

Vote 31

Science and Technology

R thousand	2007/08 To be appropriated	2008/09	2009/10
MTEF allocations			
Administration	85 322	90 025	97 138
Research, Development and Innovation	546 551	788 800	1 026 467
International Co-operation and Resources	118 016	144 953	157 701
Human Capital and Knowledge Systems	1 257 329	1 422 408	1 571 233
Socio-Economic Partnerships	1 135 261	1 193 311	1 235 822
Total	3 142 479	3 639 497	4 088 361
Direct charges against the National Revenue Fund	–	–	–
Total expenditure estimates	3 142 479	3 639 497	4 088 361
Economic classification			
Current payments	222 226	256 958	284 196
Transfers and subsidies	2 917 799	3 380 159	3 801 644
Payments for capital assets	2 454	2 380	2 521
Total expenditure estimates	3 142 479	3 639 497	4 088 361
Executive authority	Minister of Science and Technology		
Accounting officer	Director-General 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 purposes

Programme 1: Administration

Conduct the overall management of the department and provide centralised support services. Ensure that funded organisations comply with good corporate governance practices and are aligned with the strategic focus of the national system of innovation. Monitor and evaluate the science councils.

Programme 2: Research, Development and Innovation

Provide leadership in longer term and cross-cutting research and innovation in the national system of innovation, playing a key role in supporting all new areas of research and innovation in South Africa.

Programme 3: International Co-operation and Resources

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.

Programme 4: Human Capital and Knowledge Systems

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

Programme 5: Socio-Economic Partnerships

Lead and support other government departments in sector specific research and development, technology, and directed human capital programmes.

Strategic overview: 2003/04 – 2009/10

Despite national interventions in science and technology policy since 2004, the recorded in-flows of technology intensive products and services from international sources in 2005/06 suggest that South Africa still does not have the required human capital and infrastructure to sustain a knowledge based economy. The department's primary focus is on implementing the national research and development strategy, which provides for: an integrated approach to human resource development; knowledge generation; investment in infrastructure; and improving the strategic management of the public science and technology system. The revised strategic management model for the science and technology system gives the department the role of developing emerging and rapidly changing areas of science and technology and co-ordinating and providing support to sector specific science and technology activities led by other government departments.

The department has reorganised itself and its programme structure and is now poised to respond effectively and strategically to the key elements of the national research and development strategy.

Research, development and innovation

The development of the two frontier technology areas, biotechnology and space technologies, received significant budgetary funding. Major biotechnology innovations that are being championed by the biotechnology regional innovation centres (BRICs), a key vehicle for rolling out the biotechnology strategy, include: bioengineering processes to successfully treat polluted mine wastewater; the Biovac vaccine development initiative to address national health risks; and the development of the micro-array facility, which provides services in gene data analysis and interpretation. The work of the biotechnology research and innovation platform has also received support from increased public understanding of biotechnology initiatives.

The Innovation Fund is actively stimulating the South African innovation base with outputs like the Geratech Zirconium plant and the commercialisation of cost effective bio-ceramic orbital eye implant technology.

The launch of the Southern African Large Telescope (SALT), the most powerful optical telescope in the southern hemisphere, and the high energy stereoscopic system (HESS), the most powerful gamma ray telescope in the world, are both groundbreaking developments in South Africa. The recently initiated Karoo Array Telescope (KAT), a radio telescope that will demonstrate South Africa's engineering competence, will improve South Africa's profile in its bid to host the Square Kilometre Array (SKA) radio telescope, an international project to build the largest radio telescope in the world, which will consist of an array of satellite dishes spread over one square kilometer. The development of the astronomy geographical advantage programme (AGAP) is also firmly on track. The aim of AGAP is to develop and implement mechanisms that promote South Africa's strategic and geographical advantages in all areas of astronomy. AGAP will steer the integration of astronomy initiatives under the broad heading of research, human capital development and funding.

To be a successful global research player, the department has initiated the South African national research network (SANReN). Implementation begins with the provision of between 0,5 and 1 gigabytes per second connectivity to priority research sites in South Africa. Over time, more than 45 research sites will be connected to the network, international connectivity will be strengthened, and more bandwidth will be available.

Human resources development and knowledge systems

Developing human capital for the national system of innovation is central to implementing the national research and development strategy. Flagship programmes in this area include the South African research chair initiative, the centres of excellence, the post-doctoral fellowship and professional development programmes, and the youth into science strategy. A science, engineering and technology human capital strategy is being developed to co-ordinate these and other programmes.

The implementation of the national nanotechnology strategy is focused on creating concentrated critical mass in specific areas. The nanoscience and technology research agenda is supported by the rollout of the equipment programme.

International co-operation and resources

There is a rapid increase in bilateral and multilateral activity linking South Africa with science and technology systems internationally, with the relationship with the European Union in particular strengthened in the past two years. As the first chair of the New Partnership for Africa's Development (NEPAD) African Ministerial Council on Science and Technology, South Africa drove the developmental programme of a continent wide plan of action for the development of science and technology in Africa. The contribution of foreign funding to research and development in South Africa has grown from close to zero in 1994 to over 10 per cent in 2003/04 as measured in the national research and development survey. Winning the bid to host the third component centre of the 60 country International Centre for Genetic Engineering and Biotechnology has made South Africa significantly more attractive for science and technology investment.

Socio-economic impact

Recognising that science and technology advancements can promote economic growth and increase access to the formal economy, the department will focus on providing guidance in strategically important sectors such as aquaculture and advanced manufacturing.

Promising developments include public-private partnership investigative work supported by the department for commercial scale abalone farming in Hondeklip Bay and the co-operation with other departments, such as water affairs and forestry and agriculture, in investigating the potential for using state owned irrigation dams for new black owned aquaculture businesses.

The advanced manufacturing technology strategy is aimed at strengthening the competitiveness of the manufacturing sector through targeted high impact research and experimental development projects. The department has secured industry support in the aerospace and automotive sectors. Examples include an agreement with Airbus, aimed at strengthening integration with global manufacturing supply chains and developing local human capital through work exchange opportunities and collaborating in aeronautics research and development.

Investment in science and technology

The former science vote has been replaced with a new planning mechanism allowing departments to report on their spending on science and technology activities in this publication. National expenditure on research and development has increased from 0,8 per cent of GDP in 2003/04 to 0,9 per cent in 2004/05. It is anticipated that the 2005/06 national research and development survey will show further improvement in meeting the target of 1 per cent by 2008/09. The survey is accredited by the Organisation for Economic Co-operation and Development and is declared official statistics in terms of the Statistics Act (1999). In 2006/07, the tax rebate for research and development expenditure was increased from 100 per cent to 150 per cent, and a more favourable regime for the depreciation of research and development capital expenditure was created, namely 50:30:20. The aim is to encourage the private sector to do more research and development.

Expenditure estimates

Table 31.1 Science and Technology

Programme	Audited outcome			Adjusted appropriation	Revised estimate	Medium-term expenditure estimate		
	2003/04	2004/05	2005/06	2006/07		2007/08	2008/09	2009/10
R thousand								
1. Administration	57 872	62 558	99 641	212 211	217 211	85 322	90 025	97 138
2. Research, Development and Innovation	300 078	333 499	341 218	405 654	405 654	546 551	788 800	1 026 467
3. International Co-operation and Resources	40 508	46 170	77 635	127 946	122 946	118 016	144 953	157 701
4. Human Capital and Knowledge Systems	448 789	521 118	639 021	863 442	863 442	1 257 329	1 422 408	1 571 233
5. Socio-Economic Partnerships	544 335	669 532	883 757	1 007 840	1 007 840	1 135 261	1 193 311	1 235 822
Total	1 391 582	1 632 877	2 041 272	2 617 093	2 617 093	3 142 479	3 639 497	4 088 361
Change to 2006 Budget estimate				3 000	3 000	234 000	389 000	
Economic classification								
Current payments	105 573	127 140	173 497	204 861	203 061	222 226	256 958	284 196
Compensation of employees	45 710	58 205	65 125	86 957	86 957	112 964	119 047	126 530
Goods and services	59 863	68 727	108 343	117 904	116 104	109 262	137 911	157 666
<i>of which:</i>								
Communication	4 049	4 460	4 700	6 660	6 660	7 471	9 391	9 940
Computer services	2 817	2 965	3 281	2 071	2 071	5 677	6 562	6 951
Consultants, contractors and special services	12 144	12 867	42 306	28 662	28 662	33 424	44 301	48 616
Inventory	5 908	6 219	4 180	5 615	5 615	3 738	3 925	4 160
Maintenance, repairs and running costs	153	160	108	185	185	700	865	914
Operating leases	2 465	5 108	3 626	3 137	3 137	1 491	1 711	1 814
Travel and subsistence	15 613	15 346	24 878	27 368	27 368	26 615	33 445	40 980
Financial transactions in assets and liabilities	–	208	29	–	–	–	–	–
Transfers and subsidies	1 282 827	1 497 448	1 865 086	2 268 551	2 268 551	2 917 799	3 380 159	3 801 644
Provinces and municipalities	139	6 732	193	63	64	–	–	–
Departmental agencies and accounts	748 769	712 761	808 500	1 256 874	1 259 374	1 624 885	1 745 246	1 852 002
Universities and technikons	–	16 289	32 274	12 667	29 667	10 000	10 000	20 000
Public corporations and private enterprises	334 554	489 201	596 962	505 798	585 798	517 352	544 749	571 487
Foreign governments and international organisations	–	11	–	–	–	–	–	–
Non-profit institutions	199 365	263 526	425 816	492 545	392 644	765 562	1 080 164	1 358 155
Households	–	8 928	1 341	604	1 004	–	–	–
Payments for capital assets	3 182	8 289	2 689	143 681	145 481	2 454	2 380	2 521
Buildings and other fixed structures	–	–	–	133 000	133 000	–	–	–
Machinery and equipment	3 182	8 289	2 689	10 681	12 481	2 454	2 380	2 521
Total	1 391 582	1 632 877	2 041 272	2 617 093	2 617 093	3 142 479	3 639 497	4 088 361

Expenditure trends

Expenditure is expected to continue to increase rapidly, rising from R1,4 billion in 2003/04 to an expected R4,1 billion in 2009/10, an average annual increase of 20 per cent. Most of this expenditure is made up of transfers to public entities for science and technology initiatives.

