

1. Payable as from 1 April 2007. Salary: R761 053. Car allowance: R190 262.

2. Payable as from 1 April 2007. Salary: R618 566. Car allowance: R154 641.



Table 31.3 Administration (continued)

R thousand	Audited outcome			Adjusted appropriation	Medium-term expenditure estimate		
	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11
<b>Economic classification</b>							
<b>Current payments</b>	<b>55 391</b>	<b>95 183</b>	<b>70 538</b>	<b>109 174</b>	<b>101 626</b>	<b>119 092</b>	<b>129 145</b>
Compensation of employees	24 181	28 532	33 835	47 630	57 455	59 777	61 758
Goods and services	31 003	66 622	36 615	61 544	44 171	59 315	67 387
<i>of which:</i>							
Communication	2 246	2 282	3 029	2 894	1 806	1 914	2 029
Computer services	1 578	1 618	761	2 066	3 807	4 035	4 277
Consultants, contractors and special services	6 739	31 766	6 764	12 742	10 859	11 510	12 201
Inventory	2 296	2 264	2 562	2 182	2 000	2 120	2 247
Maintenance, repairs and running costs	23	86	25	15 645	338	358	379
Operating leases	4 870	3 053	2 430	3 632	775	822	871
Travel and subsistence	7 445	7 476	8 184	8 719	10 202	10 815	11 464
Financial transactions in assets and liabilities	207	29	88	–	–	–	–
<b>Transfers and subsidies</b>	<b>83</b>	<b>2 930</b>	<b>2 619</b>	<b>4 188</b>	<b>2 315</b>	<b>2 448</b>	<b>2 595</b>
Provinces and municipalities	83	87	28	–	–	–	–
Departmental agencies and accounts	–	427	–	–	–	–	–
Public corporations and private enterprises	–	8	–	–	–	–	–
Non-profit institutions	–	2 280	2 060	4 184	2 315	2 448	2 595
Households	–	128	531	4	–	–	–
<b>Payments for capital assets</b>	<b>7 084</b>	<b>1 528</b>	<b>144 087</b>	<b>1 700</b>	<b>1 564</b>	<b>1 657</b>	<b>1 756</b>
Buildings and other fixed structures	–	–	133 174	–	–	–	–
Machinery and equipment	7 084	1 528	10 913	1 700	1 564	1 657	1 756
<b>Total</b>	<b>62 558</b>	<b>99 641</b>	<b>217 244</b>	<b>115 062</b>	<b>105 505</b>	<b>123 197</b>	<b>133 496</b>
<b>Details of major transfers and subsidies</b>							
<b>Nonprofit institutions</b>							
<b>Current</b>	<b>–</b>	<b>2 280</b>	<b>2 060</b>	<b>4 184</b>	<b>2 315</b>	<b>2 448</b>	<b>2 595</b>
Technology Top 100	–	2 280	2 060	2 184	2 315	2 448	2 595
Institutional and Programme Support	–	–	–	2 000	–	–	–

## Expenditure trends

Expenditure in *Administration* increased from R62.6 million in 2004/05 to R115.1 million in 2007/08, an average annual increase of 22.5 per cent, mainly due to increased capacity in *Corporate Services*. This is evident in the number of posts, which increase from 69 in 2004/05 to 138 in 2007/08, and the concomitant average annual increase of 25.4 per cent in compensation of employees. Over the medium term the budget grows at an average annual rate of 5.1 per cent to R133.5 million in 2010/11 to cater for inflation.

## Programme 2: Research, Development and Innovation

**Purpose:** Provide policy leadership in long term and cross-cutting research and innovation in the national system of innovation. Play a key role in developing strategic new areas of focus for research and innovation in South Africa.

- *Space Science, Engineering and Technology* focuses on developing a viable space programme and earth observation systems. The subprogramme's functions include strategies to optimise chances for South Africa to win the international SKA bid.
- *Hydrogen and Energy* drives targeted research programmes in energy research, development and innovation in South Africa, including research into hydrogen and fuel cells.
- *Biotechnology and Health* develops strategies for developing a world class bio-economy in South Africa. It focuses on the innovation chasm, aiming to establish South Africa's technological capabilities to: produce

goods and services; improve competitiveness in key sectors; reduce reliance on imported technologies; and become a net exporter of local high technological products and services.

- *National Advisory Council on Innovation* funds the council, which advises the Minister of Science and Technology on all issues related to innovation.

## Expenditure estimates

**Table 31.4 Research, Development and Innovation**

Subprogramme	Audited outcome			Adjusted appropriation	Medium-term expenditure estimate		
	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11
R thousand							
Space Science	41 574	153 764	204 237	293 533	331 238	539 818	537 892
Hydrogen and Energy	16 310	21 678	13 618	31 966	300 650	325 925	400 219
Biotechnology and Health	269 115	158 075	178 114	206 560	231 430	262 689	278 125
National Advisory Council on Innovation	6 500	7 701	8 798	9 242	9 779	10 572	10 769
<b>Total</b>	<b>333 499</b>	<b>341 218</b>	<b>404 767</b>	<b>541 301</b>	<b>873 097</b>	<b>1 139 004</b>	<b>1 227 005</b>
Change to 2007 Budget estimate				(5 250)	84 297	112 537	138 950
<b>Economic classification</b>							
<b>Current payments</b>	<b>17 331</b>	<b>19 161</b>	<b>22 291</b>	<b>28 635</b>	<b>27 369</b>	<b>30 706</b>	<b>31 746</b>
Compensation of employees	7 959	7 947	9 435	16 351	14 747	15 309	15 802
Goods and services	9 372	11 214	12 856	12 284	12 622	15 397	15 944
<i>of which:</i>							
Communication	488	574	535	488	484	513	544
Computer services	393	708	46	303	42	45	48
Consultants, contractors and special services	1 527	3 499	4 882	5 888	4 418	4 684	4 965
Inventory	442	927	520	389	471	500	530
Maintenance, repairs and running costs	5	10	4	4	4	4	4
Operating leases	18	264	170	147	154	164	174
Travel and subsistence	1 801	3 372	5 993	3 583	5 424	5 750	6 095
<b>Transfers and subsidies</b>	<b>315 936</b>	<b>321 467</b>	<b>382 038</b>	<b>512 443</b>	<b>845 493</b>	<b>1 108 051</b>	<b>1 194 997</b>
Provinces and municipalities	39	23	17	–	–	–	–
Departmental agencies and accounts	43 412	42 149	151 000	172 976	214 859	221 690	265 891
Universities and technikons	–	20 929	27 324	10 000	10 000	20 000	21 200
Public corporations and private enterprises	122 875	125	30 254	–	5 000	5 786	7 033
Non-profit institutions	149 610	258 041	173 191	329 448	615 634	860 575	900 873
Households	–	200	252	19	–	–	–
<b>Payments for capital assets</b>	<b>232</b>	<b>590</b>	<b>438</b>	<b>223</b>	<b>235</b>	<b>247</b>	<b>262</b>
Machinery and equipment	232	590	438	223	235	247	262
<b>Total</b>	<b>333 499</b>	<b>341 218</b>	<b>404 767</b>	<b>541 301</b>	<b>873 097</b>	<b>1 139 004</b>	<b>1 227 005</b>
<b>Details of major transfers and subsidies</b>							
<b>Departmental agencies and accounts</b>							
<b>Departmental agencies (non-business entities)</b>							
<b>Current</b>	<b>43 412</b>	<b>42 149</b>	<b>151 000</b>	<b>172 976</b>	<b>214 859</b>	<b>221 690</b>	<b>265 891</b>
Innovation Fund	28 412	–	131 260	141 818	148 990	152 295	191 432
Institutional and Programme Support	–	1 000	100	–	–	–	–
HIV/AIDS Prevention and Treatment Technologies	15 000	20 000	–	15 750	16 601	17 349	18 390
Space Science	–	13 074	205	6 033	5 000	5 786	7 033
Square Kilometer Array	–	8 000	19 435	9 375	–	–	–
South African National Energy Research Institute	–	–	–	–	44 268	46 260	49 036
Gifts and donations	–	75	–	–	–	–	–

Table 31.4 Research, Development and Innovation (continued)

