Vote 18

Science and Technology

	2004/05 To be appropriated	2005/06	2006/07
MTEF allocations	**R1 276 212 000**	**R1 515 493 000**	**R1 651 127 000**
Statutory amounts	**–**	**–**	**–**
Responsible Minister	Minister of Arts, Culture, Science and Technology		
Administering Department	Department of Science and Technology		
Accounting Officer	Director-General of Department of Science and Technology		

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 purpose and measurable objectives

Programme 1: Administration

Purpose: Provide policy leadership and advice as well as integrative and executive functions for science and technology and the department, focused on the implementation of the National Research and Development Strategy and maintaining a coherent set of indicators relevant to the National System of Innovation.

Programme 2: Technology for Development

Purpose: Improve quality of life, through access to and the spread of technology and by creating capacity and skills for innovation and the use of indigenous knowledge.

Measurable objective: Optimise knowledge transfer through the operation of programmes, instruments and partnerships, as measured by internationally accepted technology diffusion assessment methods.

Programme 3: International Co-operation and Resources

Purpose: Take responsibility for the development of bilateral and multilateral co-operation in science and technology to strengthen the National System of Innovation, and for a coherent strategic programme to access overseas development assistance for science and technology in South Africa and on the African continent.

Measurable objective: Increase flows of scientific knowledge and resources to South Africa through participation in joint programmes.

Programme 4: Government Science and Technology System

Purpose: Provide strategic direction, funding and support for the development and growth of the science and technology institutions of government.

Measurable objective: Build, fund and monitor a cohesive national research system that is run efficiently and effectively in order to contribute to technology advancement and service delivery, as determined by key performance indicators.

Programme 5: Science and Technology for Competitiveness

Purpose: Develop the technology missions, human capital and national science activities in support of the National System of Innovation.

Measurable objectives:

- Establish and leverage enhanced innovation through the technology missions identified in the National Research and Development Strategy, as measured by innovation surveys.
- Establish and grow national scientific programmes to fund human capital programmes to ensure sufficient and growing science, engineering and technology human resources for economic growth, as measured by widely accepted indicators.

Strategic overview and key policy developments: 2000/01 – 2005/06

Science and technology is a key driver of economic development and improvements in quality of life. This can be effected through new products and services, and enhancing existing products, services and production technologies. The Department of Science and Technology will provide strategic direction and support to scientific research and technology through the National System of Innovation.

During the first decade of South Africa's democracy, the department has set up key enabling policies and strategies within the National System of Innovation. These include the White Paper on Science and Technology, the technology foresight study, the national research and development strategy, the biotechnology strategy and other technology development support programmes.

From a budget and resource allocation perspective, the department focuses on two major areas. First, it oversees and manages the Science vote process in relation to allocations to the science councils. This involves both councils reporting to the department itself and those reporting to other departments, such as health, agriculture, minerals and energy, and trade and industry. It allows for re-prioritisation within and steering of the National System of Innovation. The second focus is the department's operational budget.

The department's programmes involve targeted funding of the science councils, other science, engineering and technology institutions, parastatals and the private sector to achieve specific outputs. Departmental activities relate to developing and implementing strategy, international relations (including NEPAD and key multilateral activities) and monitoring and evaluating the National System of Innovation.

The dominant priority over the medium term is the funding of the National Research and Development Strategy and the phasing of this expenditure to achieve coherent and integrated outputs. Key aspects of this process include:

- targeted adjustments to the baseline of Science vote institutions and programmes
- a wider range of funding instruments to be used by the Innovation Fund
- financing of the national biotechnology mission, and stimulation of the technology and innovation missions for, among others, advanced manufacturing
- strengthening the technology transfer and incubation initiatives
- launching the Centres of Excellence programmes and science platform investments

- prioritising the sourcing of new funding from partner departments in South Africa as well as overseas development assistance.

Technology missions

The technology missions include the key technology platforms of the modern age – biotechnology and IT. Three other missions are technology for manufacturing, technology to leverage knowledge, and technology from the natural resources sectors. Finally, a technology for poverty reduction mission will be established. The initial focus is on the National Biotechnology Strategy, but start-up finance is also provided for the other technology missions.

The National System of Innovation

The National System of Innovation focuses on the role of technology in economic growth, and supports innovation and technology diffusion. Since 1994, institutions such as the National Advisory Council on Innovation have been established to advise the Minister on policy and the allocation of funding. Some funds allocated to the science councils were earmarked to address specific South African problems. The funding of science councils has been substantially reformed: core funding through parliamentary grants is complemented with allocations through a competitive bidding process from the Innovation Fund. The Innovation Fund applies three major criteria when making its selections: competitiveness, quality of life, and environmental sustainability. Although setting up institutions and realigning funding mechanisms has received substantial attention, the National System of Innovation has already started delivering results. Projects funded from the Innovation Fund have led to the creation of new businesses, products and services in the marketplace.

The National Biotechnology Strategy

Implementation of the National Biotechnology Strategy gained momentum in 2003 following the establishment of three Biotechnology Regional Innovation Centres (BRICs), the National Bio-informatics Facility, and a public awareness programme. The function of the centres is to provide financial support to consortia that include small entrepreneurs and other private sector partners, to create new businesses and technology platforms. The strategy addresses new developments in biotechnology and South Africa's vulnerability regarding the exploitation of its biodiversity and indigenous knowledge. The department allocated a significant amount of funding to show its commitment to developing the biotechnology mission as a priority.

The National Research and Development Strategy

The National Research and Development Strategy focuses on three broad areas:

- Innovation enhancement, primarily through technology missions: The emphasis is on technological innovation, demonstrating technology, incubating new technology-based businesses, and enhancing networks of knowledge workers and organisations in specific areas of technology.
- Strengthening science, engineering and technology human resources and transformation: Here the emphasis is on establishing centres of excellence; establishing and funding networks for NEPAD and SADC; strengthening global science networks; formulating strategies aimed at sourcing new financing for R&D equipment; strengthening institutional and individual research capacity in science focus areas through the National Research Foundation; and increasing public understanding and the number of public engagement activities.
- Creating an effective government science and technology system: There needs to be a clear distinction between the roles of the line-function departments and the integrative role of the

Department of Science and Technology. This focus area is involved in: generating three-year R&D plans for science councils in line with the MTEF process; developing standard reporting frameworks and a performance management system for all institutions; and giving the department central responsibility for producing an integrative budget for all science and technology initiatives.

The National Research and Development Strategy faces a number of key challenges, including working in the context of a decline in national R&D spending. Spending declined from 1,1 per cent of GDP in 1990 to about 0,7 per cent in 1994. From a budget perspective, there is no overall view of science and technology spending by government, since this is spread across many departments. The science and technology system also needs to be consolidated and its steering mechanisms improved, and the national science and technology system at strategic level needs to be better integrated to ensure efficient and effective utilisation of public funds. Another challenge is the need to find adequate responses to new diseases, and new forms of old diseases, affecting humans and animals.

Developing human resources

Human resource development is rooted in the dual need to radically increase the number of women and people from previously disadvantaged communities entering and remaining in the sciences, and maximise the pursuit of excellence. National excellence can be achieved by focusing basic science on areas where success is most likely because of important natural or knowledge advantages. These include astronomy, human palaeontology and indigenous knowledge. The key institution for promoting science in this way is the NRF, linked to the higher education sector through the National Plan for Higher Education.