Additional allocations of R1,2 billion over the MTEF period are for programmes that support the implementation of various departmental strategic initiatives: strategic research and development (R120 million); the science, engineering and technology human capital development strategy (R323 million); science and technology policy planning, monitoring and evaluation (R65 million); and science and technology core research and development infrastructure (R178 million). R43 million is for further VAT adjustments to entities reporting to the department.

The *Research, Development and Innovation* programme will receive an additional allocation of R500 million for the bid for the Square Kilometre Array (SKA) project.

Infrastructure spending

Infrastructure plays a critical role in the national system of innovation by providing facilities for teaching and research and development. An additional allocation of R60 million over the MTEF period will be used to acquire or upgrade instrumentation for national research institutions and provide infrastructure for research capacity development.

The National Advisory Council on Innovation and the Department of Science and Technology have produced a comprehensive report on the infrastructure requirements for both science and innovation, which will form the basis of a long-term infrastructure plan for science and technology.

The speed with which research results are obtained is a critical competitive factor in the research, development and innovation enterprise. The Centre for High Performance Computing enables data intensive research, such as modelling and simulation and bioinformatics, to be conducted in South Africa at competitive rates, and receives R22 million over the MTEF period. SANReN will result in a faster exchange of research data and information among researchers in South Africa and between local researchers and their international counterparts, and will receive R95 million over the MTEF period.

An additional allocation of R500 million over the MTEF period will allow South Africa to participate in the bid for the Square Kilometre Array (SKA) project and build the Karoo Array Telescope (KAT), which will in turn provide opportunities to train scientists and engineers to acquire relevant capabilities and skills.

Based on identified focus areas in the hydrogen economy strategy, envisaged infrastructure will include equipment for catalysis research, testing instruments, and specialised equipment to test appropriate materials for the construction of hydrogen storage and distribution systems. R93 million has been allocated over the MTEF period for this.

Due to a lack of office space at its old leased building in central Pretoria and the growing number of staff, in May 2006 the department relocated to its new building on the Council for Scientific and Industrial Research (CSIR) campus.

Science and technology activities

The new governance framework for science and technology sets out key elements for ensuring 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 is busy setting up a comprehensive database to monitor research and development activities. A review of how departments use funding for science and manage science and technology activities was initiated and will be compiled into the national science and technology expenditure report.

Science and technology activities comprise systematic activities linked to generating, advancing, disseminating and applying science and technology knowledge in all fields of science and technology. These include activities like:

Scientific and technical education and training (STET) covers all activities comprising specialised non-university higher education and training, higher education and training leading to a university degree, postgraduate and further training, and organised lifelong training for scientists and engineers.

Scientific and technological innovation (STI) is the transformation of an idea into a new or improved product, a new or improved operational process, or a new approach to a social service.

Science and technology services (STS) are activities that support research and experimental development and contribute to the generation, dissemination and application of scientific and technical knowledge, including patenting, geological surveys, standards generation, operation of libraries and national scientific databases.

The department's science and technology activities are listed in the table below. The department's appropriations to science and technology activities are guided by the 2002 national research and development strategy and new technology development and human capital programmes. The department's focus and primary responsibility is on cross-cutting and cutting edge science and technology activities.

Summary of expenditure on science and technology activities funded by the Department of Science and Technology

	2006/07	2007/08	2008/09	2009/10
R thousand				
STS	405 777	614 828	571 338	599 988
STET	24 482	35 300	49 828	61 548
STI	1 830 266	2 279 254	2 781 818	3 159 576
Total STAs	2 260 525	2 929 382	3 402 984	3 821 112

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

	2006/07	2007/08	2008/09	2009/10
R thousand				
National Advisory Council on Innovation (NACI)	9 132	9 757	10 351	11 949
Academy of Science of South Africa (ASSAf)	3 000	3 400	3 820	4 003
Africa Institute of South Africa (AISA)	28 879	26 530	27 830	27 122
Human Science Research Council (HSRC)	119 873	155 949	160 706	157 858
National Research Foundation (NRF)	586 671	648 394	680 832	680 396
Council for Scientific and Industrial Research (CSIR)	483 194	507 352	534 749	561 487
SA National Energy Research Institute (SANERI)	40 000	42 000	44 268	46 260
Total	1 270 749	1 393 382	1 462 556	1 489 075

The research and development tax incentive programme

The research and development tax incentive programme provides an incentive for private sector companies to increase their investment in research and development activities in South Africa. Economic studies have demonstrated the effectiveness of research and development incentives in generating additional research and ultimately increased innovation, productivity and economic growth. For eligible activities, an accelerated tax deduction at the rate of 150 per cent is available on scientific or technological research and development expenditure. Depreciation of capital items used for scientific or technological research and development will be accelerated at 50:30:20 of annual costs in the three years following their purchase. In partnership with National Treasury, the Department of Science and Technology ran a seminar at INSITE '06 on the benefits of the research and development tax incentives and to educate technical and financial staff to recognise and document eligible research and development activities as described in the Revenue Laws Amendment Act (2006).

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 31.2 Departmental receipts

	Audited outcome			Adjusted appropriation	Medium-term receipts estimate		
	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10
R thousand							
Departmental receipts	270	302	229	1 057	63	70	71
Sales of goods and services produced by department	40	17	43	50	55	61	62
Sales of capital assets	–	–	–	1 000	–	–	–
Financial transactions in assets and liabilities	230	285	186	7	8	9	9
Total	270	302	229	1 057	63	70	71

Programme 1: Administration

Administration conducts the overall management of the department and provides centralised support services. It ensures that funded organisations comply with good corporate governance practices and are aligned with the strategic focus of the national system of innovation. It monitors and evaluates the science councils. The new *Property Management* subprogramme covers functions and funds which have been devolved from the Department of Public Works.

Expenditure estimates

Table 31.3 Administration

Subprogramme	Audited outcome			Adjusted appropriation	Medium-term expenditure estimate		
	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10
R thousand							
Minister ¹	746	813	933	885	938	985	1 034
Deputy Minister ²	607	780	776	719	762	801	841
Management	3 808	5 840	4 668	6 375	5 228	5 485	5 831
Corporate Services	49 300	51 337	88 329	197 507	72 037	75 982	82 128
Governance	1 377	1 461	2 416	4 023	3 439	3 625	3 842
Property Management	2 034	2 327	2 519	2 702	2 918	3 147	3 462
Total	57 872	62 558	99 641	212 211	85 322	90 025	97 138
Change to 2006 Budget estimate				84 609	(56 650)	(68 642)	

1. Payable as from 1 April 2006. Salary: R 707 956. Car allowance: R 176 988.

2. Payable as from 1 April 2006. Salary: R 575 410. Car allowance: R 143 852.

Economic classification

Current payments	55 611	55 391	95 183	66 739	81 648	86 146	93 033
Compensation of employees	26 295	24 182	28 532	35 169	45 635	48 047	50 818
Goods and services	29 316	31 002	66 622	31 570	36 013	38 099	42 215
<i>of which:</i>							
Communication	1 910	2 246	2 282	3 029	1 720	1 806	1 914
Computer services	1 499	1 578	1 618	761	3 626	3 807	4 035
Consultants, contractors and special services	5 729	6 739	31 766	6 764	6 382	6 701	7 103
Inventory	2 181	2 296	2 264	2 562	1 905	2 000	2 120
Operating leases	2 239	4 870	3 053	2 430	739	775	822
Travel and subsistence	7 366	7 445	7 476	8 184	9 717	10 202	10 815
Financial transactions in assets and liabilities	–	207	29	–	–	–	–
Transfers and subsidies	88	83	2 930	2 369	2 184	2 315	2 448
Provinces and municipalities	88	83	87	27	–	–	–
Non-profit institutions	–	–	2 280	2 060	2 184	2 315	2 448
Households	–	–	563	282	–	–	–
Payments for capital assets	2 173	7 084	1 528	143 103	1 490	1 564	1 657
Buildings and other fixed structures	–	–	–	133 000	–	–	–
Machinery and equipment	2 173	7 084	1 528	10 103	1 490	1 564	1 657
Total	57 872	62 558	99 641	212 211	85 322	90 025	97 138

Details of major transfers and subsidies:

Non-profit institutions							
Current	–	–	2 280	2 060	2 184	2 315	2 448
Technology Top 100	–	–	2 280	2 060	2 184	2 315	2 448

Expenditure trends

Expenditure has increased at an average annual rate of 9 per cent from R58 million in 2003/04 to R97 million in 2009/10. In 2006/07, expenditure reached a peak of R212 million, due to an allocation of R133 million for the new building for the department's head office.