R thousand	Audited outcome			Adjusted appropriation	Medium-term expenditure estimate		
	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11
<b>Universities and technikons</b>							
<b>Current</b>	–	20 929	18 038	10 000	10 000	20 000	21 200
Biotechnology Strategy	–	200	–	–	–	–	–
Institutional and Programme Support	–	529	885	–	–	–	–
International Centre for Genetic Engineering and Biotechnology	–	–	–	10 000	10 000	20 000	21 200
Space Science	–	20 200	5 819	–	–	–	–
Hydrogen Strategy	–	–	6 000	–	–	–	–
Health Innovation	–	–	5 334	–	–	–	–
<b>Capital</b>	–	–	9 286	–	–	–	–
Space Science	–	–	9 286	–	–	–	–
<b>Public corporations and private enterprises</b>							
<b>Public corporations</b>							
<b>Other transfers</b>							
<b>Current</b>	122 875	125	21 540	–	5 000	5 786	7 033
Biotechnology Strategy	122 875	–	–	–	–	–	–
Institutional and Programme Support	–	114	–	–	–	–	–
Gifts and donations	–	11	–	–	–	–	–
Space Science	–	–	14 350	–	–	–	–
Innovation Projects	–	–	3 190	–	–	–	–
Hydrogen Strategy	–	–	4 000	–	5 000	5 786	7 033
<b>Capital</b>	–	–	8 714	–	–	–	–
Space Science	–	–	8 714	–	–	–	–
<b>Nonprofit institutions</b>							
<b>Current</b>	149 610	258 041	171 191	228 823	295 134	311 150	307 682
Biotechnology Strategy	143 711	154 650	148 080	161 763	175 507	175 629	186 167
Health Innovation	–	–	4 000	9 000	20 000	40 000	42 400
Hydrogen Strategy	–	–	–	17 147	39 071	45 382	21 605
Innovation Fund	–	101 597	–	–	–	–	–
Innovation Projects	–	–	–	4 601	4 510	5 159	5 459
Institutional and Programme Support	5 899	1 794	937	–	–	–	–
Space Science	–	–	3 174	11 558	25 100	26 208	32 480
Square Kilometer Array	–	–	–	24 121	25 496	13 322	14 121
Women in Science (NACI)	–	–	–	633	–	–	–
Biofuels	–	–	–	–	5 000	5 000	5 000
HIV/AIDS Prevention and Treatment Technologies	–	–	15 000	–	–	–	–
Women in Science	–	–	–	–	450	450	450
<b>Capital</b>	–	–	2 000	100 625	320 500	549 425	593 191
Hydrogen Strategy	–	–	–	10 000	40 500	42 525	45 077
Space Science	–	–	2 000	20 000	15 000	35 000	47 900
Square Kilometer Array	–	–	–	70 625	265 000	471 900	500 214

### Expenditure trends

Expenditure is dominated by current and capital transfers and subsidies to departmental agencies and non-profit institutions, which increase at an average annual rate of 17.5 per cent, from R333.5 million in 2004/05 to R541.3 million in 2007/08. This was due to a seven-fold increase in transfers to the *Space Science* subprogramme, from R41.6 million in 2004/05 to R293.5 in 2007/08, including a R70.6 million transfer in 2007/08 for the SKA and the development of the South African Environmental Observation Network and other satellite programmes. In addition, the Innovation Fund allocation increases by an average annual rate of 70.9 per cent, from R28.4 million in 2004/05 to R141.8 million in 2010/11.

Over the medium term, the programme's budget grows at an average annual rate of 31.4 per cent to R1.2 billion in 2010/11. Higher expenditure over the medium term is attributable to increased spending associated with implementing the 10-year innovation plan, which includes more investment in science and technology

infrastructure. This is evident in the significant transfers for capital investment in the SKA, which increase at an average annual rate of 92 per cent over the MTEF period to R500 million in 2010/11, and expanding support to the *Hydrogen and Energy* subprogramme through allocations to the hydrogen strategy and the establishment and funding of the South African National Energy Research Institute (SANERI).

### Programme 3: International Co-operation and Resources

**Purpose:** Develop and monitor bilateral and multilateral relationships and agreements in science and technology to strengthen the national system of innovation and enable a flow of knowledge, capacity and resources into South Africa and Africa.

- *Multilaterals and Africa* co-ordinates the department's participation in science and technology related multilateral organisations that have benefits for South Africa. Financial support is provided to the Africa Institute of South Africa and various institutions, in support of international science programmes.
- *International Resources* provides the department with the structures for leveraging substantial funding from the European Union Sixth Framework Programme through the European South African Science and Technology Advancement Programme (ESASTAP).
- *Bilateral Co-operation* ensures co-operation with countries outside Africa, promoting the development of a viable information society and knowledge economy. These co-operative relationships are an important resource in developing human capacity in science, engineering and innovation.

### Expenditure estimates

Table 31.5 International Co-operation and Resources

Subprogramme	Audited outcome			Adjusted	Medium-term expenditure estimate		
	2004/05	2005/06	2006/07	appropriation	2008/09	2009/10	2010/11
R thousand							
Multilaterals and Africa	28 954	57 529	68 857	50 174	50 163	53 319	55 535
International Resources	8 715	9 517	27 285	32 101	50 029	48 758	52 022
Bilateral Co-operation	8 501	10 589	28 162	21 501	29 123	30 262	31 797
<b>Total</b>	<b>46 170</b>	<b>77 635</b>	<b>124 304</b>	<b>103 776</b>	<b>129 315</b>	<b>132 339</b>	<b>139 354</b>
Change to 2007 Budget estimate				(14 240)	(15 638)	(25 362)	(27 809)
<b>Economic classification</b>							
<b>Current payments</b>	<b>24 320</b>	<b>31 777</b>	<b>42 005</b>	<b>44 606</b>	<b>47 007</b>	<b>48 888</b>	<b>51 296</b>
Compensation of employees	10 361	13 411	17 401	19 616	21 912	22 713	23 467
Goods and services	13 959	18 366	24 604	24 990	25 095	26 175	27 829
of which:							
Communication	924	843	1 677	4 341	4 575	4 786	5 001
Computer services	584	443	652	1 663	1 753	1 833	1 916
Consultants, contractors and special services	2 773	2 886	8 030	3 209	3 382	3 538	3 697
Inventory	1 776	541	1 981	882	930	972	1 016
Maintenance, repairs and running costs	126	4	141	25	26	28	29
Operating leases	143	213	159	366	386	404	422
Travel and subsistence	3 565	9 797	9 668	9 684	10 207	10 676	11 157
<b>Transfers and subsidies</b>	<b>21 326</b>	<b>45 395</b>	<b>81 791</b>	<b>59 004</b>	<b>82 154</b>	<b>83 288</b>	<b>87 885</b>
Provinces and municipalities	25	37	11	–	–	–	–
Departmental agencies and accounts	16 325	25 324	29 564	26 816	28 941	28 408	30 311
Universities and technikons	–	1 855	3 188	3 201	–	–	–
Public corporations and private enterprises	–	10 173	28 692	14 750	–	–	–
Foreign governments and international organisations	11	–	–	–	–	–	–
Non-profit institutions	4 965	7 997	20 172	14 226	53 213	54 880	57 574
Households	–	9	164	11	–	–	–
<b>Payments for capital assets</b>	<b>524</b>	<b>463</b>	<b>508</b>	<b>166</b>	<b>154</b>	<b>163</b>	<b>173</b>
Machinery and equipment	524	463	508	166	154	163	173
<b>Total</b>	<b>46 170</b>	<b>77 635</b>	<b>124 304</b>	<b>103 776</b>	<b>129 315</b>	<b>132 339</b>	<b>139 354</b>

Table 31.5 International Co-operation and Resources (continued)

R thousand	Audited outcome			Adjusted appropriation	Medium-term expenditure estimate		
	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11
<b>Details of major transfers and subsidies</b>							
<b>Departmental agencies and accounts</b>							
<b>Departmental agencies (non-business entities)</b>							
<b>Current</b>	<b>16 325</b>	<b>25 324</b>	<b>29 564</b>	<b>26 816</b>	<b>28 941</b>	<b>28 408</b>	<b>30 311</b>
Africa Institute of South Africa	16 325	18 968	24 954	26 530	28 941	28 408	30 311
Global Science - Multilaterals and Africa	–	6 200	4 610	286	–	–	–
Gifts and donations	–	156	–	–	–	–	–
<b>Universities and technikons</b>							
<b>Current</b>	<b>–</b>	<b>1 855</b>	<b>3 188</b>	<b>3 201</b>	<b>–</b>	<b>–</b>	<b>–</b>
Global Science - Multilaterals and Africa	–	1 855	3 188	3 201	–	–	–
<b>Public corporations and private enterprises</b>							
<b>Public corporations</b>							
<b>Other transfers</b>							
<b>Current</b>	<b>–</b>	<b>10 173</b>	<b>28 692</b>	<b>14 750</b>	<b>–</b>	<b>–</b>	<b>–</b>
Global Science - Multilaterals and Africa	–	10 173	28 692	14 750	–	–	–
<b>Foreign governments and international organisations</b>							
<b>Current</b>	<b>11</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>
Global Science - Multilaterals and Africa	11	–	–	–	–	–	–
<b>Nonprofit institutions</b>							
<b>Current</b>	<b>4 965</b>	<b>7 997</b>	<b>20 172</b>	<b>14 226</b>	<b>53 213</b>	<b>54 880</b>	<b>57 574</b>
Global Science - Multilaterals and Africa	4 965	7 997	20 172	14 226	13 203	13 616	14 285
Global Science - Bilateral Cooperation	–	–	–	–	11 688	12 055	12 646
Global Science - International Resources	–	–	–	–	28 322	29 209	30 643