Expenditure estimates

Table 18.1: Science and Technology

Programme	Expenditure outcome					Medium-term expenditure estimate		
	Audited	Audited	Preliminary outcome	Adjusted appropriation	Revised estimate			
R thousand	2000/01	2001/02	2002/03	2003/04		2004/05	2005/06	2006/07
1 Administration	18 279	23 227	37 421	30 803	55 328	60 921	65 522	71 212
2 Technology for Development	130 482	174 423	112 945	204 784	198 384	264 297	298 686	320 908
3 International Co-operation and Resources	12 180	15 235	30 512	43 942	40 427	46 186	75 123	81 993
4 Government Science and Technology System	5 244	7 663	12 855	15 148	13 937	16 197	16 460	17 457
5 Science and Technology for Competitiveness	416 601	480 947	608 168	773 594	760 195	888 611	1 059 702	1 159 557
Total	**582 786**	**701 495**	**801 901**	**1 068 271**	**1 068 271**	**1 276 212**	**1 515 493**	**1 651 127**
Change to 2003 Budget Estimate				37 746	37 746	122 802	151 510	
Economic classification								
Current payments	**33 267**	**42 124**	**77 873**	**78 784**	**98 349**	**109 235**	**115 072**	**124 536**
Compensation of employees	18 906	25 507	31 756	52 162	50 167	66 461	70 196	74 405
Goods and services	14 361	16 617	46 110	26 622	48 182	42 774	44 876	50 131
Interest and rent on land	–	–	–	–	–	–	–	–
Financial transactions in assets and liabilities	–	–	7	–	–	–	–	–
Unauthorised expenditure	–	–	–	–	–	–	–	–

	Expenditure outcome					Medium-term expenditure estimate		
	Audited	Audited	Preliminary outcome	Adjusted appropriation	Revised estimate			
R thousand	2000/01	2001/02	2002/03	2003/04		2004/05	2005/06	2006/07
Transfers and subsidies to:	**548 579**	**655 544**	**719 727**	**987 523**	**967 958**	**1 165 962**	**1 399 554**	**1 525 671**
Provinces and municipalities	63	85	106	205	205	220	232	247
Departmental agencies and accounts	548 516	655 459	719 621	987 318	967 753	1 161 742	1 394 322	1 519 424
Universities and technikons	–	–	–	–	–	–	–	–
Foreign governments & international organisations	–	–	–	–	–	–	–	–
Public corporations & private enterprises	–	–	–	–	–	–	–	–
Non-profit institutions	–	–	–	–	–	–	–	–
Households	–	–	–	–	–	4 000	5 000	6 000
Payments for capital assets	**940**	**3 827**	**4 301**	**1 964**	**1 964**	**1 015**	**867**	**920**
Buildings and other fixed structures	–	–	–	–	–	–	–	–
Machinery and equipment	940	3 827	4 301	1 964	1 964	1 015	867	920
Cultivated assets	–	–	–	–	–	–	–	–
Software and other intangible assets	–	–	–	–	–	–	–	–
Land and subsoil assets	–	–	–	–	–	–	–	–
Total	**582 786**	**701 495**	**801 901**	**1 068 271**	**1 068 271**	**1 276 212**	**1 515 493**	**1 651 127**

Expenditure trends

The 2003 Budget provided additional resources to launch the National Research and Development Strategy, and enabled new and additional allocations to a range of institutions and programmes. The Science vote represents core funding for key science councils and national R&D financing programmes. It has grown at an average annual rate of 9,2 per cent over the period 2000/01 to 2003/04, with above average increases in expenditure for the Medical Research Council, the Innovation Fund, the National Research Foundation and the Africa Institute of South Africa. Growth in the Science vote increases at an annual average rate of 12,5 per cent over the 2004 MTEF period. This is mainly due to a baseline adjustment of R40,0 million, R70,0 million and R150,0 million to accommodate the establishment of the National Energy Research Institute and the further implementation of the National Research and Development Strategy, and to allow for growth in the funding of science councils.

The department's expenditure has grown at an annual average rate of 22,4 per cent between 2000/01 and 2003/04, and continues to grow at an annual average rate of 15,6 per cent over the MTEF period. The growth is possible because of additions to the 2003 MTEF allocations (R122,8 million in 2004/05 and R151,5 million in 2005/06) mostly to allow for the further implementation of the National Research and Development Strategy.

Science and Technology for Competitiveness dominates the department's budget at an average of 70,0 per cent over the medium term. A significant portion (78,9 per cent) of the expenditure under this programme over the medium term consists of transfer payments related to the National Biotechnology Strategy, the Innovation Fund and the National Research Foundation.

Departmental receipts

Departmental receipts are mainly miscellaneous items such as debt repayments and private telephone calls. All receipts are deposited into the National Revenue Fund.

Table 18.2: Departmental receipts

	Revenue outcome				Medium-term revenue estimate		
	Audited	Audited	Preliminary outcome	Adjusted appropriation			
R thousand	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07
Tax receipts	–	–	–	–	–	–	–
Sales of goods and services produced by department (excl capital assets)	–	–	6	1	13	15	17
Sales of scrap, waste, arms and other used current goods (excl capital assets)	–	–	–	–	–	–	–
Transfers received	–	–	–	–	–	–	–
Fines, penalties and forfeits	–	–	–	–	–	–	–
Interest, dividends and rent on land	–	–	–	1	6	6	6
Sales of capital assets	–	–	–	–	–	–	–
Financial transactions in assets and liabilities	–	–	4	1	2	2	2
Total departmental receipts	**–**	**–**	**10**	**3**	**21**	**23**	**25**

Programme 1: Administration

Administration provides policy leadership and advice, integrative functions across the department and the broader science and technology system, and services to the Minister, focused on the implementation of the National Research and Development Strategy. The programme includes funding the National Advisory Council on Innovation, which plays a key role in advising the Minister and the department on the allocation of funding. In addition to subprogrammes for supporting the offices of the Minister, the Deputy Minister and top management, this programme also funds interfaces between the department and the National Advisory Council on Innovation.

Expenditure estimates

Table 18.3: Administration

Subprogramme	Expenditure outcome				Medium-term expenditure estimate		
	Audited	Audited	Preliminary outcome	Adjusted appropriation			
R thousand	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07
Minister[1]	730	753	685	746	791	831	872
Deputy Minister[2]	571	622	1 024	607	643	675	709
Management	3 788	4 875	5 757	3 808	3 690	3 912	4 147
Core Support Services	11 162	14 367	29 955	19 386	49 297	52 604	56 984
Policy Support Services	2 028	2 610	–	6 256	6 500	7 500	8 500
Total	**18 279**	**23 227**	**37 421**	**30 803**	**60 921**	**65 522**	**71 212**
Change to 2003 Budget Estimate				–	26 773	30 789	

1 Payable as from 1 April 2003. Salary: R597 228. Car allowance: R149 307.

2 Payable as from 1 April 2003. Salary: R485 412. Car allowance: R121 353.

	Expenditure outcome				Medium-term expenditure estimate		
	Audited	Audited	Preliminary outcome	Adjusted appropriation			
R thousand	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07
Economic classification							
Current payments	**17 924**	**22 069**	**35 068**	**30 431**	**55 490**	**60 140**	**65 508**
Compensation of employees	10 690	13 951	18 073	21 651	23 328	24 639	26 115
Goods and services	7 234	8 118	16 988	8 780	32 162	35 501	39 393
Interest and rent on land	–	–	–	–	–	–	–
Financial transactions in assets and liabilities	–	–	7	–	–	–	–
Unauthorised expenditure	–	–	–	–	–	–	–
Transfers and subsidies to:	**35**	**46**	**60**	**72**	**5 077**	**5 082**	**5 386**
Provinces and municipalities	35	46	60	72	77	82	86
Departmental agencies and accounts	–	–	–	–	5 000	5 000	5 300
Universities and technikons	–	–	–	–	–	–	–
Foreign governments & international organisations	–	–	–	–	–	–	–
Public corporations & private enterprises	–	–	–	–	–	–	–
Non-profit institutions	–	–	–	–	–	–	–
Households	–	–	–	–	–	–	–
Payments for capital assets	**320**	**1 112**	**2 293**	**300**	**354**	**300**	**318**
Buildings and other fixed structures	–	–	–	–	–	–	–
Machinery and equipment	320	1 112	2 293	300	354	300	318
Cultivated assets	–	–	–	–	–	–	–
Software and other intangible assets	–	–	–	–	–	–	–
Land and subsoil assets	–	–	–	–	–	–	–
Of which: Capitalised compensation	–	–	–	–	–	–	–
Total	**18 279**	**23 227**	**37 421**	**30 803**	**60 921**	**65 522**	**71 212**

Details of transfer payments and subsidies:

Provinces and municipalities							
Municipalities							
Current	**35**	**46**	**60**	**72**	**77**	**82**	**86**
Regional Services Council levies	35	46	60	72	77	82	86
Departmental agencies and accounts (Entities)							
Current	**-**	**-**	**-**	**-**	**5 000**	**5 000**	**5 300**
Policy Support Services	-	-	-	-	-	-	-
National Advisory Council on Innovation	-	-	-	-	5 000	5 000	5 300
Total	**35**	**46**	**60**	**72**	**5 077**	**5 082**	**5 386**

Expenditure trends

Administration shows an average growth rate of 19,0 per cent over the period 2000/01 to 2003/04. Compensation of employees grew strongly in 2002/03 as a result of the establishment of the new Department of Science and Technology to implement the National Research and Development Strategy. The department went through an exercise to ensure that expenditure is located in the programme where it occurs, which resulted in the shifting of funds from the other programmes to *Administration* and explains the programme's increase from 2003/04 to 2004/05. *Administration* expenditure stabilises somewhat over the medium term, but still allows for the extension of the department's key mandates.