Programme 2: Research, Development and Innovation

The Research, Development and Innovation Programme provides leadership in long-term directed and cross-cutting research and innovation in the national system of innovation. It plays a key role in all the new areas of research and innovation in South Africa.

There are four subprogrammes:

- *Space Science* (including large scale astronomy facilities, satellite programmes and the potential development of the Southern Cape as a launch site) offers advantages to South Africa's security, development, economic growth and informed future planning. Funding is provided to programmes such as the Square Kilometre Array project
- *Hydrogen and Energy* drives targeted research programmes to create a scientific and knowledge base that will ensure broader socio-economic benefits for South Africa from the nascent global hydrogen economy
- *Biotechnology and Health* is focused on developing cross-cutting research, development and innovation support services, structures and platforms for interventions in biotechnology and health within the national system of innovation. It also focuses on aligning the research and development activities of industry, academia and research institutions. Funding is provided for programmes and initiatives such as the Innovation Fund, the International Centre for Genetic Engineering and Biotechnology, and the implementation of the hydrogen strategy
- *National Advisory Council on Innovation* funds the council, which provides policy advice to the Minister of Science and Technology on the role and contribution of innovation in promoting and achieving national objectives.

Expenditure estimates

Table 31.4 Research, Development and Innovation

Subprogramme	Audited outcome			Adjusted appropriation	Medium-term expenditure estimate		
	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10
R thousand							
Space Science	175 346	41 574	153 764	210 670	294 783	487 201	689 390
Hydrogen and Energy	1 117	16 310	21 678	33 788	33 666	62 835	66 116
Biotechnology and Health	118 157	269 115	158 075	152 063	207 560	227 674	259 209
National Advisory Council on Innovation	5 458	6 500	7 701	9 133	10 542	11 090	11 752
Total	300 078	333 499	341 218	405 654	546 551	788 800	1 026 467
Change to 2006 Budget estimate				(31 317)	60 371	245 448	
Economic classification							
Current payments	12 815	17 331	19 161	23 868	24 936	26 353	29 929
Compensation of employees	4 924	7 959	7 947	10 309	12 960	13 733	14 582
Goods and services	7 891	9 372	11 214	13 559	11 976	12 620	15 347
<i>of which:</i>							
Communication	575	488	574	546	461	484	513
Computer services	413	393	708	160	40	42	45
Consultants, contractors and special services	1 788	1 527	3 499	7 317	4 208	4 418	4 684
Inventory	833	442	927	498	449	471	500
Operating leases	29	18	264	174	147	154	164
Travel and subsistence	1 963	1 801	3 372	3 053	5 166	5 424	5 750
Transfers and subsidies	286 902	315 936	321 467	381 574	521 392	762 212	996 289
Provinces and municipalities	26	39	23	17	–	–	–
Departmental agencies and accounts	161 450	43 412	42 074	143 286	157 568	165 591	169 644
Universities and technikons	–	–	20 929	360	10 000	10 000	20 000
Public corporations and private enterprises	–	122 875	114	–	–	–	–
Non-profit institutions	125 426	149 610	258 041	237 661	353 824	586 621	806 645
Households	–	–	286	250	–	–	–
Payments for capital assets	361	232	590	212	223	235	249
Machinery and equipment	361	232	590	212	223	235	249
Total	300 078	333 499	341 218	405 654	546 551	788 800	1 026 467

Table 31.4 Research, Development and Innovation (continued)

R thousand	Audited outcome			Adjusted appropriation	Medium-term expenditure estimate		
	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10

Details of major transfers and subsidies:							
Departmental agencies and accounts							
Current	161 450	43 412	42 074	143 286	157 568	165 591	169 644
Space Science	–	–	13 074	93	–	–	–
Innovation Fund	161 450	28 412	–	128 193	141 818	148 990	152 295
South African Aids Vaccine Initiative	–	15 000	20 000	15 000	15 750	16 601	17 349
Square Kilometer Array	–	–	8 000	–	–	–	–
Institutional and programme support	–	–	1 000	–	–	–	–
Universities and technikons							
Current	–	–	20 929	360	10 000	10 000	20 000
Institutional and programme support	–	–	529	360	–	–	–
Space science	–	–	20 200	–	–	–	–
Biotechnology strategy	–	–	200	–	–	–	–
International Centre for Genetic Engineering and Biotechnology	–	–	–	–	10 000	10 000	20 000
Public corporations							
Other transfers							
Current	–	122 875	114	–	–	–	–
Biotechnology strategy	–	122 875	–	–	–	–	–
Institutional and programme support	–	–	114	–	–	–	–
Non-profit institutions							
Current	125 426	149 610	258 041	217 661	243 824	266 121	277 220
Institutional and programme support	9 425	5 899	1 794	1 479	–	–	–
Space science	–	–	–	21 286	19 024	20 100	21 208
Square Kilometer Array	–	–	–	19 435	24 121	25 496	13 322
Hydrogen strategy	–	–	–	10 000	18 180	19 071	20 382
Innovation projects	–	–	–	3 500	4 601	4 510	5 159
Health Innovation	–	–	–	9 334	10 000	20 000	40 000
Biotechnology strategy	116 001	143 711	154 650	148 680	166 515	175 507	175 629
Innovation Fund	–	–	101 597	3 947	–	–	–
Women in science	–	–	–	–	1 383	1 437	1 520
Capital	–	–	–	20 000	110 000	320 500	529 425
Space science	–	–	–	20 000	20 000	15 000	15 000
Square Kilometer Array	–	–	–	–	80 000	265 000	471 900
Hydrogen strategy	–	–	–	–	10 000	40 500	42 525

Expenditure trends

Expenditure increased at an average annual rate of 10,6 per cent from R300 million in 2003/04 to R406 million in 2006/07, as a result of an increase in biotechnology and initiatives in the *Space Science* subprogramme. Expenditure continues to grow at an average annual rate of 36,3 per cent, mainly due to capital funding of R500 million over the MTEF period for 10 per cent of the Square Kilometre Array radio telescope project.

Service delivery objectives and indicators

Recent outputs

The South African licensing of internationally competitive technologies by CapeBio and BioPAD in partnership with local biotechnology companies was a key achievement in 2006/07.

The Sumbandila SAT could not be launched in December 2006 because of adverse weather conditions in Russia.

Cabinet approved the Pebble Bed Modular Reactor (PBMR) human capital and innovation frontier programme, designed to build up local expertise along the whole technology value chain of PBMR development.

The department has established two university chairs and made bursary awards to undergraduate and post-graduate students.

The awareness programme included a national youth nuclear conference and school based programmes.

In 2006/07, Innovation Fund activities were expanded through its commercialisation office to support innovative research and development activities by SMMEs, which included broad based black economic empowerment (BEE) as a targeted outcome.

Examples of Innovation Fund activities and other projects that the commercialisation office is investing in, include:

Red Five Labs: In partnership with the department, HBD Venture Capital is creating breakthrough software for mobile phones running on Microsoft software.

Robotics: SMME Robonica aims to develop educational robotics technology, involving black engineers.

Centre for Quantum Technology: The flagship project is the development of a low cost quantum key exchange unit that provides absolute security in the transfer of information.

Improvement of indigenous abalone through genetics: The project will address the decrease in the supply of abalone from natural fisheries due to over-fishing and illegal trade, and improve South Africa's competitiveness in the aquaculture industry.

Intellectual Property Management Office (IPMO): During the 2005 round, R2,6 million was paid out under the Patent Support Fund and R1,2 million under the Patent Incentive Fund. Total payments under both instruments since their inception in 2004 have been R7 million. The training and development of black candidates to be patent attorneys has been progressing well. Three candidates have spent combined periods of up to six months with intellectual property law firms.

Square Kilometre Array: South Africa has been shortlisted for the Square Kilometre Array (SKA) radio telescope, a €1 billion international project to create a receiving surface of a million square metres, one hundred times larger than the biggest receiving surface now in existence. The department has completed a bill to establish astronomy reserves that will sustain a geographical competitive edge for Southern Africa. The Karoo Array Telescope (KAT) is South Africa's demonstrator telescope in its bid to host the SKA. The KAT is designed to have a modular and scalable upgrade path and will be a world class science instrument.

Selected medium-term output targets

Research, Development and Innovation

Measurable objective: Build programmes within the national system of innovation, particularly using the department's resources to ensure that South Africa has an evolving world class research and development innovation portfolio.

Subprogramme	Output	Measure/Indicator	Target
Space Science	Establish and operate a South African space agency Launch and operate Sumbandila SAT SKA/KAT Foundation for Technological Innovation (FTI)	Agency established and operational Launch completed and mission control TTC in place International partnerships agreed FTI established	December 2007 July 2007 March 2008 December 2007
Hydrogen and Energy	Hydrogen and fuel cell technologies strategy Agreements with private sector on jointly funded flagship projects Development of competence centres	Strategy approved by Cabinet Number of joint department/ private sector funded projects by August 2007 Number of consortium based competence hubs established by June 2007	May 2007 3 funded projects 2 hubs
Biotechnology and Health	Biosafety platform that can assist in development of biosafety requirements Structural biology strategy	Business plan completed by Plantbio Structural biology strategy approved	August 2007 October 2007

Programme 3: International Co-operation and Resources

The *International Co-operation and Resources* programme develops and services bilateral and multilateral relationships and agreements in science and technology to strengthen the national system of innovation and enable a net in-flow of knowledge, capacity and resources into South Africa and Africa.