## Expenditure trends

Between 2004/05 and 2007/08, expenditure increased from R46.2 million to R103.8 million, at an average annual rate of 31 per cent. Over the medium term, growth in expenditure slows to an average annual 10.3 per cent, reaching R139.4 million in 2010/11. Expenditure in the programme increases over the full period under review as the department aims to benefit from cross-border flows of knowledge, innovation, capacity and resources through increased international co-operation. The increase in the *Multilaterals and Africa* subprogramme is attributable to the department's expanded involvement in the New Economic Partnership for Africa's Development's (NEPAD) African science and technology programme.

## Programme 4: Human Capital and Knowledge Systems

**Purpose:** Develop and implement national programmes to produce knowledge and develop human capital and the associated infrastructure, equipment and public research services.

- *Human Capital and Science Platforms* conceptualises, formulates and implements programmes that address the availability of human capital for science, technology and innovation. It ensures the production of new knowledge to build South Africa's knowledge resources. Funding is provided to institutions such as the National Research Foundation, and programmes such as human resource development and research chairs.
- *Indigenous Knowledge Systems* focuses on the development of indigenous knowledge and its integration into the national system of innovation by developing and integrating policy and undertaking strategic projects through the national indigenous knowledge systems office.
- *Emerging Research Areas and Infrastructure* steers the advancement of novel and cross-cutting research areas and the establishment of world class research infrastructure in the national system of innovation. Funding is provided to institutions and programmes such as SANReN and the frontier science and technology programme.

## Expenditure estimates

Table 31.6 Human Capital and Knowledge Systems

Subprogramme	Audited outcome			Adjusted appropriation	Medium-term expenditure estimate		
	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11
R thousand							
Human Capital and Science Platforms	507 872	631 443	751 937	928 613	1 053 198	1 141 435	1 267 975
Indigenous Knowledge Systems	11 417	5 277	8 382	10 445	11 512	23 274	24 580
Emerging Research Areas and Infrastructure	1 829	2 301	115 802	313 021	384 314	449 713	476 600
<b>Total</b>	<b>521 118</b>	<b>639 021</b>	<b>876 121</b>	<b>1 252 079</b>	<b>1 449 024</b>	<b>1 614 422</b>	<b>1 769 155</b>
Change to 2007 Budget estimate				(5 250)	26 616	43 189	103 648
<b>Economic classification</b>							
<b>Current payments</b>	<b>17 351</b>	<b>16 486</b>	<b>17 934</b>	<b>20 154</b>	<b>22 945</b>	<b>24 018</b>	<b>25 044</b>
Compensation of employees	9 755	9 682	10 206	12 665	15 951	16 547	17 105
Goods and services	7 595	6 804	7 728	7 489	6 994	7 471	7 939
<i>of which:</i>							
Communication	518	647	432	421	391	414	439
Computer services	137	171	171	460	155	165	175
Consultants, contractors and special services	669	1 834	435	715	394	417	442
Inventory	1 005	256	362	334	328	347	368
Maintenance, repairs and running costs	2	3	2	42	2	2	2
Operating leases	18	22	56	49	51	55	58
Travel and subsistence	1 778	2 913	5 563	3 585	5 035	5 337	5 657
Financial transactions in assets and liabilities	1	–	–	–	–	–	–
<b>Transfers and subsidies</b>	<b>503 480</b>	<b>622 522</b>	<b>857 900</b>	<b>1 231 715</b>	<b>1 425 925</b>	<b>1 590 241</b>	<b>1 743 938</b>
Provinces and municipalities	11	30	3	–	–	–	–
Departmental agencies and accounts	454 288	564 047	774 932	1 075 416	1 180 515	1 294 487	1 435 660
Universities and technikons	–	4 761	6 529	18	–	–	–
Public corporations and private enterprises	–	22 748	47 146	20 445	–	–	–
Non-profit institutions	49 181	30 643	29 287	135 335	245 410	295 754	308 278
Households	–	293	3	501	–	–	–
<b>Payments for capital assets</b>	<b>287</b>	<b>13</b>	<b>287</b>	<b>210</b>	<b>154</b>	<b>163</b>	<b>173</b>
Machinery and equipment	287	13	287	210	154	163	173
<b>Total</b>	<b>521 118</b>	<b>639 021</b>	<b>876 121</b>	<b>1 252 079</b>	<b>1 449 024</b>	<b>1 614 422</b>	<b>1 769 155</b>
<b>Details of major transfers and subsidies</b>							
<b>Departmental agencies and accounts</b>							
<b>Departmental agencies (non-business entities)</b>							
<b>Current</b>	<b>450 288</b>	<b>548 807</b>	<b>704 932</b>	<b>1 025 416</b>	<b>1 039 409</b>	<b>1 097 828</b>	<b>1 227 201</b>
Frontier Science and Technology	–	8 896	15 000	–	–	–	–
Human Resource Development	–	12 600	55 000	183 500	256 810	302 714	384 178
Learnerships	4 000	–	–	3 855	6 640	7 023	7 444
National Research Foundation	446 288	512 641	596 671	650 299	686 959	693 958	735 798
Science Themes	–	14 639	33 261	29 012	–	–	–
South African National Research Network	–	–	–	158 750	89 000	94 133	99 781
Gifts and donations	–	31	–	–	–	–	–
Science and Youth	–	–	2 500	–	–	–	–
Indigenous Knowledge System	–	–	2 500	–	–	–	–
<b>Capital</b>	<b>4 000</b>	<b>15 240</b>	<b>50 000</b>	<b>50 000</b>	<b>141 106</b>	<b>196 659</b>	<b>208 459</b>
Equipment Placement	–	11 000	–	–	–	–	–
National Research Foundation	4 000	4 240	–	–	–	–	–
Research and Development Infrastructure	–	–	50 000	50 000	141 106	196 659	208 459
<b>Universities and technikons</b>							
<b>Current</b>	<b>–</b>	<b>4 761</b>	<b>6 529</b>	<b>18</b>	<b>–</b>	<b>–</b>	<b>–</b>
Frontier Science and Technology	–	3 400	682	–	–	–	–
Science and Youth	–	681	1 297	–	–	–	–
Science Themes	–	680	3 350	18	–	–	–
Human Resource Development	–	–	1 000	–	–	–	–
Indigenous Knowledge System	–	–	200	–	–	–	–

Table 31.6 Human Capital and Knowledge Systems (continued)

R thousand	Audited outcome			Adjusted appropriation	Medium-term expenditure estimate		
	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11
<b>Public corporations and private enterprises</b>							
<b>Public corporations</b>							
<b>Other transfers</b>							
<b>Current</b>	–	22 748	27 146	20 445	–	–	–
Frontier Science and Technology	–	12 362	402	18 000	–	–	–
Learnerships	–	3 134	4 444	2 445	–	–	–
Science Themes	–	7 252	300	–	–	–	–
South African National Research Network	–	–	22 000	–	–	–	–
<b>Nonprofit institutions</b>							
<b>Current</b>	49 181	30 643	29 287	53 335	100 910	141 745	145 028
Academies	2 500	2 500	3 000	4 274	5 320	7 393	7 924
Frontier Science and Technology	–	3 734	5 300	–	–	–	–
Indigenous Knowledge System	10 000	3 500	790	5 000	5 270	16 676	17 667
Learnerships	–	1 866	–	–	–	–	–
Science and Youth	11 000	15 900	16 438	28 100	43 188	54 525	57 797
Science Themes	25 681	3 143	3 759	15 961	47 132	63 151	61 640
<b>Capital</b>	–	–	–	82 000	144 500	154 009	163 250
Frontier Science and Technology	–	–	–	82 000	144 500	154 009	163 250

## Expenditure trends

Expenditure increased at an average annual rate of 33.9 per cent, from R521.1 million in 2004/05 to R1.3 billion in 2007/08. Over the medium term, the budget grows at an average annual rate of 12.2 per cent to R1.8 billion in 2010/11. Throughout the period under review, expenditure growth is evident in the *Human Capital and Science Platforms* subprogramme, which increases at an average annual rate of 10.9 per cent over the MTEF period. This is due to more support for science, engineering and technology human capital initiatives, mainly through increasing allocations to the National Research Foundation and more funding for human resource development. Growth is also evident in the *Emerging Research Areas and Infrastructure* subprogramme, with spending rising at an average annual rate of 15 per cent over the MTEF period. Allocations are for establishing and funding SANReN and capital expenditure for research and development infrastructure. Capital expenditure on frontier science and technology grows by an average annual 25.8 per cent between 2007/08 and 2010/11.