Programme 2: Technology for Development

Technology for Development aims to improve quality of life through access to and the spread of technology, and by creating capacity and skills for innovation and the use of indigenous knowledge. Through its two subprogrammes, it focuses on using science and technology to reduce poverty and improve quality of life, including through the involvement of the public and private sectors and using labour-intensive technologies, and on increasing access to and the use of IT to improve government procurement procedures. This programme is responsible for developing and supporting South Africa's indigenous knowledge systems through policy and legislative interventions. It is also responsible for the development of institutional capacity for technology transfer in relation to innovation initiatives.

Expenditure estimates

Table 18.4: Technology for Development

Subprogramme	Expenditure outcome				Medium-term expenditure estimate		
	Audited	Audited	Preliminary outcome	Adjusted appropriation			
R thousand	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07
Technology Transfer	49 309	76 537	24 397	97 339	105 113	119 672	124 677
Poverty Reduction	81 173	97 886	88 548	107 445	159 184	179 014	196 231
Total	**130 482**	**174 423**	**112 945**	**204 784**	**264 297**	**298 686**	**320 908**
Change to 2003 Budget Estimate				7 847	61 100	66 480	
Economic classification							
Current payments	**3 265**	**4 231**	**9 305**	**10 754**	**11 386**	**11 632**	**12 628**
Compensation of employees	1 697	2 387	2 976	8 811	9 081	9 589	10 174
Goods and services	1 568	1 844	6 329	1 943	2 305	2 043	2 454
Interest and rent on land	–	–	–	–	–	–	–
Financial transactions in assets and liabilities	–	–	–	–	–	–	–
Unauthorised expenditure	–	–	–	–	–	–	–
Transfers and subsidies to:	**127 046**	**169 642**	**103 199**	**193 906**	**252 766**	**286 939**	**308 158**
Provinces and municipalities	6	8	10	29	30	32	34
Departmental agencies and accounts	127 040	169 634	103 189	193 877	248 736	281 907	302 124
Universities and technikons	–	–	–	–	–	–	–
Foreign governments & international organisations	–	–	–	–	–	–	–
Public corporations & private enterprises	–	–	–	–	–	–	–
Non-profit institutions	–	–	–	–	–	–	–
Households	–	–	–	–	4 000	5 000	6 000
Payments for capital assets	**171**	**550**	**441**	**124**	**145**	**115**	**122**
Buildings and other fixed structures	–	–	–	–	–	–	–
Machinery and equipment	171	550	441	124	145	115	122
Cultivated assets	–	–	–	–	–	–	–
Software and other intangible assets	–	–	–	–	–	–	–
Land and subsoil assets	–	–	–	–	–	–	–
Of which: Capitalised compensation	–	–	–	–	–	–	–
Total	**130 482**	**174 423**	**112 945**	**204 784**	**264 297**	**298 686**	**320 908**
Technology Transfer	49 309	76 537	24 397	97 339	105 113	119 672	124 677

	Expenditure outcome				Medium-term expenditure estimate		
	Audited	Audited	Preliminary outcome	Adjusted appropriation			
R thousand	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07
Details of transfer payments and subsidies:							
Provinces and municipalities							
Municipalities							
Current	**6**	**8**	**10**	**29**	**30**	**32**	**34**
Regional Services Council levies	6	8	10	29	30	32	34
Departmental agencies and accounts (Entities)							
Current	**127 040**	**169 634**	**103 189**	**193 877**	**248 736**	**281 907**	**302 124**
Technology Transfer							
Technology Planning and Diffusion	47 588	74 142	19 452	53 297	47 900	56 300	58 558
National Public Assets	-	-	-	30 000	35 000	40 000	40 000
Indigenous Knowledge Systems	-	-	650	6 350	10 000	10 000	10 000
Poverty Reduction							
Human Sciences Research Council	61 452	65 492	65 087	70 030	82 836	88 107	100 566
Technology for Poverty Alleviation	-	-	-	12 200	28 000	40 500	40 000
Agricultural Processing Programme	18 000	30 000	18 000	22 000	45 000	47 000	53 000
Households (Other transfers to households)							
Current	**-**	**-**	**-**	**-**	**4 000**	**5 000**	**6 000**
Technology Transfer							
Learnerships	-	-	-	-	4 000	5 000	6 000
Total	**127 046**	**169 642**	**103 199**	**193 906**	**252 766**	**286 939**	**308 158**

Expenditure trends

Technology for Development increases significantly over the medium term, at an annual average rate of 16,2 per cent, as a result of increased allocations to interventions related to the National Research and Development Strategy, and particularly setting technology for poverty reduction as a high priority. The programme also provides for the core government funding to the Human Sciences Research Council which reflects strong average annual growth of 12,8 per cent over the medium term. The 2004 MTEF allocations also provide for the continuation of the funding of the programmes for enabling technology and agricultural processing (R45,0 million, R47,0 million and R53,0 million over the three years respectively) that were previously funded through the special allocation for poverty relief.

Service delivery objectives and indicators

Recent outputs

The *Technology for Development* programme has increased the facilitation of access to and use of technology by means of the Godisa and Tshumisano trusts. Through the Godisa programme eight centres have been established to focus mainly on incubation (support for small entities for developing emerging technologies), with one technology demonstration centre and one innovation support centre. The development of two incubators is at an advanced stage. The Tshumisano Trust, which focuses on capacity-building at technikons and technology services to SMMEs, established seven technology stations in 2002/03.

During 2003, four new community projects that aim at reducing poverty and improving the quality of life by creating employment and reducing food insecurity were established. In some cases

SMMEs were also established in partnerships with science councils and higher education institutions. These projects are in agriculture and agro-processing, energy and health. There has been significant progress in the production of essential oils and mushrooms, and in beekeeping, since the 2002/03 financial year. Sustainable SMMEs have been established in these industries. New initiatives are under way in medicinal plant production, energy, small-scale mining, jewellery manufacturing and glass beads production.

Poverty reduction projects are concentrated in the poverty nodes and have yielded over 2 899 job opportunities since April 2002 (employing 1 675 women, 862 young people and 68 people with disabilities). Research on current projects will yield information on best practice for transferring technology for poverty reduction in agriculture, small-scale mining, health and energy, as well as a draft policy on Technology for Poverty Reduction.

Medium-term output targets

Technology for Development

Measurable objective: Optimise knowledge transfer through the operation of programmes, instruments and partnerships, as measured by internationally accepted technology diffusion assessment methods.

Subprogramme	Output	Measure/Indicator	Target
Technology Transfer	Institutional mechanisms for promoting the uptake and spread of new and existing technologies	Regions and technology areas covered by Godisa and Tshumisano programmes	Increase the number of SMMEs under the incubators from 8 to 16
			Double number of clients serviced by the technology stations
	Technically-based learnerships	Number of learnerships	420 learnerships placed in 2004/05
Poverty Reduction	Community-based science and technology projects to reduce poverty and create jobs	Increased number of areas of technology where small business creation projects are being supported	4 additional technology-based small businesses created by March 2005
			Expansion of projects in 2 technologybased micro-businesses by March 2005
		Extent of interventions promoting technologies for medical and health products	Current interventions to be evaluated in early 2004 as well as scoping of larger scale interventions
		Completion of research projects aimed at informing best practice and policy development of technology-based poverty reduction projects	At least two projects completed and draft policy developed by March 2005

Programme 3: International Co-operation and Resources

Through its two subprogrammes, *International Co-operation and Resources* is responsible for the development of bilateral and multilateral co-operation in science and technology to strengthen the National System of Innovation, and for a coherent strategic programme to access overseas development assistance for science and technology in South Africa and on the African continent.

- International Co-operation is responsible for the funding of the Africa Institute of South Africa as well as for financial support to various institutions in support of international science programmes, referred to as Global Science.
- International Resources was established in 2003/04 and provides assistance, locally, as well as for Africa, in accessing international resources for science and technology.