There are three subprogrammes:

- *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 EU 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		
	2003/04	2004/05	2005/06	appropriation	2007/08	2008/09	2009/10
R thousand							
Multilaterals and Africa	27 554	28 954	57 529	80 763	68 473	92 735	102 350
International Resources	4 864	8 715	9 517	29 791	31 281	32 970	34 948
Bilateral Co-operation	8 090	8 501	10 589	17 392	18 262	19 248	20 403
Total	40 508	46 170	77 635	127 946	118 016	144 953	157 701
Change to 2006 Budget estimate				28 525	7 399	21 328	
Economic classification							
Current payments	20 474	24 320	31 777	65 127	51 411	74 644	85 650
Compensation of employees	7 899	10 361	13 411	16 410	21 105	22 266	23 550
Goods and services	12 575	13 959	18 366	48 717	30 306	52 378	62 100
<i>of which:</i>							
Communication	880	924	843	1 677	4 279	6 039	6 388
Computer services	555	584	443	652	1 663	2 348	2 483
Consultants, contractors and special services	2 641	2 773	2 886	8 030	4 209	11 355	12 577
Inventory	1 687	1 776	541	1 981	680	714	757
Operating leases	135	143	213	159	406	573	606
Travel and subsistence	3 395	3 565	9 797	9 668	3 598	9 278	15 362
Transfers and subsidies	19 625	21 326	45 395	62 670	66 459	70 155	71 888
Provinces and municipalities	11	25	37	11	–	–	–
Departmental agencies and accounts	11 713	16 325	25 168	28 847	26 530	27 830	27 122
Universities and technikons	–	–	1 855	1 149	–	–	–
Public corporations and private enterprises	–	–	10 173	9 024	–	–	–
Foreign governments and international organisations	–	11	–	–	–	–	–
Non-profit institutions	7 901	4 965	7 997	23 603	39 929	42 325	44 766
Households	–	–	165	36	–	–	–
Payments for capital assets	409	524	463	149	146	154	163
Machinery and equipment	409	524	463	149	146	154	163
Total	40 508	46 170	77 635	127 946	118 016	144 953	157 701

Table 31.5 International Co-operation and Resources (continued)

R thousand	Audited outcome			Adjusted appropriation	Medium-term expenditure estimate		
	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10
Details of major transfers and subsidies:							
Departmental agencies and accounts							
Current	11 713	16 325	25 168	28 847	26 530	27 830	27 122
Africa Institute of South Africa	11 713	16 325	18 968	24 954	26 530	27 830	27 122
Global science	–	–	6 200	3 893	–	–	–
Universities and technikons							
Current	–	–	1 855	1 149	–	–	–
Global science	–	–	1 855	1 149	–	–	–
Public corporations							
Other transfers							
Current	–	–	10 173	9 024	–	–	–
Global Science	–	–	10 173	9 024	–	–	–
Foreign governments and international organisations							
Current	–	11	–	–	–	–	–
Global science	–	11	–	–	–	–	–
Non-profit institutions							
Current	7 901	4 965	7 997	23 603	39 929	42 325	44 766
Global science	7 901	4 965	7 997	23 603	39 929	42 325	44 766

Expenditure trends

Expenditure increased at an average annual rate of 46,7 per cent, from R41 million in 2003/04 to R128 million in 2006/07, due to increased funding for leveraging international resources through matched funding agreements. Over the MTEF period, expenditure is expected to increase at an average annual rate of 7,2 per cent, because of the department's expanded involvement in NEPAD's African science and technology programme, and the EU Sixth Framework Programme.

Service delivery objectives and indicators

Recent outputs

The preparation of the co-operation framework on innovation systems between South Africa and Finland was completed.

NEPAD's second ministerial conference on science and technology was held in August 2006, where a consolidated plan of action for science and technology in Africa was adopted.

New bilateral agreements were signed with two African countries, Mozambique and Mali, and Slovakia and Argentina. On the multilateral front, the department, together with the Department of Foreign Affairs, the Third World Academy of Science and the G77 secretariat, hosted and chaired a G77 science and technology ministerial conference. This was the only sector specific ministerial meeting that South Africa hosted in its year of chairing the group. It was at this meeting that the Consortium on Science Technology and Innovation for the South, as called for in the Doha plan of action, was developed. The OECD's Committee for Scientific and Technological Policy performed a peer review of South Africa's national system of innovation, which will inform the establishment of the proposed Foundation for Technological Innovation and the development of a national industrial policy.

South Africa's bids to host the Square Kilometre Array telescope and the third major international laboratory of the International Centre for Genetic Engineering and Biotechnology (at the University of Cape Town) were completed in 2006/07.

Selected medium-term outputs targets

International Co-operation and Resources

Measurable objectives: Increase flows of scientific knowledge and resources to South Africa through the development and monitoring of bilateral and multilateral agreements and relationships.

Subprogramme	Output	Measure/Indicator	Target
Multilaterals and Africa	African co-operation in science and technology	Number of South-South partnerships and global science programmes Number of bilateral partnership programmes in all 5 regions in Africa	5 new partnerships or programmes 10 new programmes
International Resources	International resources (such as international research funding, foreign investment, donor support, location of global infrastructure, knowledge) for science and technology in Africa	Increase in international funds compared with the previous year.	At least R50 million in new funds from international sources
Bilateral Co-operation	Country to country co-operation and partnerships outside Africa	Increased co-operation with countries in Eastern Europe, the gulf region and Asia; increased development partnerships, especially with Scandinavia	10 new bilateral projects

Programme 4: Human Capital and Knowledge Systems

The *Human Capital and Knowledge Systems* programme provides leadership by developing and implementing policies and strategies in the following three areas of the national system of innovation: developing human capital in science, engineering, and technology, and developing science missions that leverage off geographical advantages; developing emerging research areas and setting up, developing and renewing key scientific infrastructure; and integrating indigenous knowledge systems into the national system of innovation.

There are three subprogrammes:

- *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. It interacts with key institutions in the production of science and technology knowledge and human resources for the national system of innovation. 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	Medium-term expenditure estimate		
	2003/04	2004/05	2005/06	appropriation	2007/08	2008/09	2009/10
R thousand							
Human Capital and Science Platforms	440 322	507 872	631 443	855 245	923 713	1 031 962	1 098 945
Indigenous Knowledge Systems	6 908	11 417	5 277	4 268	11 195	10 628	22 168
Emerging Research Areas and Infrastructure	1 559	1 829	2 301	3 929	322 421	379 818	450 120
Total	448 789	521 118	639 021	863 442	1 257 329	1 422 408	1 571 233
Change to 2006 Budget estimate				45 099	346 828	404 838	

Table 31.6 Human Capital and Knowledge Systems (continued)

R thousand	Audited outcome			Adjusted appropriation	Medium-term expenditure estimate		
	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10
Economic classification							
Current payments	8 354	17 351	16 486	24 972	21 755	22 874	24 194
Compensation of employees	2 802	9 755	9 682	13 414	14 665	15 402	16 290
Goods and services	5 552	7 595	6 804	11 558	7 090	7 472	7 904
<i>of which:</i>							
Communication	442	518	647	584	372	391	414
Computer services	117	137	171	434	148	155	165
Consultants, contractors and special services	402	669	1 834	2 352	375	394	417
Inventory	1 025	1 005	256	328	312	328	347
Operating leases	11	18	22	48	49	51	55
Travel and subsistence	1 988	1 778	2 913	3 645	4 795	5 035	5 337
Financial transactions in assets and liabilities	–	1	–	–	–	–	–
Transfers and subsidies	440 353	503 480	622 522	838 439	1 235 364	1 399 313	1 546 805
Provinces and municipalities	5	11	30	3	–	–	–
Departmental agencies and accounts	411 080	454 288	564 016	759 210	1 052 099	1 159 403	1 256 629
Universities and technikons	–	–	4 761	10 534	–	–	–
Public corporations and private enterprises	–	–	22 748	1 807	–	–	–
Non-profit institutions	29 268	49 181	30 643	66 883	183 265	239 910	290 176
Households	–	–	324	2	–	–	–
Payments for capital assets	82	287	13	31	210	221	234
Machinery and equipment	82	287	13	31	210	221	234
Total	448 789	521 118	639 021	863 442	1 257 329	1 422 408	1 571 233

Details of major transfers and subsidies:

Departmental agencies and accounts							
Current	404 239	450 288	548 776	709 210	1 002 099	1 018 297	1 059 970
National Research Foundation	404 239	446 288	512 641	586 671	650 299	685 847	692 671
Frontier science and technology	–	–	8 896	13 272	–	–	–
Science themes	–	–	14 639	28 957	–	–	–
Human resource development	–	–	12 600	54 607	183 500	236 810	266 143
Learnerships	–	4 000	–	3 703	6 300	6 640	7 023
South African national research network	–	–	–	22 000	162 000	89 000	94 133
Capital	6 841	4 000	15 240	50 000	50 000	141 106	196 659
National Research Foundation	6 841	4 000	4 240	–	–	–	–
Research and development infrastructure	–	–	–	50 000	50 000	141 106	196 659
Equipment placement	–	–	11 000	–	–	–	–
Universities and technikons							
Current	–	–	4 761	3 200	–	–	–
Science and youth	–	–	681	–	–	–	–
Frontier science and technology	–	–	3 400	–	–	–	–
Science themes	–	–	680	3 200	–	–	–
Capital	–	–	–	7 334	–	–	–
Frontier science and technology	–	–	–	7 334	–	–	–
Public corporations							
Other transfers							
Current	–	–	22 748	1 807	–	–	–
Frontier science and technology	–	–	12 362	1 066	–	–	–
Science themes	–	–	7 252	–	–	–	–
Learnerships	–	–	3 134	741	–	–	–