Within the transfers to the NRF, additional allocations were made in the 2008 Budget for the expansion of the South African research chairs initiative, as well as the honours, masters and doctorate programmes. The allocations are R26 million in 2008/09, R43 million in 2009/10 and R104 million in 2010/11.

## Programme 5: Socio-Economic Partnerships

**Purpose:** Serve as a strategic partner in government and with industry, contributing to South Africa's transition to a knowledge economy.

- *Science and Technology for Economic Impact* manages a portfolio of directed science, engineering and technology programmes which demonstrate their potential for positive economic results.
- *Science and Technology for Social Impact* is responsible for directed, large scale scientific research programmes set up to address the challenges of human and social dynamics in development, and for directed technology programmes which contribute to learning and decision making for sustainable livelihoods and sustainable human settlements.
- *Science and Technology Investment* manages a portfolio of directed monitoring, assessment and reporting activities on science, technology and innovation investments and performance.

## Expenditure Estimates

Table 31.7 Socio-Economic Partnerships

Subprogramme	Audited outcome			Adjusted appropriation	Medium-term expenditure estimate		
	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11
R thousand							
Science and Technology for Economic Impact	510 016	714 965	769 045	852 552	1 013 581	1 048 719	1 117 480
Science and Technology for Social Impact	157 381	166 106	216 047	256 593	109 768	115 742	139 916
Science and Technology Investment	2 135	2 686	5 471	22 866	23 682	23 637	22 833
<b>Total</b>	<b>669 532</b>	<b>883 757</b>	<b>990 563</b>	<b>1 132 011</b>	<b>1 147 031</b>	<b>1 188 098</b>	<b>1 280 229</b>
Change to 2007 Budget estimate				(3 250)	(46 280)	(47 724)	(29 742)

## Economic classification

	12 747	10 890	21 236	44 365	27 682	30 858	32 414
<b>Current payments</b>							
Compensation of employees	5 948	5 553	12 866	18 599	20 105	20 873	21 575
Goods and services	6 799	5 337	8 370	25 766	7 577	9 985	10 839
<i>of which:</i>							
Communication	284	354	741	569	671	711	743
Computer services	273	341	232	600	210	223	233
Consultants, contractors and special services	1 159	2 321	2 788	20 250	2 523	2 639	2 797
Inventory	700	192	455	337	412	436	456
Maintenance, repairs and running costs	4	5	14	12	13	13	14
Operating leases	59	74	175	150	158	167	175
Travel and subsistence	757	1 320	3 585	3 079	3 245	3 716	3 883
<b>Transfers and subsidies</b>	<b>656 623</b>	<b>872 772</b>	<b>969 040</b>	<b>1 087 261</b>	<b>1 119 195</b>	<b>1 157 077</b>	<b>1 247 642</b>
Provinces and municipalities	13	16	5	–	–	–	–
Departmental agencies and accounts	216 736	177 242	204 663	364 146	503 357	516 155	568 062
Universities and technikons	16 289	4 729	8 931	–	–	–	–
Public corporations and private enterprises	348 326	563 927	634 627	554 544	545 861	572 774	607 343
Non-profit institutions	66 331	126 855	120 780	168 460	69 977	68 148	72 237
Households	8 928	3	34	111	–	–	–
<b>Payments for capital assets</b>	<b>162</b>	<b>95</b>	<b>287</b>	<b>385</b>	<b>154</b>	<b>163</b>	<b>173</b>
Machinery and equipment	162	95	287	385	154	163	173
<b>Total</b>	<b>669 532</b>	<b>883 757</b>	<b>990 563</b>	<b>1 132 011</b>	<b>1 147 031</b>	<b>1 188 098</b>	<b>1 280 229</b>

## Details of major transfers and subsidies

Provinces and municipalities							
Municipalities							
Municipal bank accounts							
Current	13	16	5	–	–	–	–
Regional Services Council levies	13	16	5	–	–	–	–
Departmental agencies and accounts							
Departmental agencies (non-business entities)							
Current	216 736	177 242	204 663	364 146	503 357	516 155	568 062
Advanced Manufacturing Technology Strategy	21 000	–	–	42 808	48 000	50 000	52 000
South African National Energy Research Institute	10 000	–	–	42 000	–	–	–
Centres of Excellence	1 500	20 000	–	–	–	–	–
Council for Scientific and Industrial Research: National Laser Centre	18 000	–	–	–	–	–	–
Human Sciences Research Council	83 336	104 293	121 473	155 949	157 818	151 145	160 416
Leveraging Services Strategy	–	–	1 739	–	–	–	–
National Public Assets	35 000	43 000	43 000	43 000	–	–	–
Resource Based Industries	–	650	–	–	33 201	35 116	37 223
Technology for Poverty Alleviation	–	1 479	6 151	4 500	23 660	25 768	28 424
Technology for Sustainable Livelihoods	–	1 350	–	–	32 155	33 088	32 783
Technology Planning and Diffusion	47 900	6 470	19 300	39 889	–	–	–
Tshumisano trust	–	–	–	36 000	36 600	36 694	39 000
South African Research Chairs Initiative for Human Sciences	–	–	–	–	18 500	18 500	18 500



Table 31.7 Socio-Economic Partnerships (continued)

R thousand	Audited outcome			Adjusted appropriation	Medium-term expenditure estimate		
	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11
Information Communication Technology	–	–	13 000	–	–	–	–
Local Systems of Innovation	–	–	–	–	6 912	7 758	8 604
Local Manufacturing Capacity	–	–	–	–	28 179	26 900	28 550
Global Change Science and Technology	–	–	–	–	17 000	25 000	32 000
Natural Resources and Public Assets	–	–	–	–	52 832	55 686	59 062
Human and Social Development Dynamics	–	–	–	–	26 500	28 500	49 500
Science and Technology Indicators	–	–	–	–	3 000	7 000	10 000
Research Information Management System	–	–	–	–	14 000	10 000	6 000
Quality of Life Nuclear Technologies	–	–	–	–	5 000	5 000	6 000
<b>Universities and technikons</b>							
<b>Current</b>	<b>16 289</b>	<b>4 729</b>	<b>8 931</b>	–	–	–	–
Information Communication Technology	–	282	–	–	–	–	–
South African National Energy Research Institute	–	500	–	–	–	–	–
Technology for Poverty Alleviation	–	1 500	–	–	–	–	–
Technology for Sustainable Livelihoods	16 289	2 447	8 298	–	–	–	–
Leveraging Services Strategy	–	–	633	–	–	–	–
<b>Public corporations and private enterprises</b>							
<b>Public corporations</b>							
<b>Other transfers</b>							
<b>Current</b>	<b>348 326</b>	<b>563 927</b>	<b>634 627</b>	<b>554 544</b>	<b>545 861</b>	<b>572 774</b>	<b>607 343</b>
Advanced Manufacturing Technology Strategy	–	41 515	41 800	19 592	–	–	–
Council for Scientific and Industrial Research	348 326	431 649	483 194	517 352	545 861	572 774	607 343
Information Communication Technology	–	13 741	14 200	–	–	–	–
Resource Based Industries	–	15 050	24 208	17 600	–	–	–
Technology for Poverty Alleviation	–	7 921	20 098	–	–	–	–
Technology for Sustainable Livelihoods	–	31 051	44 702	–	–	–	–
Technology Planning and Diffusion	–	5 000	6 425	–	–	–	–
Council for Scientific and Industrial Research: National Laser Centre	–	18 000	–	–	–	–	–
<b>Nonprofit institutions</b>							
<b>Current</b>	<b>66 331</b>	<b>126 855</b>	<b>120 780</b>	<b>168 460</b>	<b>69 977</b>	<b>68 148</b>	<b>72 237</b>
Information Communication Technology	9 000	–	–	54 210	69 977	68 148	72 237
Nuclear Energy Corporation of South Africa: Fluoro Chemicals	–	20 000	–	–	–	–	–
Resource Based Industries	10 000	4 380	5 458	13 900	–	–	–
South African National Energy Research Institute	–	19 500	40 000	–	–	–	–
Technology for Poverty Alleviation	6 561	–	–	–	–	–	–
Technology for Poverty Alleviation	24 200	2 000	8 986	35 500	–	–	–
Technology for Sustainable Livelihoods	16 570	12 151	–	53 100	–	–	–
Technology Planning and Diffusion	–	68 824	55 708	6 750	–	–	–
Advanced Manufacturing Technology Strategy	–	–	10 000	–	–	–	–
Leveraging Services Strategy	–	–	628	–	–	–	–
Biofuels	–	–	–	5 000	–	–	–