Expenditure estimates

Table 18.5: International Co-operation and Resources

Subprogramme	Expenditure outcome				Medium-term expenditure estimate		
	Audited	Audited	Preliminary outcome	Adjusted appropriation			
R thousand	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07
International Co-operation	12 180	15 235	30 512	40 726	41 788	70 595	77 221
International Resources	–	–	–	3 216	4 398	4 528	4 772
Total	**12 180**	**15 235**	**30 512**	**43 942**	**46 186**	**75 123**	**81 993**
Change to 2003 Budget Estimate				1 228	1 900	1 960	
Economic classification							
Current payments	**4 549**	**6 172**	**9 371**	**10 842**	**12 676**	**12 997**	**13 959**
Compensation of employees	2 688	3 781	3 001	8 886	10 361	10 953	11 582
Goods and services	1 861	2 391	6 370	1 956	2 315	2 044	2 377
Interest and rent on land	–	–	–	–	–	–	–
Financial transactions in assets and liabilities	–	–	–	–	–	–	–
Unauthorised expenditure	–	–	–	–	–	–	–
Transfers and subsidies to:	**7 360**	**8 191**	**20 678**	**32 970**	**33 360**	**61 996**	**67 896**
Provinces and municipalities	9	13	10	29	35	36	39
Departmental agencies and accounts	7 351	8 178	20 668	32 941	33 325	61 960	67 857
Universities and technikons	–	–	–	–	–	–	–
Foreign governments & international organisations	–	–	–	–	–	–	–
Public corporations & private enterprises	–	–	–	–	–	–	–
Non-profit institutions	–	–	–	–	–	–	–
Households	–	–	–	–	–	–	–
Payments for capital assets	**271**	**872**	**463**	**130**	**150**	**130**	**138**
Buildings and other fixed structures	–	–	–	–	–	–	–
Machinery and equipment	271	872	463	130	150	130	138
Cultivated assets	–	–	–	–	–	–	–
Software and other intangible assets	–	–	–	–	–	–	–
Land and subsoil assets	–	–	–	–	–	–	–
Of which: Capitalised compensation	–	–	–	–	–	–	–
Total	**12 180**	**15 235**	**30 512**	**43 942**	**46 186**	**75 123**	**81 993**
Details of transfer payments and subsidies:							
Provinces and municipalities							
Municipalities							
Current	**9**	**13**	**10**	**29**	**35**	**36**	**39**
Regional Services Council levies	9	13	10	29	35	36	39
Departmental agencies and accounts (Entities)							
Current	**7 351**	**8 178**	**20 668**	**32 941**	**33 325**	**61 960**	**67 857**
International Co-operation	-	-	-	-	-	-	-
Global Science	-	-	11 687	21 228	17 000	44 000	47 000
Africa Institute of South Africa	7 351	8 178	8 981	11 713	16 325	17 960	20 857
Total	**7 360**	**8 191**	**20 678**	**32 970**	**33 360**	**61 996**	**67 896**

Expenditure trends

After growing at an average annual rate of 53,4 per cent over the period 2000/01 to 2003/04, the allocation for *International Co-operation and Resources* is more stable at an annual average rate of

23,1 per cent over the medium term, but still nearly doubles from R43,9 million in 2003/04 to R81,9 million in 2006/07. This increase is mainly due to the transfer payments to various institutions in support of international science programmes, under the broad category Global Science. Global Science and the transfers to the Africa Institute of South Africa dominate expenditure on the programme at an average of 80,3 per cent over the medium term.

Service delivery objectives and indicators

Recent outputs

During 2002/03 the department invested a total of R13,0 million towards implementing over 385 R&D projects. It has also facilitated the interaction between South African scientists and those in partner institutions in other countries. In most cases partner countries have invested even more, so that for every R1 invested by South Africa, the partner country invests R3.

South Africa hosted and chaired the inaugural NEPAD Ministerial Conference on Science and Technology during May 2003, at which a Plan of Action was adopted that outlines flagship programmes in 12 priority areas that are crucial for sustainable development in Africa. The conference established a governance structure to oversee the implementation of the NEPAD science and technology programme to be chaired by South Africa for the next two years.

Within SADC, the Department of Science and Technology has led the science and technology policy development programme of the region with the result that almost all SADC member states have such policies in place. The department also contributed to the science and technology component of SADC's Regional Indicative Strategic Development Plan, a blueprint for SADC activities for the next 15 years, thus ensuring the integration of science and technology in its development agenda.

The department promoted South African participation in international research funding programmes such as the European Union's Sixth Framework Programme. It has also been responsible for strategic multilateral engagements such as the preparation of an Organisation for Economic Co-operation and Development (OECD) Ministerial Declaration on Science and Technology for Sustainable Development, and the reform of the Commonwealth Science Council.

The department is currently establishing a technology intelligence capacity to enhance its ability to monitor and evaluate new international technology and trends, and to leverage South Africa's competitive advantage in new and innovative technologies internationally.

Medium-term output targets

International Co-operation and Resources

Measurable objective: Increase flows of scientific knowledge and resources to South Africa through participation in joint programmes.			
Subprogramme	**Output**	**Measure/Indicator**	**Target**
International Co-operation	Bilateral and multilateral co-operation on science and technology	Extent of flow of knowledge, people and skills	Meet objectives in business plans to increase the mobility of scientists
International Resources	Official development assistance and other resource flows for science and technology in South Africa and Africa	Level of assistance and other resource flows for science and technology	Assistance and other resource flows should match 50% of increase in Science vote over 3 years

Programme 4: Government Science and Technology System

Government Science and Technology System provides strategic direction, funding and support for the development and growth of government's science and technology institutions. This objective is met through two subprogrammes as follows:

- Funding of Public Research Institutions is responsible for developing frameworks for the allocation of grant funding for science, engineering and technology activities and for public research institutions in particular. It also facilitates the development of sector-focused medium-term research and development plans in co-ordination with science councils and their respective line departments.
- Internal Governance ensures that funded institutions comply with good governance standards, including compliance with the Public Finance Management Act (1 of 1999), and that good practices are aligned with the strategic focus of the National System of Innovation.

Expenditure estimates

Table 18.6: Government Science and Technology System

Subprogramme	Expenditure outcome				Medium-term expenditure estimate		
	Audited	Audited	Preliminary outcome	Adjusted appropriation			
R thousand	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07
Funding of Public Research Institutions	3 210	3 870	7 571	8 283	8 861	9 108	9 659
Internal Governance	2 034	3 793	5 284	6 865	7 336	7 352	7 798
Total	**5 244**	**7 663**	**12 855**	**15 148**	**16 197**	**16 460**	**17 457**
Change to 2003 Budget Estimate				200	(283)	(302)	
Economic classification							
Current payments	**5 056**	**6 702**	**10 959**	**12 174**	**13 488**	**13 776**	**14 261**
Compensation of employees	2 920	4 106	3 508	6 386	10 758	11 359	12 049
Goods and services	2 136	2 596	7 451	5 788	2 730	2 417	2 212
Interest and rent on land	–	–	–	–	–	–	–
Financial transactions in assets and liabilities	–	–	–	–	–	–	–
Unauthorised expenditure	–	–	–	–	–	–	–
Transfers and subsidies to:	**10**	**14**	**1 362**	**2 324**	**2 535**	**2 537**	**3 040**
Provinces and municipalities	10	14	12	34	35	37	40
Departmental agencies and accounts	–	–	1 350	2 290	2 500	2 500	3 000
Universities and technikons	–	–	–	–	–	–	–
Foreign governments & international organisations	–	–	–	–	–	–	–
Public corporations & private enterprises	–	–	–	–	–	–	–
Non-profit institutions	–	–	–	–	–	–	–
Households	–	–	–	–	–	–	–
Payments for capital assets	**178**	**947**	**534**	**650**	**174**	**147**	**156**
Buildings and other fixed structures	–	–	–	–	–	–	–
Machinery and equipment	178	947	534	650	174	147	156
Cultivated assets	–	–	–	–	–	–	–
Software and other intangible assets	–	–	–	–	–	–	–
Land and subsoil assets	–	–	–	–	–	–	–
Of which: Capitalised compensation	–	–	–	–	–	–	–
Total	**5 244**	**7 663**	**12 855**	**15 148**	**16 197**	**16 460**	**17 457**

	Expenditure outcome				Medium-term expenditure estimate		
	Audited	Audited	Preliminary outcome	Adjusted appropriation			
R thousand	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07
Details of transfer payments and subsidies:							
Provinces and municipalities							
Municipalities							
Current	**10**	**14**	**12**	**34**	**35**	**37**	**40**
Regional Services Council levies	10	14	12	34	35	37	40
Departmental agencies and accounts (Entities)							
Current	**-**	**-**	**1 350**	**2 290**	**2 500**	**2 500**	**3 000**
Academy of Science of South Africa	-	-	1 350	2 290	2 500	2 500	3 000
Total	**10**	**14**	**1 362**	**2 324**	**2 535**	**2 537**	**3 040**

Expenditure trends

In recent years, but particularly in 2002/03, capacity to oversee and monitor government's science and technology institutions has been strengthened, explaining the strong annual average growth of 42,4 per cent in the programme from 2000/01 to 2003/04. This programme is dominated by compensation of employees (68,2 per cent over the medium term), and includes the transfer to the Academy of Science of South Africa.