Table 31.6 Human Capital and Knowledge Systems (continued)

R thousand	Audited outcome			Adjusted appropriation	Medium-term expenditure estimate		
	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10
Non-profit institutions							
Current	29 268	49 181	30 643	34 217	78 265	95 410	136 167
Learnerships	–	–	1 866	–	–	–	–
Academies	2 290	2 500	2 500	3 000	4 274	4 820	6 815
Frontier science and technology	–	–	3 734	1 166	–	–	–
Science themes	13 983	25 681	3 143	6 513	39 991	42 132	58 151
Science and youth	7 294	11 000	15 900	20 038	29 000	43 188	54 525
Indigenous knowledge system	5 701	10 000	3 500	3 500	5 000	5 270	16 676
Capital	–	–	–	32 666	105 000	144 500	154 009
Frontier science and technology	–	–	–	32 666	105 000	144 500	154 009

Expenditure trends

Expenditure increased at an average annual rate of 24,4 per cent, from R449 million in 2003/04 to R863 million in 2006/07. There is also steady annual growth of 22,1 per cent over the MTEF period, mainly due to new and increased support for science, engineering and technology human capital initiatives and for research and development infrastructure. The National Research Foundation receives the largest transfer from this programme: R2 billion over the medium term.

Service delivery objectives

Recent outputs

Developing science skills among the youth is important for the long-term sustainability of the sector, and the youth into science strategy has been finalised. The policy on the network of science centres, adopted in 2005, has been refined, with the development and approval of a 25-year implementation plan.

South Africa's heritage in palaeontology has been highlighted in the national research and development strategy as one of South Africa's main geographical advantages. The African origins platform aims to exploit this for the benefit of new knowledge production, training the next generation of experts in this area, fostering innovations based on new and applied knowledge in palaeontology and archaeology, and establishing research collaborations in Africa and internationally. In a process that began during 2004, the development of a strategy for supporting research in this area was completed in 2006, with support from a wide variety of stakeholders. The finalisation and approval of the strategy has been a major output and creates the environment for research, human capital development and innovation to thrive in this area.

The establishment of the South African research chairs initiative is significant for human capital development. The response from the targeted higher education sector has been extremely positive. Programmes aimed at other midstream points of the human capital pipeline, such as a bursary initiative for honours students, a professional development programme and a post doctoral fellowship, were launched in 2006/07.

The existing centres of excellence continue to promote cross-disciplinary and cross-institutional collaborations. The centres are attracting more doctoral students and post-doctoral researchers.

The national nanotechnology strategy was approved by Cabinet and launched in March 2006 and is being implemented. The national nanotechnology equipment programme, part of the national equipment programme for research and development infrastructure, is being rolled out in partnership with the National Research Foundation and will provide the required specialised tools for researchers. Plans for setting up two nanotechnology centres are under way.

A high performance computing centre is being set up at the CSIR and the University of Cape Town. A joint initiative between the Department of Science and Technology and the Meraka Institute, the centre will provide

computing power for research and innovation activities. The South African national research network (SANReN) will provide national broadband networks and global connectivity for transmitting research data.

The national effort to develop, promote, recognise and protect indigenous knowledge systems is gaining momentum. The national indigenous knowledge systems office, established in April 2006, for implementing the indigenous knowledge systems policy was a significant milestone. The launch of an indigenous knowledge systems laboratory on traditional medicines in 2006 is also notable.

Selected medium-term outputs targets

Human Capital and Knowledge Systems

Measurable objective: Use the resources of the Department of Science and Technology and institutions to develop and maintain a thriving, expanding and representative human capital base.

Subprogramme	Output	Measure/Indicator	Target
Human Capital and Science Platforms	South African research chairs initiative	Number of research chairs at higher education institutions established and funded by June 2007	20 research chairs
		Number of candidate research chairs from science systems outside South Africa identified by April 2008	35 candidate research chairs
	Youth into science strategy implemented	Increase in youth participating in National Science Week Increase in disadvantaged youth participating in youth into science strategy Number of unemployed graduates benefiting from internships and mentorships annually	25 000 more youth Annual increase of 750 disadvantaged youth 100 unemployed graduates
	Science, engineering and technology human capital programmes	Number of schools (mathematics and science educators) equipped to support curriculum delivery and learners participating in competitions/olympiads	450 schools
Science missions and platforms		Number of honours students in support programmes for mid-stream human capital pipeline by December 2007	200 honours students
		Concept for support programme for engineering skills developed, approved and implemented	January 2008
		Decadal plan for astronomy geographical advantage strategy developed and approved	December 2007
Indigenous Knowledge Systems: Knowledge Development		Palaeo-sciences research development plan approved and funded, and grants given under the African origins platform strategy to individual and group researchers	September 2007
		Marine research strategy incorporating African coelacanth ecosystem programme (ACEP) developed and approved and research grants funded	Research grants for ACEP: June 2007 Research grants for rest of strategy: December 2007
	National indigenous knowledge systems research agenda co-ordinated	Funding programme for indigenous knowledge systems research projects in place	March 2008
Emerging Research Areas and Infrastructure:	Establishment of a centre for high performance computing	Study completed on areas that need to be developed through indigenous knowledge systems laboratories: medicine, food, cosmetics, jewellery	December 2007
		First fully functional node of the Centre for High Performance Computing in Cape Town commissioned and operational	April 2007
	National broadband network for research	Second node in Tshwane, Gauteng, commissioned and operational	February 2009
	Layout of physical infrastructure for South African national research network (SANReN) phase 1	March 2009	
	Rollout of national equipment programme:	Database of equipment purchased and received by researchers in place and functional	December 2007

Programme 5: Socio-Economic Partnerships

Socio-Economic Partnerships provides services in co-ordinating and leading science and technology interventions for social impact and economic development.

There are three subprogrammes:

- *Science and Technology for Economic Impact* leads and supports a number of strategic science and technology interventions requiring interdepartmental and government and industry co-operation to achieve government's strategic economic growth and development objectives. This subprogramme provides or transfers funds to various institutions such as the HSRC, the CSIR, and SANERI, to fund projects.

- *Science and Technology for Social Impacts* aims to introduce and promote innovative technology and management competencies to support the creation of sustainable job and wealth opportunities in poor municipal areas, and, with a focus on sustainability, contributing to issues of human settlement. The activities require interdepartmental co-operation for extending scientific research and technology applications to address identified priorities in different sectors and in the Millennium Development Goals. Funding is provided for programmes or projects such as Tshumisano, technology for sustainable livelihoods, technology planning, diffusion biofuels, and aquaculture.
- *Science and Technology Investment* leads and supports the development of science and technology indicators, monitors national science and technology expenditure and planning, and implements programmes to improve private sector expenditure on research and development.

Expenditure estimates

Table 31.7 Socio-Economic Partnerships

Subprogramme	Audited outcome			Adjusted appropriation	Medium-term expenditure estimate		
	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10
R thousand							
Science and Technology for Economic Impact	435 445	510 016	714 965	781 118	855 252	904 275	945 726
Science and Technology for Social Impact	102 570	157 381	166 106	219 304	257 143	262 503	261 180
Science and Technology Investment	6 320	2 135	2 686	7 418	22 866	26 533	28 916
Total	544 335	669 532	883 757	1 007 840	1 135 261	1 193 311	1 235 822
Change to 2006 Budget estimate				(123 917)	(123 948)	(213 973)	

Economic classification

Current payments	8 319	12 747	10 890	24 155	42 476	46 941	51 390
Compensation of employees	3 790	5 948	5 553	11 655	18 599	19 599	21 290
Goods and services	4 529	6 799	5 337	12 500	23 877	27 342	30 100
<i>of which:</i>							
Communication	242	284	354	824	639	671	711
Computer services	233	273	341	64	200	210	223
Consultants, contractors and special services	1 584	1 159	2 321	4 199	18 250	21 433	23 835
Inventory	182	700	192	246	392	412	436
Operating leases	51	59	74	326	150	158	167
Travel and subsistence	901	757	1 320	2 818	3 339	3 506	3 716
Transfers and subsidies	535 859	656 623	872 772	983 499	1 092 400	1 146 164	1 184 214
Provinces and municipalities	9	6 574	16	5	–	–	–
Departmental agencies and accounts	164 526	198 736	177 242	325 531	388 688	392 422	398 607
Universities and technikons	–	16 289	4 729	624	–	–	–
Public corporations and private enterprises	334 554	366 326	563 927	494 967	517 352	544 749	571 487
Non-profit institutions	36 770	59 770	126 855	162 338	186 360	208 993	214 120
Households	–	8 928	3	34	–	–	–
Payments for capital assets	157	162	95	186	385	206	218
Machinery and equipment	157	162	95	186	385	206	218
Total	544 335	669 532	883 757	1 007 840	1 135 261	1 193 311	1 235 822

Details of major transfers and subsidies:

Municipalities							
Current	9	6 574	16	5	–	–	–
Regional Services Council levies	9	13	16	5	–	–	–
Technology for poverty alleviation	–	6 561	–	–	–	–	–

Table 31.7 Socio-Economic Partnerships (continued)

R thousand	Audited outcome			Adjusted appropriation	Medium-term expenditure estimate		
	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10
Departmental agencies and accounts							
Current	164 526	198 736	177 242	325 531	388 688	392 422	398 607
Technology planning and diffusion	46 176	47 900	6 470	67 858	49 339	53 922	59 108
Advanced manufacturing technology strategy	2 750	21 000	–	51 800	62 400	56 204	59 445
South African National Energy Research Institute	–	10 000	–	40 000	42 000	44 268	46 260
National public assets	30 000	35 000	43 000	43 000	43 000	45 322	47 936
Human Science Research Council	70 030	83 336	104 293	119 873	155 949	156 706	149 858
Indicators	4 500	–	–	–	–	–	–
Leveraging services strategy	–	–	–	3 000	–	–	–
Resource based industries	–	–	650	–	–	–	–
Centres of excellence	11 070	1 500	20 000	–	–	–	–
Technology for poverty alleviation	–	–	1 479	–	–	–	–
Technology for sustainable livelihoods	–	–	1 350	–	–	–	–
Tshumisano Trust	–	–	–	–	36 000	36 000	36 000
Universities and technikon							
Current	–	16 289	4 729	624	–	–	–
Technology for sustainable livelihoods	–	16 289	2 447	624	–	–	–
South African National Energy Research Institute	–	–	500	–	–	–	–
Information communication technology	–	–	282	–	–	–	–
Technology for poverty alleviation	–	–	1 500	–	–	–	–
Public corporations							
Other transfers							
Current	334 554	366 326	563 927	494 967	517 352	544 749	571 487
Technology for sustainable livelihoods	–	–	31 051	–	–	–	–
Technology planning and diffusion	–	–	5 000	–	–	–	–
Advanced manufacturing technology strategy	–	–	41 515	–	–	–	–
Resource based industries	–	–	15 050	642	–	–	–
Information communication technology	–	–	13 741	–	–	–	–
Council for Scientific and Industrial Research	323 014	348 326	431 649	483 194	517 352	544 749	571 487
Council for Scientific and Industrial Research: National Laser Centre	11 540	18 000	18 000	–	–	–	–
Technology for poverty alleviation	–	–	7 921	11 131	–	–	–
Non-profit institutions							
Current	36 770	59 770	126 855	162 338	186 360	208 993	214 120
Resource based industries	650	10 000	4 380	29 358	31 500	33 201	35 116
Technology planning and diffusion	–	–	68 824	19 500	–	–	–
Information communication technology	4 856	9 000	–	29 200	54 210	69 977	68 148
Technology for poverty alleviation	9 263	24 200	2 000	31 904	40 000	42 160	44 268
Technology for sustainable livelihoods	22 001	16 570	12 151	52 376	55 650	58 655	61 588
Nuclear Energy Corporation of South Africa: Fluoro chemicals	–	–	20 000	–	–	–	–
South African National Energy Research Institute	–	–	19 500	–	–	–	–
Biofuels	–	–	–	–	5 000	5 000	5 000
Households							
Other transfers							
Current	–	8 928	3	34	–	–	–
Technology for sustainable livelihoods	–	8 928	–	–	–	–	–
Gifts and donations	–	–	3	34	–	–	–

Expenditure trends

Expenditure growth over the past three years was fairly robust, at an average annual rate of 22,8 per cent, from R544 million in 2003/04 to R1 billion in 2006/07, due to increased support for programmes on biofuels and

ICT, among others, and the advanced manufacturing technology strategy. From 2007/08, expenditure is set to grow at 7 per cent over the MTEF period.

Service delivery objectives and indicators

Recent outputs

A number of national research strategies have been developed:

- an energy research and development strategy and an associated action plan
- a climate change research and development strategy to guide South Africa's efforts in both mitigation and adaptation technologies, and to create the framework for building human capital in this area
- a comprehensive ICT research and development strategy, developed in close consultation with key role-players.

The department has been involved in developing proposals on research, development and technical standards for the biofuels industrial strategy. The implementation of the advanced manufacturing technology strategy and the advanced metals initiative were reviewed by an independent panels of experts.

The department works closely with provinces to identify technological interventions that can support provincial growth and development. For example, a study was done on the cold chain and post-harvesting technology needs of the fresh fruit industry.

Fablabs is a group of off-the-shelf, industrial grade fabrication and electronics tools, wrapped in open source software and programmes, which are available to communities, particularly young people, who want to experiment with product development. Two fablabs (in Soshanguwe and Bloemfontein) are already functional, and are in constant use.

There has been significant development in the agroprocessing industry, particularly essential oils. This involves the application of indigenous knowledge, agricultural science, chemistry, medical science and improved mature manufacturing technology to build bridges out of the second economy and facilitate integration with first economy industries such as pharmaceuticals.

There have been important gains over the past three years in empowerment and small scale industry development in aquaculture. From piloting a project in trout rearing in Western Cape using small scale, steel cage culture technology (6-8 tonnes capacity a year), emerging farmers were encouraged to form a co-operative and had a successful first harvest of 51,4 tonnes with an estimated gross value of more than R1 million. The co-operative has been further assisted in securing an uptake agreement for 200 tonnes, and the number of members of the co-operative will treble to service the agreement.

In collaboration with National Treasury, the department has made considerable progress in structuring a framework for reporting, across government, on science and technology expenditure. This framework includes a survey instrument with internationally benchmarked definitions of science and technology activities. It will allow for science and technology expenditure reporting by all government departments to be integrated into future ENE publications.

Selected medium-term output targets

Socio- Economic Partnerships

Measurable objective: Build partnerships and programmes to ensure the appropriate contribution of science and technology within different sectors.

Subprogramme	Output	Measure/Indicator	Target
Science and Technology for Economic Impact	Directed science, engineering and technology programmes demonstrating potential for positive economic results	Number of new flagship programmes that advance the 2006 ICT research and development strategy Number of new chairs of energy research and development under the South African National Energy Research Institute in 2007 Number of technology interventions that support provincial growth and development strategies in 2007/08	1 additional flagship programme 3 new chairs 2 provincially-based interventions
Science and Technology for Social Impact	Research on science and poverty and unemployment Research on analytical modelling for integrated and sustainable development planning Activities to support decision-making across government	Research report and a conference on the definitions of poverty and underdevelopment Research report on scenarios for reducing unemployment Research report and conference on findings of special study Number of reports on alternative, more affordable and effective technology solutions in government service delivery during 2007/08	Draft report by July 2007 Conference in August 2007 Final report by August 2007 Draft report by June 2007, Conference by December 2007 5 reports
Science and Technology investments	Effective planning and efficient investment in science and technology by government departments Reports on performance of science and technology indicators Evaluation of the research and development tax incentives programme	Research and development plans and strategic plans approved by Cabinet Research and development survey report Innovation survey report Monitor the uptake, awareness and impact of research and development tax incentives	2007/08 2007/08 2007/08 2007/08, and annually thereafter

Public entities and other agencies

Human Sciences Research Council

The Human Sciences Research Council of South Africa (HSRC) is a statutory body established in 1968. It supports development in South Africa and Africa by conducting applied social science research projects and co-ordinating research in terms of the Human Sciences Research Act (1968). As a result of the policy shift to focus more on the public purpose of human science research, a new HSRC Bill was introduced to Cabinet in December 2006.

It primarily conducts large, policy relevant research projects for public sector users, NGOs and international development agencies. The HSRC has aligned its research structures and activities to major development priorities, with the focal areas covering: technology and education; democracy and governance; integrated rural and regional development; and the social aspects of HIV and Aids and health. Future research work includes understanding the extent of poverty in rural areas, the impact of HIV and Aids, and how to leverage the service sector for better economic growth.

Allocations for the MTEF period are R130 million, R137 million and R143 million. In addition, the HSRC has received ring-fenced allocations of R28 million, R29 million and R29 million for the MTEF period, giving rise to an increase of over 140 per cent between 2002/2003 and 2007/2008. Compensation of employees is at 43 per cent of total expenditure.