## Expenditure trends

Expenditure increased from R669.5 million in 2004/05 to R1.1 billion in 2007/08, at an average annual rate of 19.1 per cent, primarily in the *Science and Technology for Economic Impact* subprogramme, which accounts for 18.7 per cent of programme expenditure between 2004/05 and 2007/08. Transfer allocations increased for a wide variety of institutions, including the CSIR, which accounts for an average of 48.4 per cent of all programme spending between 2004/05 and 2007/08, and the HSRC, which experienced a 23.2 per cent growth in expenditure from R83.3 million in 2004/05 to R156 million in 2007/08.

Expenditure growth moderates considerably over the MTEF period, rising at an average annual rate of 4.2 per cent to R1.3 billion in 2010/11. Over this period, in addition to continued large allocations to institutions such as the CSIR and HSRC, a number of new research programmes will be funded on a wide

variety of issues, including local manufacturing capacity (R29 million allocation in 2010/11), global change science and technology (R32 million in 2010/11), natural resources and public assets (R59 million in 2010/11), and human and social development dynamics (R50 million in 2010/11).

## Public entities and other agencies

### Human Sciences Research Council

The Human Sciences Research Council (HSRC) is a statutory research council mandated to undertake, promote and co-ordinate policy-relevant, problem-oriented research in the human and social sciences. The public purpose mandate of the HSRC is derived from the Human Sciences Research Act (1968). The act also mandates the HSRC to undertake contract research on any subject in the field of the human sciences and to charge fees for research conducted or services provided.

The HSRC aligns its research activities and structures to South Africa's national development priorities, notably: poverty reduction through economic development, skills enhancement, job creation, the elimination of discrimination and inequalities, and effective service delivery. The HSRC is poised to play a key role in the implementation of the Cabinet approved 10-year innovation plan (2008-2018), particularly in relation to the challenge of human and social dynamics.

The HSRC measures its performance in terms of indicators grouped under the acronym PAITECS: the public purpose mandate of the organisation; international collaboration, with particular emphasis on research in Africa; the implementation and impact of research; ongoing and deepened transformation of the organisational workforce; excellence and capacity building in research; and sustainability through securing external funding to supplement the Parliamentary grant in order to support long term, large scale research projects and programmes.

### Selected performance indicators

Indicators	Annual performance						
	Past			Current	Projected		
	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11
<b>Public purpose:</b>							
Number of African research fellows at the HSRC	–	–	4	12	10	12	15
<b>Capacity building:</b>							
Number of interns enrolled in a masters programme	25	17	29	38	35	36	36
Number of interns enrolled in a PhD programme	25	17	20	26	20	22	24
Number of postdoctoral fellowships	–	–	4	8	9	9	10

### Expenditure estimates

**Table 31.8 Human Sciences Research Council (HSRC)**

R thousand	Audited outcome			Estimated outcome	Medium-term estimate		
	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11
<b>Revenue</b>							
<b>Non-tax revenue</b>	<b>148 378</b>	<b>112 710</b>	<b>124 270</b>	<b>131 359</b>	<b>148 095</b>	<b>172 972</b>	<b>174 823</b>
Sale of goods and services other than capital assets	136 469	99 733	110 608	116 877	132 744	156 701	157 575
<i>of which:</i>							
<i>Research revenue</i>	136 469	99 733	110 608	116 877	132 744	156 701	157 575
Other non-tax revenue	11 909	12 977	13 662	14 482	15 351	16 272	17 248
<b>Transfers received</b>	<b>83 336</b>	<b>104 293</b>	<b>121 473</b>	<b>155 949</b>	<b>157 818</b>	<b>151 145</b>	<b>160 416</b>
<b>Total revenue</b>	<b>231 714</b>	<b>217 003</b>	<b>245 743</b>	<b>287 308</b>	<b>305 913</b>	<b>324 117</b>	<b>335 239</b>

Table 31.8 Human Sciences Research Council (HSRC) (continued)

R thousand	Audited outcome			Estimated outcome	Medium-term estimate		
	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11
<b>Expenses</b>							
<b>Current expense</b>	<b>226 369</b>	<b>214 207</b>	<b>240 482</b>	<b>287 308</b>	<b>305 913</b>	<b>324 117</b>	<b>335 239</b>
Compensation of employees	108 995	112 623	121 153	159 177	168 727	178 851	189 582
Goods and services	111 191	97 479	115 535	124 662	133 253	141 356	141 637
Depreciation	6 183	4 105	3 794	3 470	3 932	3 910	4 020
<b>Transfers and subsidies</b>	<b>551</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>Total expenses</b>	<b>226 920</b>	<b>214 207</b>	<b>240 482</b>	<b>287 308</b>	<b>305 913</b>	<b>324 117</b>	<b>335 239</b>
<b>Surplus / (Deficit)</b>	<b>4 794</b>	<b>2 796</b>	<b>5 261</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>Balance sheet data</b>							
Carrying value of assets	57 023	90 424	89 420	103 125	108 577	109 806	113 921
<i>of which: Acquisition of assets</i>	<i>4 642</i>	<i>4 743</i>	<i>2 832</i>	<i>17 175</i>	<i>9 383</i>	<i>5 139</i>	<i>8 134</i>
Inventory	1 474	2 023	3 268	3 464	3 672	3 892	4 126
Receivables and prepayments	33 731	21 466	34 393	36 457	38 644	40 963	43 420
Cash and cash equivalents	30 375	15 903	29 393	17 170	13 291	13 726	11 378
<b>Total assets</b>	<b>122 603</b>	<b>129 816</b>	<b>156 474</b>	<b>160 216</b>	<b>164 183</b>	<b>168 387</b>	<b>172 845</b>
Capital and reserves	59 526	89 606	94 105	94 105	94 105	94 104	94 104
Trade and other payables	55 605	32 124	52 621	55 778	59 125	62 672	66 433
Provisions	7 472	8 086	9 748	10 333	10 953	11 610	12 307
<b>Total equity and liabilities</b>	<b>122 603</b>	<b>129 816</b>	<b>156 474</b>	<b>160 216</b>	<b>164 183</b>	<b>168 386</b>	<b>172 843</b>

### Expenditure trends

The HSRC is funded by transfer payments (as a core grant) from the Department of Science and Technology, as well as ring-fenced allocations. Between 2004/05 and 2007/08, expenditure increased at an average annual rate of 8.2 per cent from R226.9 million to R287.3 million. The largest increase, of 19 per cent in 2007/08, was primarily due to significant increases in ring-fenced allocations for: the establishment of a policy analysis unit; the institutionalisation and expansion of research capacity development work, notably through a research internship scheme; and time-limited support for urgent capital requirements. Upward trends in the value of assets reflected in the balance sheet for 2008/09 are attributable to refurbishments that took place with the help of the capital grant funding received for 2007/08.

Allocations over the MTEF period are R156.7 million, R149.9 million and R158.8 million (including VAT). In addition to the MTEF allocation, the HSRC has received ring-fenced allocations of R32 million, R24.3 million and R25.8 million for the same period. The entity's budget is projected to grow from R287.3 million in 2007/08 to R335.2 million in 2010/11, at an average annual rate of 8 per cent.

### National Research Foundation

The National Research Foundation (NRF) was established by the National Research Foundation Act (1998). The objective of the foundation is to support and promote research through funding, human resource development and the provision of the necessary research facilities for the creation of knowledge, innovation and development in all fields of science and technology, including indigenous knowledge. In this way the NRF contributes to the improvement of the quality of life of all South Africans. The NRF performs an agency function on behalf of the Department of Science and Technology and currently acts as a service provider for the Department of Environmental Affairs and Tourism for marine research, the Department of Trade and Industry for the technology and human resources for industry programme, and the Department of Labour for the Scarce Skills Development Fund.