Service delivery objectives and indicators

Recent outputs

During 2003/04 the department started to focus on the process to improve the effectiveness and efficiency of the science and technology system by assessing the appropriate location of activities within government structures. Approval was received for the scientific research function of the South African National Antarctic Programme to be transferred from the Department of Environmental Affairs and Tourism to the Department of Science and Technology as well as the transfer of the National Zoological Gardens from the Department of Arts and Culture. The placement of both functions with the Department of Science and Technology will take effect on 1 April 2004.

With the greater focus on science and technology institutions as a result of the establishment of a separate department for science and technology, changes are being introduced, and further changes envisaged, to the process for determining government financial support to these institutions. Improved co-ordination takes place between the department and other responsible line departments on R&D strategies. Consideration has been given for the incorporation of other government research institutions into the Science vote in order to ensure increased strategic co-ordination and oversight. This process is ongoing.

The department started to investigate a new approach to evaluate the science, engineering and technology system and the institutions. The new approach will be introduced as soon as investigations have been concluded and all stakeholders were consulted. These would enable National Advisory Council on Innovation to advise the Minister of Arts, Culture, Science and Technology on a more appropriate distribution of the Science vote.

Medium-term output targets

Government Science and Technology System

Measurable objective: Build, fund and monitor a cohesive national research system that is run efficiently and effectively in order to contribute to technology advancement and service delivery, as determined by key performance indicators.			
Subprogramme	**Output**	**Measure/Indicator**	**Target**
Funding of Public Research Institutions	Coherent, effective and efficient science and technology system	Number of science councils transferred to the Department of Science and Technology	5 additional science councils transferred
		Alignment of departmental and science council R&D plans with the National Research and Development Strategy (NRDS)	R&D plans in place in key line departments (trade and industry, health, agriculture, and minerals and energy)
		Institutional investment portfolio in line with NRDS	Full scope of government science and technology activity captured in Science vote by 2006
		Science Council performance against institutional and key performance targets	Ongoing evaluation of the performance of institutions relative to targets
Internal Governance	Effective and efficient utilisation of public resources	Prescribed reports and submissions on time	Compliance with PFMA, MTEF and MTSF requirements for reporting and submissions

Programme 5: Science and Technology for Competitiveness

Science and Technology for Competitiveness develops the technology missions, human capital formation and national science activities in support of the National System of Innovation. Activities are divided into two subprogrammes and involve all functions related to establishing and driving the technology missions.

- Technology Missions establishes and drives the key technology missions in the National Research and Development Strategy in collaboration with the government research system, the private sector and the higher education sector. It also develops frameworks and instruments for supporting the broader innovation activities of government and enhances the engagement with and investment in R&D by the private sector, in particular the venture capital industry. It increases and leverages intellectual capital developed through publicly financed research.
- Science Missions and Human Capital supports the development of human capital and knowledge through the promotion of education and research in scientific disciplines. The current science missions focus on astronomy and earth observation, bioscience and bio-resources, palaeontology and palaeo-anthropology and on the Antarctic, islands and oceans research.

Expenditure estimates

Table 18.7: Science and Technology for Competitiveness

Subprogramme	Expenditure outcome				Medium-term expenditure estimate		
	Audited	Audited	Preliminary outcome	Adjusted appropriation			
R thousand	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07
Technology Missions	114 558	127 496	190 695	307 365	385 066	508 499	545 168
Science Missions and Human Capital	302 043	353 451	417 473	466 229	503 545	551 203	614 389
Total	**416 601**	**480 947**	**608 168**	**773 594**	**888 611**	**1 059 702**	**1 159 557**
Change to 2003 Budget Estimate				28 471	33 312	52 583	
Economic classification							
Current payments	**2 473**	**2 950**	**13 170**	**14 583**	**16 195**	**16 527**	**18 180**
Compensation of employees	911	1 282	4 198	6 428	12 933	13 656	14 485
Goods and services	1 562	1 668	8 972	8 155	3 262	2 871	3 695
Interest and rent on land	–	–	–	–	–	–	–
Financial transactions in assets and liabilities	–	–	–	–	–	–	–
Unauthorised expenditure	–	–	–	–	–	–	–
Transfers and subsidies to:	**414 128**	**477 651**	**594 428**	**758 251**	**872 224**	**1 043 000**	**1 141 191**
Provinces and municipalities	3	4	14	41	43	45	48
Departmental agencies and accounts	414 125	477 647	594 414	758 210	872 181	1 042 955	1 141 143
Universities and technikons	–	–	–	–	–	–	–
Foreign governments & international organisations	–	–	–	–	–	–	–
Public corporations & private enterprises	–	–	–	–	–	–	–
Non-profit institutions	–	–	–	–	–	–	–
Households	–	–	–	–	–	–	–
Payments for capital assets	**–**	**346**	**570**	**760**	**192**	**175**	**186**
Buildings and other fixed structures	–	–	–	–	–	–	–
Machinery and equipment	–	346	570	760	192	175	186
Cultivated assets	–	–	–	–	–	–	–
Software and other intangible assets	–	–	–	–	–	–	–
Land and subsoil assets	–	–	–	–	–	–	–
Of which: Capitalised compensation	–	–	–	–	–	–	–
Total	**416 601**	**480 947**	**608 168**	**773 594**	**888 611**	**1 059 702**	**1 159 557**
Details of transfer payments and subsidies:							
Provinces and municipalities							
Municipalities							
Current	**3**	**4**	**14**	**41**	**43**	**45**	**48**
Regional Services Council levies	3	4	14	41	43	45	48

	Expenditure outcome				Medium-term expenditure estimate		
	Audited	Audited	Preliminary outcome	Adjusted appropriation			
R thousand	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07
Departmental agencies and accounts (Entities)							
Current	**412 772**	**475 324**	**568 026**	**746 007**	**868 181**	**1 038 715**	**1 136 643**
Technology Missions							
Biotechnology Strategy	-	-	41 850	118 949	125 000	155 000	158 586
Information Communication Technology	-	-	-	5 000	9 000	19 000	20 200
Natural Resources	-	-	-	1 000	10 000	28 000	30 000
Advanced Manufacturing	-	-	-	2 000	21 000	33 500	34 000
Innovation Fund	113 320	125 846	136 425	161 450	171 313	186 597	198 493
National Laser Centre	-	-	5 000	11 540	18 000	18 000	19 080
Indicators	-	-	-	2 000	-	500	1 120
Equipment Placement	-	-	-	-	-	20 000	20 000
National Energy Research Institute	-	-	-	-	10 000	20 000	40 000
South African Aids Vaccine Initiative	-	-	-	-	15 000	20 000	15 000
Science Missions and Human Capital							
National Research Foundation	283 653	330 770	357 921	392 036	446 288	482 041	517 224
Public Science and Youth	4 702	6 644	10 829	8 046	11 000	20 000	20 000
Foundation for Education, Science and Technology Grant-in-aid	7 597	8 564	-	-	-	-	-
	-	-	12 501	5 486	5 899	6 327	6 157
Centres of Excellence	-	-	-	15 000	-	5 000	6 200
Science Themes	3 500	3 500	3 500	23 500	25 681	24 750	50 583
Capital	**1 353**	**2 323**	**26 388**	**12 203**	**4 000**	**4 240**	**4 500**
Science Missions and Human Capital							
Grant-in-aid	-	-	10 000	-	-	-	-
Centres of Excellence	-	-	6 700	-	-	-	-
National Research Foundation	1 353	2 323	9 688	12 203	4 000	4 240	4 500
Total	**414 128**	**477 651**	**594 428**	**758 251**	**872 224**	**1 043 000**	**1 141 191**

Expenditure trends

The funding for *Science and Technology for Competitiveness* expanded sharply in the 2003/04 financial year with the first allocation for implementing the National Research and Development Strategy. After an annual average growth of 22,9 per cent over the period 2000/01 to 2003/04, the allocation is projected to nearly double from R608,2 million in 2002/03 to above R1,0 billion in 2005/06. The 2004 medium term estimates include funds for the establishment of the National Energy Research Institute (R10,0 million, R20,0 million and R40,0 million).