Table 31.8 Financial summary for the Human Sciences Research Council (HSRC)

R thousand	Outcome			Estimated outcome	Medium-term estimate		
	Audited 2003/04	Audited 2004/05	Audited 2005/06		2007/08	2008/09	2009/10
Revenue							
Non-tax revenue	64 510	91 949	125 170	74 770	84 229	88 187	97 007
Sale of goods and services other than capital assets	51 053	75 359	111 353	58 029	65 370	68 442	75 287
<i>Of which:</i>							
<i>Social science research revenue</i>	51 053	75 359	111 353	58 029	65 370	68 442	75 287
<i>Other non-tax revenue</i>	13 457	16 590	13 817	16 741	18 859	19 745	21 720
Transfers received	122 643	145 459	91 833	186 756	214 911	226 653	236 941
Total revenue	187 153	237 407	217 003	261 526	299 140	314 840	333 948
Expenses							
Current expense	184 507	229 056	214 889	258 222	295 463	310 974	329 696
Compensation of employees	70 777	82 816	83 230	110 808	127 389	134 496	142 112
Goods and services	108 036	140 058	126 275	140 881	160 802	168 834	179 175
Depreciation	5 694	6 182	5 384	6 533	7 272	7 644	8 409
Transfers and subsidies	2 856	3 558	595	3 304	3 677	3 866	4 252
Total expenses	187 363	232 614	215 484	261 526	299 140	314 840	333 948
Surplus / (Deficit)	(210)	4 793	1 519	-	-	-	-

Balance sheet data

Carrying value of assets	57 930	49 494	48 988	85 698	104 583	116 926	121 650
Investments	39 352	29 070	14 273	14 940	15 687	16 472	17 295
Inventory	1 724	1 474	1 312	2 124	2 230	2 342	2 459
Receivables and prepayments	27 679	33 731	37 345	22 539	23 666	24 850	26 092
Cash and cash equivalents	8 995	1 305	1 781	1 758	1 846	1 938	2 035
Total assets	135 680	115 074	103 699	127 059	148 012	162 527	169 531
Capital and reserves	53 419	46 994	44 275	80 291	94 305	104 365	108 791
Trade and other payables	74 707	60 608	50 680	38 278	44 792	48 801	50 911
Provisions	7 554	7 472	8 744	8 490	8 915	9 361	9 829
Total equity and liabilities	135 680	115 074	103 699	127 059	148 012	162 527	169 531

Source: Human Sciences Research Council

Council for Scientific and Industrial Research

The Council for Scientific and Industrial Research (CSIR) is governed by the Scientific Research Council Act (1988), as amended. The CSIR's mandate is to foster industrial and scientific development in the national interest, through multidisciplinary research and technological innovation, either by itself or in partnership with public and private sector institutions.

The CSIR generates about 60,7 per cent of total revenue from own income, 59,4 per cent of which is generated through sales of goods and services. The allocations for the MTEF period are R507 million, R535 million and R562 million. In addition, the CSIR has received ring-fenced allocations of R19 million, R23 million and R22 million for the MTEF period. Compensation of employees is at 56 per cent of total expenditure. The CSIR is projecting a surplus of about R24 million for 2007/08. The CSIR has consistently reported surpluses in the past, peaking at R78 million in 2004/05.

Table 31.9 Financial summary for the Council for Scientific and Industrial Research (CSIR)

R thousand	Outcome			Estimated outcome	Medium-term estimate		
	Audited 2003/04	Audited 2004/05	Audited 2005/06		2007/08	2008/09	2009/10
Revenue							
Non-tax revenue	654 239	724 265	740 786	716 255	717 010	751 808	788 348
Sale of goods and services other than capital assets	638 931	646 777	612 156	689 179	689 631	724 112	760 318
<i>Of which:</i>							
<i>Scientific research revenue</i>	638 931	646 777	612 156	689 179	689 631	724 112	760 318
<i>Other non-tax revenue</i>	15 308	77 488	128 630	27 076	27 379	27 696	28 030
Transfers received	321 996	356 992	391 077	423 854	445 046	469 078	492 532
Total revenue	976 235	1 081 257	1 131 863	1 140 109	1 162 056	1 220 886	1 280 880

Table 31.9 Financial summary for the Council for Scientific and Industrial Research (CSIR) (continued)

R thousand	Outcome			Estimated outcome	Medium-term estimate		
	Audited 2003/04	Audited 2004/05	Audited 2005/06		2006/07	2007/08	2008/09
Expenses							
Current expense	938 136	1 004 888	1 072 623	1 116 584	1 137 016	1 194 238	1 252 902
Compensation of employees	539 741	567 621	634 196	640 875	646 381	678 700	712 635
Goods and services	360 390	394 753	398 046	433 017	445 426	462 360	479 117
Depreciation	37 788	42 272	40 239	41 560	43 916	51 819	59 724
Interest, dividends and rent on land	217	242	142	1 131	1 294	1 359	1 427
Transfers and subsidies	-	-	-	892	902	948	995
Total expenses	938 291	1 003 805	1 073 744	1 117 476	1 137 919	1 195 185	1 253 897
Surplus / (Deficit)	37 944	77 452	58 119	22 634	24 137	25 701	26 983
Balance sheet data							
Carrying value of assets	218 884	228 950	300 139	336 617	354 961	376 142	398 618
Investments	39 150	29 895	17 842	17 832	18 724	19 660	20 643
Inventory	50 032	65 504	46 866	59 307	70 273	73 786	77 475
Receivables and prepayments	149 512	143 157	159 980	180 631	189 577	198 989	208 859
Cash and cash equivalents	214 108	304 209	294 011	292 544	291 080	294 314	292 386
Total assets	671 686	771 715	818 838	886 931	924 615	962 891	997 981
Capital and reserves	183 975	262 388	319 932	342 562	366 700	392 403	419 387
Post retirement benefits	148 224	107 307	14 897	14 897	14 897	14 897	14 897
Trade and other payables	268 246	343 160	418 709	461 190	473 966	482 837	487 055
Provisions	71 241	58 860	65 300	68 282	69 052	72 754	76 642
Total equity and liabilities	671 686	771 715	818 838	886 931	924 615	962 891	997 981

Source: Council for Scientific and Industrial Research

National Research Foundation

The National Research Foundation (NRF) was established by the National Research Foundation Act (1998). As the government's national agency responsible for promoting and supporting research, the NRF aims to uphold excellence in its investment in knowledge, people, and infrastructure. The foundation's task is to advance research in all fields of the humanities, the social and natural sciences, engineering and technology.

The NRF's main sources of income are government transfers and tendered contract research. The growth in transfers averaged an annual 60 per cent between 2003/2004 and 2009/2010, and is projected at 65 per cent over the MTEF period. The NRF receives about 49 per cent from the Department of Science and Technology as a parliamentary grant. Included under goods and services are items such as operating expenses for grants, the Innovation Fund and the Technology and Human Resource for Industry Programme (THRIP). Allocations over the MTEF period are R624 million, R657 million and R686 million. In addition, the NRF has received ring-fenced allocations of R54 million, R66 million and R44 million for the MTEF period. The allocations to the Innovation Fund, including VAT, are R142 million (R9 million for VAT), R149 million (R9 million for VAT) and R152 million (R6 million for VAT) over the MTEF period. Compensation of employees is about 19,5 per cent of total expenses.

Table 31.10 Financial summary for the National Research Foundation

R thousand	Outcome			Estimated outcome	Medium-term estimate		
	Audited 2003/04	Audited 2004/05	Audited 2005/06		2006/07	2007/08	2008/09
Revenue							
Non-tax revenue	353 850	500 639	458 783	701 810	715 626	808 563	804 077
Sale of goods and services other than capital assets	9 872	34 928	40 545	48 230	50 272	53 288	56 486
<i>Of which:</i>							
<i>Administration fees</i>	9 872	28 071	32 886	39 772	40 967	43 425	46 031
<i>Zoo sales</i>	–	6 857	7 659	8 458	9 305	9 863	10 455
<i>Contributions received</i>	343 978	465 711	418 238	653 580	665 354	755 275	747 592
Transfers received	378 966	413 669	535 373	589 157	678 599	722 525	729 740
Total revenue	732 816	914 308	994 156	1 290 967	1 394 225	1 531 088	1 533 817
Expenses							
Current expense	244 892	326 277	433 819	491 019	494 480	525 998	554 820
Compensation of employees	142 985	174 206	245 931	245 534	272 193	290 454	306 351
Goods and services	84 422	133 189	176 624	222 203	198 951	210 808	222 249
Depreciation	17 380	18 642	11 102	23 273	23 336	24 736	26 220
Interest, dividends and rent on land	105	240	162	9	–	–	–
Transfers and subsidies	491 763	592 657	614 369	833 355	899 745	1 005 090	978 997
Total expenses	736 655	918 934	1 048 188	1 324 374	1 394 225	1 531 088	1 533 817
Surplus / (Deficit)	(3 839)	(4 626)	(54 032)	(33 407)	0	0	0
Balance sheet data							
Carrying value of assets	130 394	131 856	163 078	169 582	179 757	190 542	201 975
Investments	71 969	97 453	96 318	100 103	104 484	109 200	114 273
Inventory	1 878	2 801	2 863	2 980	3 159	3 348	3 549
Receivables and prepayments	682 142	722 811	738 304	749 165	794 115	841 762	884 268
Cash and cash equivalents	456 925	426 407	311 506	280 000	296 800	314 608	333 484
Total assets	1 343 308	1 381 328	1 312 069	1 301 830	1 378 315	1 459 461	1 537 549
Capital and reserves	250 138	192 035	169 095	142 498	152 673	163 458	174 891
Borrowings	–	135	852	744	789	836	886
Post retirement benefits	35 725	94 624	88 060	90 996	96 456	102 243	108 378
Trade and other payables	866 518	1 022 072	1 035 213	1 046 483	1 106 021	1 169 206	1 228 253
Provisions	10 247	14 535	15 729	16 800	17 808	18 876	20 009
Managed funds	180 680	57 927	3 120	4 309	4 568	4 842	5 132
Total equity and liabilities	1 343 308	1 381 328	1 312 069	1 301 830	1 378 314	1 459 461	1 537 548
Contingent liabilities	2 500	–	–	–	–	–	–

Source: National Research Foundation

Africa Institute of South Africa

The Africa Institute of South Africa (AISA), established under the Africa Institute of South Africa Act (2001), is a statutory body that does in-depth analysis of Africa's current affairs and gathers intelligence on Africa's future of Africa, the AU and NEPAD. It focuses primarily on political, socio-economic, international and development issues in contemporary Africa, and contributes to the goals of the national system of innovation because its research programmes have an impact on knowledge generation and human resource development. AISA is mandated to do research, support policy development, run training programmes, and establish, participate in and maintain networks for peace, development and prosperity in Africa. Much of this work has been done through the publication of research reports.