The activities of the NRF include participating in the research and innovation support and advancement cluster and managing national research facilities in areas such as astro/space/geosciences (for example the South African Astronomical Observatory), biodiversity/conservation (for example the South African Institute for Aquatic Biodiversity), and nuclear sciences (for example the iThemba laboratory). The research and innovation

support and advancement cluster includes programmes that the NRF manages as a service provider to other departments and the South African Agency for Science and Technology Advancement.

### Selected performance indicators

Indicators	Annual performance						
	Past			Current	Projected		
	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11
<b>Human resource development:</b>							
Number of students supported:							
- BSc	589	662	662	232	488	345	Block grants
- MSc	2 049	2 148	2 003	1 604	1 920	1 883	1 996
- PhD	1 100	1 197	1 179	1 080	1 258	1 300	1 378
Transformation in profile of researchers supported:							
- black	387	473	494	445	650	743	788
- female	508	600	670	634	873	977	1 036
Number of researchers supported	1 481	1 617	1 680	1 547	1 857	1 954	2 071
Number of MSc and PhD students supervised by NRF staff	-	146	167	163	214	246	261
<b>Facilities knowledge production:</b>							
Number of peer reviewed publications by researchers funded through the research and innovation support and advancement cluster	2 335	3 024	2 534	-	4 004	4 405	4 669
Number of refereed journal articles by NRF staff	-	119	164	90	178	202	214
Value of investment (grants) in focus area and development programme	R163.9m	R173.m	R195.8m	-	R203.4m	R203.9m	R216.1m

### Expenditure estimates

Table 31.9 National Research Foundation

R thousand	Audited outcome			Estimated outcome	Medium-term estimate		
	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11
<b>Revenue</b>							
<b>Non-tax revenue</b>	<b>464 081</b>	<b>447 342</b>	<b>608 837</b>	<b>919 582</b>	<b>981 914</b>	<b>1 088 349</b>	<b>1 196 986</b>
Sale of goods and services other than capital assets	6 857	7 659	9 474	8 809	9 000	9 500	10 000
<i>of which:</i>							
<i>Sales by market establishments</i>	6 857	7 659	9 474	8 809	9 000	9 500	10 000
Other non-tax revenue	457 224	439 683	599 363	910 773	972 914	1 078 849	1 186 986
<b>Transfers received</b>	<b>450 288</b>	<b>542 144</b>	<b>596 671</b>	<b>620 467</b>	<b>686 959</b>	<b>693 958</b>	<b>735 798</b>
<b>Total revenue</b>	<b>914 369</b>	<b>989 486</b>	<b>1 205 508</b>	<b>1 540 049</b>	<b>1 668 873</b>	<b>1 782 307</b>	<b>1 932 784</b>
<b>Expenses</b>							
<b>Current expense</b>	<b>322 337</b>	<b>393 839</b>	<b>448 225</b>	<b>528 248</b>	<b>547 550</b>	<b>585 876</b>	<b>628 531</b>
Compensation of employees	168 080	203 582	229 986	260 561	282 709	302 492	323 728
Goods and services	135 375	178 993	202 502	246 173	242 541	259 234	278 903
Depreciation	18 642	11 103	15 074	21 514	22 300	24 150	25 900
Interest, dividends and rent on land	240	161	663	-	-	-	-
<b>Transfers and subsidies</b>	<b>596 658</b>	<b>636 857</b>	<b>747 369</b>	<b>1 042 848</b>	<b>1 121 323</b>	<b>1 196 431</b>	<b>1 304 253</b>
<b>Total expenses</b>	<b>918 995</b>	<b>1 030 696</b>	<b>1 195 594</b>	<b>1 571 096</b>	<b>1 668 873</b>	<b>1 782 307</b>	<b>1 932 784</b>
<b>Surplus / (Deficit)</b>	<b>(4 626)</b>	<b>(41 210)</b>	<b>9 914</b>	<b>(31 047)</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>Balance sheet data</b>							
Carrying value of assets	131 856	163 078	210 559	240 026	275 626	312 326	351 276
<i>of which: Acquisition of assets</i>	20 661	43 351	62 754	51 346	58 000	61 000	65 000
Investments	76 558	85 800	97 949	100 981	120 000	150 000	200 000
Inventory	2 801	2 863	2 696	3 500	3 500	3 500	3 500
Loans	-	3 051	3 462	-	-	-	-
Receivables and prepayments	743 706	745 719	802 070	767 301	750 000	700 000	500 000
Cash and cash equivalents	426 407	311 506	482 351	384 427	300 000	300 000	250 000
<b>Total assets</b>	<b>1 381 328</b>	<b>1 312 017</b>	<b>1 599 087</b>	<b>1 496 235</b>	<b>1 449 126</b>	<b>1 465 826</b>	<b>1 304 776</b>

**Table 31.9 National Research Foundation (continued)**

R thousand	Audited outcome			Estimated outcome	Medium-term estimate		
	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11
Capital and reserves	192 035	161 022	217 316	216 101	251 801	288 651	327 751
Borrowings	135	9 787	(491)	3 000	3 000	3 000	3 000
Post retirement benefits	–	–	–	90 000	92 000	95 000	100 000
Trade and other payables	1 022 072	1 037 419	1 273 387	1 135 135	1 071 575	1 054 676	851 776
Provisions	109 159	103 789	108 875	18 000	18 750	19 500	20 250
Managed funds	57 927	–	–	34 000	12 000	5 000	2 000
<b>Total equity and liabilities</b>	<b>1 381 328</b>	<b>1 312 017</b>	<b>1 599 087</b>	<b>1 496 235</b>	<b>1 449 126</b>	<b>1 465 826</b>	<b>1 304 776</b>

### Expenditure trends

The NRF is funded by transfer payments (as a core grant) from the Department of Science and Technology, as well as ring-fenced allocations and contracts. Allocations for the MTEF period (before deferred income) are R591.6 million, R611 million and R647.7 million. There are additional ring-fenced allocations of R128.3 million, R116.2 million and R124.1 million over the MTEF period. The entity's budget is set to grow at an average annual 7.6 per cent from R1.7 billion in 2008/09 to R1.9 billion in 2010/11. The most significant growth is in 2010/11, at 8.4 per cent, largely reflecting spending on the SKA.

### Council for Scientific and Industrial Research

The Council for Scientific and Industrial Research (CSIR) is governed by the Scientific Research Council Act (1988). The objectives of the CSIR are to foster industrial and scientific development in the national interest, through directed and particularly multidisciplinary research and technological innovation, either by itself or in co-operation with principals from the private or public sectors.

The CSIR performs its work through groups focusing on biosciences, the built environment, defence, peace, safety and security, ICT, laser technology, materials science and manufacturing, natural resources and the environment, space technology, and metrology.

The CSIR operates with two kinds of research and development income. The government transfer is used for strengthening the CSIR's science and technology base, knowledge, people and infrastructure. Income derived from contract research for clients in the public and private sectors, locally and abroad, is used for specific projects. This component of revenue amounted to about R660 million in 2006/07.

### Selected performance indicators

Indicators	Annual performance						
	Past			Current	Projected		
	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11
Number of new technology packages available for transfer	–	–	–	23	28	35	36
Publication equivalents	–	–	–	259	307	365	400
New invention disclosures	–	–	–	27	34	44	46
Number of substantial collaborative research activities	–	–	–	55	60	65	70
Number of science engineering and technology staff with PhD level qualifications	–	–	–	242	264	288	290
Number of postdoctoral grants awarded	–	–	–	26	36	49	50

## Expenditure estimates

Table 31.10 Council for Scientific and Industrial Research (CSIR)