An increased allocation of funds towards implementing the National Research and Development Strategy has enabled an appreciable development of the four technology missions in this programme. Although the biotechnology mission still enjoys priority within the National Biotechnology Strategy, the development of the other missions is on track.

Additional funding strengthens activities in terms of the National Biotechnology Strategy and allows for the launching of technology missions for ICT, natural resources and advanced manufacturing. It also allows for the funding of a range of centres of excellence in research and teaching, mainly through the National Research Foundation.

The Innovation Fund is projected to grow by 7,0 per cent per year over the medium term. The fund has succeeded in broadening its instruments by reprioritising the financing of science themes to service the crucial gender and disability portfolio, which developed strongly in 2003.

Service delivery objectives and indicators

Recent outputs

A reference group to address the inadequate involvement of women in science and technology was established in February 2003 to improve women's participation in science and technology, from their early subject choices in schools to the career obstacles they face in the scientific community.

The Advanced Manufacturing Technology Strategy was launched in October 2003 and resources are being allocated towards its implementation. Planning is under way for developing innovation programmes in the energy and mining and mineral beneficiation domains of the resource-based industries mission.

The department initiated specific projects to further the successes of the innovation strategy and the significant impact on science and technology:

- The South African HIV and Aids Vaccine Initiative (SAAVI), led by the Medical Research Council, is aimed at developing a vaccine to combat HIV and Aids. Major advances in the project include the development of a vaccine candidate for clinical trials that started in 2003.
- Support for developing Southern Africa as a region of excellence in space science and astronomy has yielded significant benefits. The construction of the largest optical/infrared telescope in the southern hemisphere (the South African Large Telescope at Sutherland in the Northern Cape) and the largest gamma ray telescope in the world (the High Energy Stereoscopic System in Namibia) are nearly complete, and strengthen the region's contribution to skills development and knowledge-generation in these fields. Work has begun to attract the Square Kilometre Array Programme to the country and good progress has been made.

With respect to activities to support human capital development, specific projects include: the launch of the African Institute for Mathematics, a centre of excellence aimed at high level mathematical training; a centre of excellence in mathematical modelling of infectious diseases which was launched in December 2003; and the centres of excellence plan implemented by the NRF. The initial phase of assessment of pre-proposals for the national centres of excellence, with a focus on research and capacity-building, has been completed and their establishment is on track to commence in April 2004.

Medium-term output targets

Science and Technology for Competitiveness

Measurable objectives:

Establish and leverage enhanced innovation through the technology missions identified in the National Research and Development Strategy as measured by innovation surveys.

Establish and grow national scientific programmes to fund human capital programmes to ensure sufficient and growing science, engineering and technology human resources for economic growth as measured by widely accepted indicators.

Subprogramme	Output	Measure/Indicator	Target
Technology Missions	Establishment of the following technology missions: manufacturing, ICT, and resource-based industries mission	Number and range of missions and innovation activities	Continued operation of the three Biotechnology Regional Innovation Centres (BRICS) with greater emphasis on innovation outcomes March 2005 The National Bio-Informatics Network programme expands in March 2005 The National Plant Biotechnology Innovation Centre operational in December 2004, with focus on food security and critical economic plant resources Implementation of the National Nanotechnology programme in February 2005

Subprogramme	Output	Measure/Indicator	Target
			Consolidation of efforts for implementation of the Open Source Software Programme in January 2005 with national and international parties
			The National Energy Research Institute established in February 2005
			National energy R&D strategy planning finalised in March 2005
	Increased innovation capacity in the National System of Innovation	New Innovation Fund instruments in place	Intellectual property from public research policy developed and implemented in February 2005
	Improved provincial engagement with the National Research and Development Strategy (NRDS)	Support provided for provincial innovation initiatives	One initiative per province supported by March 2005
Science Missions and Human Capital	Science, engineering and technology (SET) human resources	Increased quality and numbers of matric exemptions in maths and science	Strategic planning in place for out of school programmes by December 2004
	Quality science and engineering graduates in higher education sector	Improved representivity of the SET workforce	Programmes implemented to increase the number and quality of graduates
	Establishment and funding of centres of excellence	First phase (competitive call) finalised and centres established	Centres established or funded by September 2006
		Increased numbers of researchers (academics and postgraduate students) involved in science themes identified in the NRDS	Antarctic research plan adopted and funding secured
		Institutional framework for support of science and art centre activities	Astronomy and palaeontology research and capacity-building frameworks finalised in June 2004
		African networks of excellence	Arts and science centre policy adopted, and implementation to begin in December 2004
			Framework for implementation and funding for South Africa nodes finalised in December 2004

Entities and instruments represented in the Science vote

The Science vote is the government allocation to public entities (referred to as the science councils) and to the Innovation Fund. While the councils report to different ministries, allocations are considered in an integrated way. The allocation of the Science vote process begins with the National Treasury's Budget guidelines. Science councils then interact with their line ministers on sector-specific and national development priorities, and make three-year budget submissions. From these, the Department of Science and Technology co-ordinates a consolidated Science vote submission to Treasury. The resulting government allocation for the vote is then distributed between some of the science councils, in line with advice from the National Council on Innovation and the Department of Science and Technology, and included in the MTEF allocations of the departments. The current distribution of the Science vote is reflected in Table 18.14.

Council for Scientific and Industrial Research

The Council for Scientific and Industrial Research (CSIR) is governed by the Scientific Research Council Act (46 of 1988), as amended by Act 71 of 1990. It reports to the Minister of Trade and Industry. The CSIR's mandate is to foster industrial and scientific development – either by itself or in partnership with public and private sector institutions – to contribute to the improvement of the quality of life of the people of South Africa. This must, in terms of the legislation, be done in the national interest through directed and multidisciplinary research and technological innovation. Building on past successes, the CSIR will continue to use its research skills innovatively in the transformation of the country. Co-operation between the science councils is important for finding holistic solutions.

Medical Research Council

The Medical Research Council (MRC), reporting to the Minister of Health, was established by the South African Medical Research Council Act (19 of 1969) (replaced by Act 58 of 1991) as an independent statutory body to co-ordinate health and medical research activities throughout South Africa. The council's mission is to improve the nation's health status and quality of life through health research aimed at promoting equity and development. Recently the council placed an even greater emphasis on values and ethics in line with the broader South African value system and current needs in the health research environment. The MRC's HIV and Aids vaccine project, in particular, will test the organisation in the application of these values and ethics.

Agricultural Research Council

The Agricultural Research Council (ARC), reporting to the Minister of Agriculture, was officially founded on 1 April 1992, but some of its major research components date back a hundred years. Since 1992, the ARC has accumulated significant knowledge and a considerable number of biotechnologies which have enabled it to provide key support to food and other agricultural production, for consumption at home and for export. The ARC is continuing to provide South Africa with world class, research-based knowledge and systems to support decisions on the use and maintenance of natural resources.

The Council for Geoscience

The Council for Geoscience (CGS) operates in terms of the Geoscience Act (100 of 1993). It reports to the Minister of Minerals and Energy. The organisation provides geoscience information and services for the benefit of the people of South Africa. The council facilitates the exploitation of South Africa's minerals, and runs a number of services to aid this function, for example: a CD-ROM database and map for South African mineral deposits and occurrences, and a programme to identify targets for mineral development in the poorest areas of South Africa with a view to combating poverty. The Council for Geoscience is internationally engaged and has succeeded in winning new tenders, which are funded by the World Bank, the Islamic Development Bank, the African Development Bank and the Nordic Development Fund.