AISA generates about 98 per cent of its total revenue from sales of goods and services. The allocations over the MTEF period are R27 million, R28 million and R27 million, resulting in growth of about 23 per cent between 2002/03 and 2007/08. Compensation of employees is at 64 per cent of total projected expenditure. No surplus or deficit is envisaged at the end of 2007/08.

Godisa Trust

The Godisa Trust was transferred to the Small Enterprise Development Agency (SEDA) in the Department of Trade and Industry. The Department of Science and Technology made a final financial contribution of R24 million to Godisa Trust in 2006/07.

Tshumisano Trust

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

The focus of Tshumisano Trust is to leverage skills and product development support in universities of technology to create technology stations that can provide this support to small and medium sized businesses. The number of SMMEs that the trust is supporting through the technology stations programme has grown from 60 SMMEs in 2001/02 to well over 800 in 2005/06. In addition to housing the technology stations programme, the Tshumisano Trust is also facilitating the establishment of three institutes of advanced tooling as supporting an internship programme. A highlight in 2006/07 was hosting the first All Africa Technology Diffusion Conference, which attracted over 350 participants from more than 10 African countries.

Allocations to the Tshumisano Trust for the MTEF period are R36 million for each year. In addition, the trust has received ring-fenced allocations of R13,5 million, R13,5 million and R8,5 million over the MTEF period, which will be used for the advanced tooling institutes and internship programmes.

Academy of Science of South Africa

The Academy of Science of South Africa was established by the Academy of Science of South Africa Act (2001). ASSAf's objectives are: to promote common ground for scientific thinking across all disciplines; to promote innovative and independent scientific thinking; to promote the development of the intellectual capacity of all people; and to link South Africa with scientific communities at the highest levels, in particular in Africa. The academy publishes scientific reports, investigates matters of public interest about science, and manages South African journals.

Allocations over the MTEF period are R3,2 million, R3,3 million and R3,5 million. In addition, ASSAf has received ring-fenced allocations of R0,3 million, R0,5 million and R0,5 million over the MTEF period, for supporting of Quest magazine. 6 per cent of total revenue is generated through sales of goods and services. Compensation of employees is at 33,2 per cent of total expenditure. ASSAf projects a surplus of about R61 000 the end of 2007/08 year.

Table 31.11 Financial summary for the Academy of Science of South Africa

	Outcome			Estimated outcome	Medium-term estimate		
	Audited	Audited	Audited		2006/07	2007/08	2008/09
R thousand	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10
Revenue							
Non-tax revenue	181	402	544	600	675	765	827
Sale of goods and services other than capital assets	48	246	305	350	415	492	541
<i>Of which:</i>							
Admin fees	48	46	42	50	55	60	66
Sales by market establishments	–	200	263	300	360	432	475
Other non-tax revenue	133	156	239	250	260	273	286
Transfers received	2 433	2 547	4 048	5 500	6 400	6 820	7 003
Total revenue	2 614	2 949	4 592	6 100	7 075	7 585	7 830
Expenses							
Current expense	1 314	2 509	4 687	6 050	7 014	7 520	7 813
Compensation of employees	502	1 370	1 702	1 960	2 352	2 587	2 845
Goods and services	806	1 125	2 960	4 075	4 644	4 911	4 942
Depreciation	6	14	25	15	18	22	26
Transfers and subsidies	–	–	56	–	–	–	–
Total expenses	1 314	2 509	4 743	6 050	7 014	7 520	7 813
Surplus / (Deficit)	1 300	440	(151)	50	61	65	17

Table 31.11 Financial summary for the Academy of Science of South Africa (continued)

R thousand	Outcome			Estimated outcome	Medium-term estimate		
	Audited	Audited	Audited		2007/08	2008/09	2009/10
	2003/04	2004/05	2005/06	2006/07			
Balance sheet data							
Carrying value of assets	53	82	173	208	240	268	292
Cash and cash equivalents	3 556	4 390	5 103	3 536	3 565	3 602	3 595
Total assets	3 612	4 472	5 276	3 744	3 805	3 870	3 887
Capital and reserves	3 406	3 847	3 694	3 744	3 805	3 870	3 887
Trade and other payables	206	625	1 582	–	–	–	–
Total equity and liabilities	3 612	4 472	5 276	3 744	3 805	3 870	3 887

Source: Academy of Science of South Africa

South African National Energy Research Institute

A Cabinet decision, in terms of existing legislation, enabled the South African National Energy Research Institute to be established as a subsidiary of the Central Energy Fund (Pty) Ltd. SANERI's main aim is to build research capacity by funding research at universities and in the science councils. In 2006/07, SANERI was operationalised under the SANERI board.

A key future focus for SANERI is to ensure that South Africa's energy research continues to be globally competitive by increasing the scale and improving the focus of SANERI's research. This will build on and complement initiatives to establish centres, post-doctoral fellows and graduate assistant programmes in South Africa. Allocations over the MTEF period are R42 million, R44 million and R46 million.

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	2005/06		2005/06	2006/07			2006/07
1. Administration	96 974	99 796	99 641	211 582	629	212 211	217 211
2. Research, Development and Innovation	332 086	341 750	341 218	415 654	(10 000)	405 654	405 654
3. International Co-operation and Resources	75 557	77 756	77 635	131 946	(4 000)	127 946	122 946
4. Human Capital and Knowledge Systems	621 918	640 018	639 021	850 071	13 371	863 442	863 442
5. Socio-Economic Partnerships	860 104	885 135	883 757	1 004 840	3 000	1 007 840	1 007 840
Total	1 986 639	2 044 455	2 041 272	2 614 093	3 000	2 617 093	2 617 093

Economic classification							
Current payments	156 607	164 156	173 497	180 770	24 091	204 861	203 061
Compensation of employees	80 196	80 196	65 125	93 107	(6 150)	86 957	86 957
Goods and services	76 411	83 960	108 343	87 663	30 241	117 904	116 104
Financial transactions in assets and liabilities	–	–	29	–	–	–	–
Transfers and subsidies	1 829 227	1 879 494	1 865 086	2 299 469	(30 918)	2 268 551	2 268 551
Provinces and municipalities	229	229	193	26	37	63	64
Departmental agencies and accounts	942 742	940 340	808 500	1 221 549	35 325	1 256 874	1 259 374
Universities and technikons	–	22 036	32 274	–	12 667	12 667	29 667
Public corporations and private enterprises	449 649	479 166	596 962	483 194	22 604	505 798	585 798
Non-profit institutions	141 857	202 898	425 816	594 700	(102 155)	492 545	392 644
Households	294 750	234 825	1 341	–	604	604	1 004
Payments for capital assets	805	805	2 689	133 854	9 827	143 681	145 481
Buildings and other fixed structures	–	–	–	133 000	–	133 000	133 000
Machinery and equipment	805	805	2 689	854	9 827	10 681	12 481
Total	1 986 639	2 044 455	2 041 272	2 614 093	3 000	2 617 093	2 617 093

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

	Audited outcome			Adjusted appropriation	Medium-term expenditure estimates		
	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10
A. Permanent and full-time contract employees							
Compensation (R thousand)	45 705	58 199	65 119	86 951	112 956	119 041	126 523
Unit cost (R thousand)	199	278	277	289	375	395	398
Personnel numbers (head count)	230	209	235	301	301	301	318
B. Part-time and temporary contract employees							
Compensation (R thousand)	5	6	6	6	8	6	7
Personnel numbers (head count)	25	28	31	33	33	35	37
Total for department							
Compensation (R thousand)	45 710	58 205	65 125	86 957	112 964	119 047	126 530
Unit cost (R thousand)	179	246	245	260	338	354	356
Personnel numbers (head count)	255	237	266	334	334	336	355

Table 31.C Summary of expenditure on training

	Audited outcome			Adjusted appropriation	Medium-term expenditure estimates		
	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10
Training and staff development							
Expenditure (R thousand)	2 313	2 519	4 225	4 670	4 715	4 996	5 293
Number of employees trained (head count)	62	67	113	120	127	135	146
Bursaries (employees)							
Expenditure per programme (R thousand)	139	162	254	270	286	303	595
Number of employees (head count)	20	22	37	38	41	43	48
Total	2 452	2 681	4 479	4 940	5 001	5 299	5 888
Number of employees	82	89	150	158	168	178	194

Table 31.D Summary of expenditure on infrastructure

Description	Service delivery outputs			Adjusted appropriation	Medium-term expenditure estimate		
	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10
R thousand							
Other large infrastructure projects (Over R20 million)							
Science and Technology head office building	–	–	–	133 000	–	–	–
Research and development infrastructure	–	–	–	50 000	50 000	141 106	196 659
Frontier science and technology infrastructure	–	–	–	40 000	105 000	144 500	154 009
Square Kilometre Array infrastructure	–	–	–	–	80 000	265 000	471 900
Space infrastructure	–	–	–	20 000	20 000	15 000	15 000
Infrastructure transfers to other spheres, agencies and departments							
Research Equipment: Science systems	–	–	–	50 000	50 000	70 000	–
Research and development infrastructure	–	–	–	60 000	215 000	315 000	–
Total	–	–	–	353 000	520 000	950 606	837 568