R thousand	Audited outcome			Estimated outcome	Medium-term estimate		
	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11
<b>Revenue</b>							
<b>Non-tax revenue</b>	<b>696 491</b>	<b>709 118</b>	<b>728 925</b>	<b>750 167</b>	<b>808 877</b>	<b>913 886</b>	<b>1 001 171</b>
Sale of goods and services other than capital assets	617 917	581 602	660 587	693 564	753 904	858 697	940 273
of which:							
Research revenue	617 917	581 602	660 587	693 564	753 904	858 697	940 273
Other non-tax revenue	78 574	127 516	68 338	56 603	54 973	55 189	60 898
<b>Transfers received</b>	<b>385 852</b>	<b>421 631</b>	<b>460 443</b>	<b>614 532</b>	<b>670 640</b>	<b>687 789</b>	<b>732 496</b>
<b>Total revenue</b>	<b>1 082 343</b>	<b>1 130 749</b>	<b>1 189 368</b>	<b>1 364 699</b>	<b>1 479 518</b>	<b>1 601 675</b>	<b>1 733 667</b>
<b>Expenses</b>							
<b>Current expense</b>	<b>1 004 083</b>	<b>1 072 623</b>	<b>1 162 732</b>	<b>1 336 588</b>	<b>1 448 998</b>	<b>1 570 120</b>	<b>1 700 226</b>
Compensation of employees	567 621	634 196	594 974	684 220	742 379	805 481	873 947
Goods and services	386 698	380 790	510 700	586 140	623 653	663 567	706 035
Depreciation	42 272	40 239	50 682	58 333	74 565	92 134	110 734
Interest, dividends and rent on land	7 492	17 398	6 376	7 895	8 401	8 938	9 510
<b>Total expenses</b>	<b>1 004 086</b>	<b>1 072 630</b>	<b>1 162 835</b>	<b>1 336 588</b>	<b>1 448 998</b>	<b>1 570 120</b>	<b>1 700 226</b>
<b>Surplus / (Deficit)</b>	<b>78 257</b>	<b>58 119</b>	<b>26 533</b>	<b>28 111</b>	<b>30 520</b>	<b>31 555</b>	<b>33 441</b>
<b>Balance sheet data</b>							
Carrying value of assets	228 950	300 139	314 205	355 872	301 357	309 791	305 421
of which: Acquisition of assets	54 730	119 734	66 443	100 000	115 120	100 568	106 364
Investments	29 895	17 842	200 000	50 000	100 000	100 000	200 000
Inventory	65 504	46 866	43 203	45 363	49 310	56 164	61 499
Receivables and prepayments	143 157	159 980	146 906	154 387	167 583	190 059	207 756
Cash and cash equivalents	304 209	294 011	379 243	426 687	359 637	403 912	364 902
<b>Total assets</b>	<b>771 715</b>	<b>818 838</b>	<b>1 083 557</b>	<b>1 032 309</b>	<b>977 887</b>	<b>1 059 926</b>	<b>1 139 578</b>
Capital and reserves	262 388	319 929	347 716	375 827	406 347	437 901	471 342
Post retirement benefits	107 307	14 897	12 751	10 589	8 662	6 495	4 387
Trade and other payables	343 160	418 712	650 842	567 504	477 825	523 248	563 723
Provisions	58 860	65 300	72 248	78 389	85 052	92 282	100 126
<b>Total equity and liabilities</b>	<b>771 715</b>	<b>818 838</b>	<b>1 083 557</b>	<b>1 032 309</b>	<b>977 887</b>	<b>1 059 926</b>	<b>1 139 578</b>

## Expenditure trends

The CSIR is funded by transfers (as a core grant) from the Department of Science and Technology, as well as ring-fenced allocations for the laser loan programme, the Centre of Excellence on Climate Change, the centres of competence, light metals research, ICT/demonstration in government, and the Meraka Institute.

The CSIR generates about 60 per cent of its total revenue from research and development contract income. Baseline allocations (including VAT) for 2008/09, 2009/10 and 2010/11 are R559.3 million, R595.5 million and R639.1 million. The CSIR will receive additional ring-fenced allocations (including VAT) of R111.3 million, R92.3 million and R93.4 million for 2008/09, 2009/10 and 2010/11. Over the medium term, the CSIR's estimated revenue is set to grow at an average annual rate of 8.2 per cent, from R1.5 billion in 2008/09 to R1.7 billion in 2010/11.

## Africa Institute of South Africa

The Africa Institute of South Africa (AISA) is a statutory body established in terms of the Africa Institute of South Africa Act (2001). It focuses primarily on political, socioeconomic, international and development issues in contemporary Africa, and contributes to the goals of the national system of innovation through research programmes which impact on knowledge production, human resource development (especially developing capacity in African studies, a scarce resource in South Africa), social science, and innovation. AISA's key role

is to conduct research and support policy development, embark on training programmes, and establish, participate in and maintain networks for peace, development and prosperity in Africa. AISA's research also ensures the quality of policy decision making.

### Selected performance indicators

Indicators	Annual performance						
	Past			Current	Projected		
	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11
Number of books published	6	1	3	11	12	14	16
Number of collaborative books published	4	1	1	3	4	6	8
Number of journal articles published	2	4	4	3	4	4	4
Number of monographs published	5	2	2	8	72	80	100
Number of occasional papers published	-	4	2	5	36	40	50
Number of reference works published	1	1	3	3	4	5	5
Number of e-monographs	9	2	2	8	72	80	100
Number of newsletters published	5	5	3	4	5	8	12

### Expenditure trends

Allocations for the MTEF period are R27.8 million in 2008/09, R28.1 million in 2009/10 and R30.5 million in 2010/11. Included in all these is R1.5 million for the presidential projects. Over the medium term, the entity's budget is set to grow from R30.7 million in 2008/09 to R36.3 million in 2010/11, an average annual rate of 8.7 per cent, with the most significant growth in 2010/11 at 8.4 per cent. In 2007/08, rollovers of R12.5 million were approved by National Treasury and allocated for non-recurrent projects, including the development of policies and the acquisition of infrastructure assets such as new library shelves.

### Academy of Science of South Africa

The Academy of Science of South Africa (ASSAf) was initiated by scholars and scientists from all sectors of South African society, and launched as a voluntary association in 1996. In 2001, the academy was formally established and recognised by the state with the passing of the Academy of Science of South Africa Act (2001).

ASSAf's objectives are to: promote common ground for scientific thinking across all disciplines; encourage and promote innovative and independent scientific thinking; promote the optimum development of the intellectual capacity of all people; and link South Africa with scientific communities at the highest levels, in particular in Africa. The academy publishes scientific reports, investigates matters of public interest concerning science, and manages the South African Journal of Science.

The ASSAf consensus panel report on HIV and Aids, TB and nutrition was launched in November 2007 after international peer review and approval by the academy's council. It elicited extensive comment from the South African and international media, and the recommendations are being considered by the Department of Health, the Medical Research Council and others.

### Selected performance Indicators

Indicators	Annual performance						
	Past			Current	Projected		
	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11
Issues of South African Journal of Science	6	6	6	6	6	6	6
Number of awards: Medals, prizes and fellowships	2	3	3	—	4	4	5

Table 31.11 Academy of Science of South Africa

R thousand	Audited outcome			Estimated outcome	Medium-term estimate		
	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11
<b>Revenue</b>							
<b>Non-tax revenue</b>	<b>402</b>	<b>544</b>	<b>1 002</b>	<b>1 175</b>	<b>1 218</b>	<b>1 282</b>	<b>1 345</b>
Sale of goods and services other than capital assets <i>of which:</i>	246	305	730	775	808	862	915
<i>Sales by market establishments</i>	246	305	730	775	808	862	915
Other non-tax revenue	156	239	272	400	410	420	430
<b>Transfers received</b>	<b>2 547</b>	<b>4 048</b>	<b>4 960</b>	<b>5 643</b>	<b>5 454</b>	<b>5 637</b>	<b>5 847</b>
<b>Total revenue</b>	<b>2 949</b>	<b>4 592</b>	<b>5 962</b>	<b>6 818</b>	<b>6 672</b>	<b>6 919</b>	<b>7 192</b>
<b>Expenses</b>							
<b>Current expense</b>	<b>2 509</b>	<b>4 743</b>	<b>5 957</b>	<b>6 818</b>	<b>6 672</b>	<b>6 919</b>	<b>7 192</b>
Compensation of employees	1 370	1 702	2 065	2 560	2 816	3 098	3 407
Goods and services	1 121	3 016	3 869	4 235	3 828	3 791	3 753
Depreciation	14	25	23	23	28	30	32
Interest, dividends and rent on land	4	–	–	–	–	–	–
<b>Total expenses</b>	<b>2 509</b>	<b>4 743</b>	<b>5 957</b>	<b>6 818</b>	<b>6 672</b>	<b>6 919</b>	<b>7 192</b>
<b>Surplus / (Deficit)</b>	<b>440</b>	<b>(151)</b>	<b>5</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>
<b>Balance sheet data</b>							
Carrying value of assets	82	173	169	176	188	200	212
<i>of which: Acquisition of assets</i>	43	117	84	30	40	42	44
Cash and cash equivalents	4 390	5 104	4 337	3 748	4 042	3 721	4 073
<b>Total assets</b>	<b>4 472</b>	<b>5 277</b>	<b>4 506</b>	<b>3 924</b>	<b>4 230</b>	<b>3 921</b>	<b>4 285</b>
Capital and reserves	3 846	3 695	3 700	3 700	3 724	3 724	3 748
Trade and other payables	626	1 582	806	224	506	197	537
<b>Total equity and liabilities</b>	<b>4 472</b>	<b>5 277</b>	<b>4 506</b>	<b>3 924</b>	<b>4 230</b>	<b>3 921</b>	<b>4 285</b>

### Expenditure trends

Allocations over the MTEF period are R5.4 million in 2008/09, R5.6 million in 2009/10 and R5.9 million in 2010/11. The ASSAf has received additional ring-fenced allocations of R500 000 for each of the years over the MTEF period. Revenue is set to grow at an average annual rate of 3.8 per cent, from R6.7 million in 2008/09 to R7.2 million in 2010/11, with the most significant growth in 2010/11.