South African Bureau of Standards

The South African Bureau of Standards (SABS) operates in terms of the Standards Act (29 of 1993) and reports to the Minister of Trade and Industry. The SABS seeks to improve the competitiveness of the South African economy and to make a contribution to the quality of life of all South Africans. Its core business is to produce, maintain and disseminate standards. The SABS has registered increases in both the number of standards published and the number of published pages over the past year. It is developing a standard for the detection of cholera bacteria in water

and standards for railway safety. Its global trade continues to grow three to four times faster than the country's international trade as a whole.

Council for Minerals and Technology

The Council for Minerals and Technology (Mintek) reports to the Minister of Minerals and Energy and operates in terms of the Mineral Technology Act (30 of 1989). Mintek serves South Africa by promoting technology, industrial growth and human development. Mintek is involved in developing the sub-continental (SADC) and continental (African) minerals industry, particularly the minerals R&D capacity. It was involved in developing the economic growth strategy for the Millennium African Partnership, which has now evolved into NEPAD. Mintek also runs black economic empowerment projects through outsourcing programmes. Over 300 matric students were on the Mintek-initiated Edumap programme across the country, including 70 at the Edumap Wits College. Mintek also runs a very successful in-house programme for about 35 technikon students each year, who complete their training at Mintek.

Public entities reporting to the Minister

Human Sciences Research Council

The Human Sciences Research Council (HSRC) promotes research and knowledge in the field of the human sciences in terms of the Human Sciences Research Act (23 of 1968). The HSRC has recently made a fundamental shift in its strategic orientation and programmes, which has resulted in strong growth and further projected growth in contract and consortium earnings. The HSRC is sensitive to the need to reach disadvantaged communities which cannot afford market rates for services. Focal areas include human resource development, the social aspects of HIV and Aids and health, an integrated approach to development, and the labour market and job creation.

National Research Foundation

The National Research Foundation (NRF) promotes research (both basic and applied) knowledge in science, technology and indigenous technology, in terms of the National Research Foundation Act (23 of 1998). It operates national facilities that undertake public research, train students and develop key competencies in the national interest. The national facilities under the foundation are: Hartebeesthoek Radio Astronomy Observatory; Hermanus Magnetic Observatory; South African Environmental Observatory Network; South African Institute for Aquatic Biodiversity and iThemba Laboratory for Accelerator Based Sciences. It will also take responsibility for the National Zoological Gardens that will be transferred to the Department of Science and Technology with effect from 1 April 2004.

Innovation Fund

The National Research Foundation is responsible for managing and co-ordinating the activities of the Innovation Fund. The board of the Innovation Fund has recently reviewed the criteria for granting funds to consortia. Two funding streams have been created, namely the open-call Technology Advancement Programme (TAP) and the Missions in Technology (MiTech). The current cycle of TAP funding supports three-year projects that propose to utilise advanced technologies such as ICT, new materials and product technologies, and cleaner production technologies. The purpose of MiTech is to support the accelerated development of high risk, market-driven enabling technologies in all economic sectors, in partnership with industry. The current cycle of MiTech funding supports projects that propose to utilise advanced technologies, in various industries. The technology missions are usually funded over a five-year period.

Africa Institute of South Africa

The Africa Institute of South Africa is a statutory council that carries out in-depth analysis of Africa's current affairs, gathers intelligence on issues related to the future of the continent, the African Union and NEPAD, and change in general. The strong increase in funding is based on the revised mandate to develop research capabilities.

National Laser Centre

The National Laser Centre manages laser equipment and expertise used for R&D. The current focus is mainly on developing laser-based technology to improve the competitiveness of South African industry, and on the transfer of knowledge and technology to industry. The centre provides universities and technikons with access to laser equipment and expertise to stimulate the development of a laser-based research culture.

Godisa Trust

Godisa operates the Department of Science and Technology's innovation and technology demonstration activities and incubator programme, initiated with EU financing and now co-financed with funding streams from the Department of Trade and Industry, the Department of Science and Technology and the EU. The trust operates these initiatives under a management agreement with the Department of Trade and Industry and the Department of Science and Technology.

Tshumisano Trust

Tshumisano operates the technology stations programme with funding from the Department of Science and Technology and technical assistance and capacity-building from a German development agency, Gesellschaft fur Technische Zusamenarbeit (GTZ). Technology stations are developed at technikon, and service SMMEs and build market responsiveness in the programmes of the technikons.

Academy of Science of South Africa

The Academy of Science of South Africa Act (67 of 2001) provides for the establishment of the Academy. The academy's roles include publishing scientific reports, promoting excellence in scientific and technical practices, investigating matters of public interest concerning science, and managing South African research journals.

National Energy Research Institute

The National Energy Research Institute will be established in 2004. The funding of energy research forms part of the Science vote and has two components. It consists firstly of agency financing to fund research at universities and relevant science councils in order to create and strengthen centres of excellence and research capacity. The second component is to establish and operate the National Energy and Research Institute.

Annexure

Vote 18: Science and Technology

Table 18.8: Summary of expenditure trends and estimates per programme

Table 18.9: Summary of expenditure trends and estimates per economic classification

Table 18.10: Summary of personnel numbers and compensation of employees

Table 18.11: Summary of expenditure on training

Table 18.12: Summary of information and communication technology expenditure

Table 18.13: Summary of official development assistance expenditure

Table 18.14: Summary of expenditure estimates by science council

Table 18.8: Summary of expenditure trends and estimates per programme

	Expenditure outcome							Medium-term expenditure estimate		
	Audited	Audited	Preliminary outcome	Main appropriation	Additional appropriation	Adjusted appropriation	Revised estimate			
R thousand	2000/01	2001/02	2002/03		2003/04			2004/05	2005/06	2006/07
1 Administration	18 279	23 227	37 421	30 803	–	30 803	55 328	60 921	65 522	71 212
2 Technology for Development	130 482	174 423	112 945	196 937	7 847	204 784	198 384	264 297	298 686	320 908
3 International Co-operation and Resources	12 180	15 235	30 512	42 714	1 228	43 942	40 427	46 186	75 123	81 993
4 Government Science and Technology System	5 244	7 663	12 855	14 948	200	15 148	13 937	16 197	16 460	17 457
5 Science and Technology for Competitiveness	416 601	480 947	608 168	775 599	(2 005)	773 594	760 195	888 611	1 059 702	1 159 557
Total	**582 786**	**701 495**	**801 901**	**1 061 001**	**7 270**	**1 068 271**	**1 068 271**	**1 276 212**	**1 515 493**	**1 651 127**
Change to 2003 Budget Estimate						37 746	37 746	122 802	151 510	

Table 18.9: Summary of expenditure trends and estimates per economic classification

	Expenditure outcome							Medium-term expenditure estimate		
	Audited	Audited	Preliminary outcome	Main appropriation	Additional appropriation	Adjusted appropriation	Revised estimate			
R thousand	2000/01	2001/02	2002/03		2003/04			2004/05	2005/06	2006/07
Current payments										
Compensation of employees	**18 906**	**25 507**	**31 756**	**62 162**	**(10 000)**	**52 162**	**50 167**	**66 461**	**70 196**	**74 405**
- Salaries and wages	17 363	23 428	29 169	57 132	(10 000)	47 132	45 137	61 054	64 465	68 333
- Social contributions	1 543	2 079	2 587	5 030	–	5 030	5 030	5 407	5 731	6 072
Goods and services	**14 361**	**16 617**	**46 110**	**13 722**	**12 900**	**26 622**	**48 182**	**42 774**	**44 876**	**50 131**
Interest and rent on land	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
- Interest	–	–	–	–	–	–	–	–	–	–
- Rent on land	–	–	–	–	–	–	–	–	–	–
Financial transactions in assets and liabilities	**–**	**–**	**7**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Unauthorised expenditure	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Total current payments	**33 267**	**42 124**	**77 873**	**75 884**	**2 900**	**78 784**	**98 349**	**109 235**	**115 072**	**124 536**
Transfers and subsidies to:										
Provinces and municipalities	**63**	**85**	**106**	**205**	**–**	**205**	**205**	**220**	**232**	**247**
- Provinces	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
- Provincial Revenue Funds	–	–	–	–	–	–	–	–	–	–
- Provincial agencies and funds	–	–	–	–	–	–	–	–	–	–
- Municipalities	**63**	**85**	**106**	**205**	**–**	**205**	**205**	**220**	**232**	**247**
- Municipalities	63	85	106	205	–	205	205	220	232	247
- Municipal agencies and funds	–	–	–	–	–	–	–	–	–	–
Departmental agencies and accounts	**548 516**	**655 459**	**719 621**	**984 048**	**3 270**	**987 318**	**967 753**	**1 161 742**	**1 394 322**	**1 519 424**
- Social security funds	–	–	–	–	–	–	–	–	–	–
- Departmental agencies (non-business entities)	548 516	655 459	719 621	984 048	3 270	987 318	967 753	1 161 742	1 394 322	1 519 424

Table 18.9: Summary of expenditure trends and estimates per economic classification (continued)

	Expenditure outcome							Medium-term expenditure estimate		
	Audited	Audited	Preliminary outcome	Main appropriation	Additional appropriation	Adjusted appropriation	Revised estimate			
R thousand	2000/01	2001/02	2002/03		2003/04			2004/05	2005/06	2006/07
Universities and technikons	–	–	–	–	–	–	–	–	–	–
Foreign governments & international organisations	–	–	–	–	–	–	–	–	–	–
Public corporations and private enterprises	–	–	–	–	–	–	–	–	–	–
- Public corporations	–	–	–	–	–	–	–	–	–	–
- Subsidies on production	–	–	–	–	–	–	–	–	–	–
- Other transfers	–	–	–	–	–	–	–	–	–	–
- Private enterprises	–	–	–	–	–	–	–	–	–	–
- Subsidies on production	–	–	–	–	–	–	–	–	–	–
- Other transfers	–	–	–	–	–	–	–	–	–	–
Non-profit institutions	–	–	–	–	–	–	–	–	–	–
Households	–	–	–	–	–	–	–	**4 000**	**5 000**	**6 000**
- Social benefits	–	–	–	–	–	–	–	–	–	–
- Other transfers to households	–	–	–	–	–	–	–	4 000	5 000	6 000
Total transfers and subsidies	**548 579**	**655 544**	**719 727**	**984 253**	**3 270**	**987 523**	**967 958**	**1 165 962**	**1 399 554**	**1 525 671**
Payments on capital assets										
Buildings and other fixed structures	–	–	–	–	–	–	–	–	–	–
- Buildings	–	–	–	–	–	–	–	–	–	–
- Other fixed structures	–	–	–	–	–	–	–	–	–	–
Machinery and equipment	**940**	**3 827**	**4 301**	**864**	**1 100**	**1 964**	**1 964**	**1 015**	**867**	**920**
- Transport equipment	–	–	–	–	–	–	–	–	–	–
- Other machinery and equipment	940	3 827	4 301	864	1 100	1 964	1 964	1 015	867	920

Table 18.9: Summary of expenditure trends and estimates per economic classification (continued)

	Expenditure outcome							Medium-term expenditure estimate		
	Audited	Audited	Preliminary outcome	Main appropriation	Additional appropriation	Adjusted appropriation	Revised estimate			
R thousand	2000/01	2001/02	2002/03		2003/04			2004/05	2005/06	2006/07
Cultivated assets	–	–	–	–	–	–	–	–	–	–
Software and other intangible assets	–	–	–	–	–	–	–	–	–	–
Land and subsoil assets	–	–	–	–	–	–	–	–	–	–
Of which: Capitalised compensation	–	–	–	–	–	–	–	–	–	–
Total payments on capital assets	**940**	**3 827**	**4 301**	**864**	**1 100**	**1 964**	**1 964**	**1 015**	**867**	**920**
Total	**582 786**	**701 495**	**801 901**	**1 061 001**	**7 270**	**1 068 271**	**1 068 271**	**1 276 212**	**1 515 493**	**1 651 127**

Table 18.10: Summary of personnel numbers and compensation of employees[1]

Personnel numbers	**2000/01**	**2001/02**	**2002/03**	**2003/04**	**2004/05**
1 Administration	74	106	147	118	126
2 Technology for Development	4	6	14	39	47
3 International Co-operation and Resources	9	11	28	42	53
4 Government Science and Technology System	25	36	52	55	56
5 Science and Technology for Competitiveness	4	5	13	53	52
Total	**116**	**164**	**254**	**307**	**334**
Total compensation of employees (R thousand)	18 906	25 507	31 756	52 162	66 461
Unit cost (R thousand)	163.0	155.5	125.0	169.9	199.0

1 Full-time equivalent

Table 18.11: Summary of expenditure on training

	Expenditure outcome				Medium-term expenditure estimate		
	Audited	Audited	Preliminary outcome	Adjusted appropriation			
R thousand	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07
1 Administration	22	67	102	115	913	945	1 036
2 Technology for Development	3	11	15	38	91	96	102
3 International Co-operation and Resources	7	19	30	41	104	110	116
4 Government Science and Technology System	9	25	38	54	108	114	120
5 Science and Technology for Competitiveness	4	8	15	52	130	137	145
Total	**45**	**130**	**200**	**300**	**1 346**	**1 402**	**1 519**

Table 18.12: Summary of information and communications technology expenditure

	Expenditure outcome				Medium-term expenditure estimate		
	Audited	Audited	Preliminary outcome	Adjusted appropriation			
R thousand	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07
1 Administration	**–**	**748**	**634**	**784**	**1 638**	**1 670**	**1 475**
Technology	–	658	634	684	738	738	500
IT services	–	90	–	100	900	932	975
2 Technology for Development	**–**	**254**	**393**	**524**	**457**	**457**	**450**
Technology	–	254	393	424	457	457	450
IT services	–	–	–	100	–	–	–
3 International Co-operation and Resources	**–**	**402**	**623**	**772**	**705**	**705**	**700**
Technology	–	402	623	672	705	705	700
IT services	–	–	–	100	–	–	–
4 Government Science and Technology System	**–**	**438**	**682**	**836**	**772**	**772**	**400**
Technology	–	438	682	736	772	772	400
IT services	–	–	–	100	–	–	–

Table 18.12: Summary of information and communications technology expenditure (continued)

	Expenditure outcome				Medium-term expenditure estimate		
R thousand	Audited 2000/01	Audited 2001/02	Preliminary outcome 2002/03	Adjusted appropriation 2003/04	2004/05	2005/06	2006/07
5 Science and Technology for Competitiveness	**–**	**161**	**248**	**367**	**280**	**280**	**350**
Technology	–	161	248	267	280	280	350
IT services	–	–	–	100	–	–	–
Total	**–**	**2 003**	**2 580**	**3 283**	**3 852**	**3 884**	**3 375**

Table 18.13: Summary of official development assistance expenditure

Donor	Programme / project name	Cash or	Expenditure outcome				Medium-term expenditure estimate		
R thousand		kind	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07
			-	-	-	-	-	-	-
European Union	GODISA programme support SMMEs		-	4 044	16 091	18 580	-	-	-
Total			**–**	**4 044**	**16 091**	**18 580**	**–**	**–**	**–**

Table 18.14: Summary of expenditure estimates by science council

Council	Department	Expenditure outcome				Medium-term expenditure estimate		
		Audited	Audited	Preliminary outcome	Adjusted appropriation			
R thousand		2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07
Council for Scientific and Industrial Research (CSIR)	Trade and Industry	301 112	302 877	297 751	323 014	348 326	372 151	400 240
South African Bureau of Standards (SABS)	Trade and Industry	79 052	81 369	85 000	91 407	98 099	104 991	114 170
Council for Mineral Technologies (MINTEK)	Minerals and Energy	78 007	76 872	76 410	82 439	88 632	95 019	103 600
Council for Geosciences (CGS)	Minerals and Energy	60 856	65 946	66 384	72 019	77 606	84 375	91 257
Agricultural Research Council (ARC)	Agriculture	268 378	262 746	266 552	289 013	347 742	373 838	405 439
Medical Research Council	Health	108 661	127 221	145 498	156 695	154 388	164 304	188 703
Human Sciences Research Council (HSRC)	Science and Technology	61 452	65 492	65 087	70 030	82 836	88 107	100 566
National Research Foundation (NRF)	Science and Technology	272 844	318 479	344 696	377 263	430 276	485 078	519 243
Africa Institute of South Africa (AISA)	Science and Technology	7 351	8 178	8 981	11 713	16 325	17 960	20 857
Total		**1 237 713**	**1 309 180**	**1 356 359**	**1 473 593**	**1 644 230**	**1 785 823**	**1 944 075**