### Tshumisano Trust

Tshumisano Trust was registered by the former committee of technikon principals. Tshumisano Trust is a joint venture, funded by the Department of Science and Technology, with participation by the Department of Labour, universities of technology, and the German government's funding agency, GTZ.

The core focus of Tshumisano Trust is to leverage skills and product development support within universities of technology so that technology stations can provide support to small and medium sized businesses. The number of technology stations has expanded rapidly over the past few years to support previously underserved provinces, from the original 3 in 2002 to 12 in 2007. The technology stations increased assistance to SMEs by more than 37 per cent in 2006/07. The trust has also rolled out 3 institutes for advanced tooling, in Soshanguve (training and SME development), East London (design) and Stellenbosch (research and development). This is an important development given the skills shortage and innovation gap in the tooling industry.



**Selected performance indicators**

Indicators	Annual performance						
	Past			Current	Projected		
	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11
Number of projects and services	716	1 200	1 836	2 000	2 600	3 100	3 720
Number of SMEs assisted	448	787	1 083	533	1 500	1 800	2 160
Number of female-owned SMEs	100	155	221	66	318	381	460
Number of PDI-owned SMEs	154	355	200	117	290	350	420
Number of SMEs trained	197	107	332	157	400	450	550
Number of department-funded internship programmes	–	45	87	191	230	280	336

**Expenditure trends**

Allocations over the MTEF period are R41.4 million in 2008/09, R49.7 million in 2009/10 and R54.2 million in 2010/11. There are additional ring-fenced allocations of R13.5 million, R8.5 million and R7.5 million for each year. The entity's budget is set to grow from R55.5 million in 2008/09 to R62.2 million in 2010/11, at an average annual rate of 5.9 per cent, with the most significant growth in 2010/11.

## Additional tables

Table 31.A Summary of expenditure trends and estimates per programme and economic classification

Programme	Appropriation		Audited outcome	Appropriation			Revised estimate
	Main	Adjusted		Main	Additional	Adjusted	
R thousand	2006/07		2006/07	2007/08			2007/08
1. Administration	211 582	212 211	217 244	85 322	29 740	115 062	115 062
2. Research, Development and Innovation	415 654	50 556	404 767	546 551	(5 250)	541 301	534 301
3. International Co-operation and Resources	131 946	127 946	124 304	118 016	(14 240)	103 776	103 776
4. Human Capital and Knowledge Systems	850 071	1 638 930	876 121	1 257 329	(5 250)	1 252 079	1 252 079
5. Socio-Economic Partnerships	1 004 840	587 450	990 563	1 135 261	(3 250)	1 132 011	1 132 011
<b>Total</b>	<b>2 614 093</b>	<b>2 617 093</b>	<b>2 612 999</b>	<b>3 142 479</b>	<b>1 750</b>	<b>3 144 229</b>	<b>3 137 229</b>
<b>Economic classification</b>							
<b>Current payments</b>	<b>180 770</b>	<b>204 861</b>	<b>174 004</b>	<b>222 226</b>	<b>24 708</b>	<b>246 934</b>	<b>246 934</b>
Compensation of employees	93 107	86 957	83 743	112 964	1 897	114 861	114 861
Goods and services	87 663	117 904	90 173	109 262	22 811	132 073	132 073
Financial transactions in assets and liabilities	–	–	88	–	–	–	–
<b>Transfers and subsidies</b>	<b>2 299 469</b>	<b>2 268 551</b>	<b>2 293 388</b>	<b>2 917 799</b>	<b>(23 188)</b>	<b>2 894 611</b>	<b>2 887 611</b>
Provinces and municipalities	26	63	64	–	–	–	–
Departmental agencies and accounts	1 221 549	1 257 230	1 160 159	1 624 885	14 469	1 639 354	1 632 354
Universities and technikons	–	12 667	45 972	10 000	3 219	13 219	13 219
Public corporations and private enterprises	483 194	505 802	740 719	517 352	72 387	589 739	589 739
Non-profit institutions	594 700	492 545	345 490	765 562	(113 909)	651 653	651 653
Households	–	244	984	–	646	646	646
<b>Payments for capital assets</b>	<b>133 854</b>	<b>143 681</b>	<b>145 607</b>	<b>2 454</b>	<b>230</b>	<b>2 684</b>	<b>2 684</b>
Buildings and other fixed structures	133 000	133 000	133 174	–	–	–	–
Machinery and equipment	854	10 681	12 433	2 454	230	2 684	2 684
<b>Total</b>	<b>2 614 093</b>	<b>2 617 093</b>	<b>2 612 999</b>	<b>3 142 479</b>	<b>1 750</b>	<b>3 144 229</b>	<b>3 137 229</b>

Table 31.B Summary of personnel numbers and compensation of employees

	Audited outcome			Adjusted appropriation	Medium-term expenditure estimates		
	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11
<b>A. Permanent and full-time contract employees</b>							
Compensation (R thousand)	58 198	65 119	83 737	114 854	130 170	135 219	139 707
Unit cost (R thousand)	278	277	278	382	360	374	386
Personnel numbers (head count)	209	235	301	301	362	362	362
<b>B. Part-time and temporary contract employees</b>							
Compensation (R thousand)	6	6	6	7	–	–	–
Unit cost (R thousand)	0	0	0	0	–	–	–
Personnel numbers (head count)	28	31	33	33	–	–	–
<b>Total for department</b>							
<b>Compensation (R thousand)</b>	<b>58 204</b>	<b>65 125</b>	<b>83 743</b>	<b>114 861</b>	<b>130 170</b>	<b>135 219</b>	<b>139 707</b>
<b>Unit cost (R thousand)</b>	<b>246</b>	<b>245</b>	<b>251</b>	<b>344</b>	<b>360</b>	<b>374</b>	<b>386</b>
<b>Personnel numbers (head count)</b>	<b>237</b>	<b>266</b>	<b>334</b>	<b>334</b>	<b>362</b>	<b>362</b>	<b>362</b>

**Table 31.C Summary of expenditure on training**

	Audited outcome			Adjusted appropriation	Medium-term expenditure estimates		
	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11
Compensation of employees (R thousand)	58 204	65 125	83 743	114 861	130 170	135 219	139 707
Training expenditure (R thousand)	2 681	3 269	962	3 648	5 249	5 426	5 751
Training as percentage of compensation	5%	5%	1%	3%	4%	4%	4%
Total number trained in department (head count)	67	113	120	127			
<i>of which:</i>							
Employees receiving bursaries (head count)	22	37	38	41			

**Table 31.D Summary of expenditure on infrastructure**

Description	Service delivery outputs	Audited outcome			Adjusted appropriation	Medium-term expenditure estimate		
		2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11
R thousand								
<b>Infrastructure transfers to other spheres, agencies and departments</b>								
Research equipment		–	–	50 000	50 000	70 000	74 200	78 652
Research and development infrastructure		–	–	60 000	215 000	315 000	–	–
Science and Technology head office building		–	–	133 000	–	–	–	–
Research and development infrastructure		–	–	50 000	50 000	121 106	196 659	208 459
Frontier Science and Technology infrastructure		–	–	40 000	105 000	144 500	154 009	163 250
Square Kilometre Array infrastructure		–	–	–	80 000	265 000	471 900	500 214
Space infrastructure		–	–	20 000	20 000	15 000	15 000	15 900
Hydrogen Strategy		–	–	–	10 000	40 500	42 525	45 077
Infrastructure: Ten-year Innovation Plan		–	–	–	–	10 000	20 000	40 000
<b>Total</b>		–	–	<b>353 000</b>	<b>530 000</b>	<b>981 106</b>	<b>974 293</b>	<b>1 051 551</b>

