

# Vote 31

## Science and Technology

|                               | 2005/06<br>To be appropriated                            |                  |                         | 2006/07        | 2007/08        |
|-------------------------------|--|------------------|-------------------------|----------------|----------------|
| MTEF allocations<br>of which: | R1 986 639 000   |                  |                         | R2 183 392 000 | R2 440 560 000 |
|                               | <i>Current payments</i>                                  | <i>Transfers</i> | <i>Capital payments</i> |                |                |
|                               | R156 607 000   | R1 829 227 000   | R805 000                |                |                |
| Statutory amounts             | –  |                  |                         | –              | –              |
| Responsible minister          | Minister of 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 objective

#### Programme 1: Administration

**Purpose:** Provide core support services, including finance, human resources, legal services and IT, and manage the governance and reporting system for government-funded science and technology in general and the department's institutions and programmes in particular.

#### Programme 2: Science and Technology Expert Services

**Purpose:** Provide expert content-based services to the line programmes, the executive committee and the national system of innovation (NSI), across a range of relevant science and technology domains. Provide research and innovation management practice and policy.

**Measurable objective:** Deliver required outcomes within the strategic themes and portfolio of the department to give effect to the strategy and mandate of the NSI.

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

**Purpose:** Take responsibility for developing bilateral and multilateral co-operation in science and technology to strengthen the NSI, and establish a technological intelligence capacity to monitor and evaluate international science and technology trends.

**Measurable objective:** Increase flows of scientific knowledge and resources to South Africa by participating in joint programmes.

#### Programme 4: Frontier Science and Technology

**Purpose:** Provide leadership in relevant, long-term and cross-cutting research, development, innovation and human capital development across the NSI.

**Measurable objective:** Build research, innovation and human capital programmes within the NSI, effectively using the resources of the department. Develop public research institutions to make sure that South Africa has an evolving world class science and technology portfolio.

### **Programme 5: Government Sectoral Programmes and Co-ordination**

**Purpose:** Give leadership and provide support to other government departments in sector specific research, development and technology, and directed human capital programmes.

**Measurable objectives:** Build partnerships, programmes and institutional capacity to ensure the appropriate contribution of science and technology within different sectors and synergistically within clusters.

### **Strategic overview and key policy developments: 2001/02 – 2007/08**

Scientific discoveries, which frequently lead to new, marketable technologies, are key long-term drivers of economic development. The concomitant positive socio-economic effects should be an incentive for public and private investment in science and technology.

#### *The new, separate department*

In its first 10 years, the previous Department of Arts, Culture, Science and Technology set up key enabling policies, informed by the national system of innovation (NSI). These form the basis for the current sector-specific strategies in biotechnology, advanced manufacturing technology and IT road-mapping, adopted by Cabinet. Because of its distinct mandate, the Department of Science and Technology was moved from the social services cluster to the economic services and infrastructure cluster (reflected in the change from vote 18 to 31). This is the first ENE submission made by the Department of Science and Technology under a dedicated, separate ministry.

The department continues to develop strategies in new areas of knowledge and technology. During the past six months, strategies for indigenous knowledge, nanotechnology, astronomy and intellectual property derived from publicly funded research, have been developed.

#### *A new strategic management framework*

The department and the innovation environment face many challenges. These include the large drop in spending on research and development in both the public and private sectors, inadequate intellectual property legislation and infrastructure, and fragmented governance structures for research institutions. To address these issues, the department developed a new strategic management framework, which was approved by Cabinet in October 2004. The new framework classifies the technology-related services and research and development activities supported by government into three basic types:

- early stage or highly cross-sectoral generic technology and associated human resources, for which the department takes responsibility
- focused, sectoral and relatively mature technology domains, which are primarily the responsibility of sector-specific departments, with the department's assistance
- standard technology-based services, for which sector-specific departments take responsibility.

The new strategic framework and the change in approach to the publicly funded portion of South Africa's science and technology system have led to a number of concrete organisational and operational changes. These are discussed under the relevant programmes, which have been restructured in line with the new strategic framework.

### *New programmes*

The successes of the department over the past year, including the rollout of technology missions, increased robustness of the national system of innovation, and the biotechnology strategy, are reported on in the relevant sections. Building on the successful rollout of the technology missions specified in the national research and development strategy, new programmes are being set up in nanotechnology, space science, and nuclear technology and science to support South Africa's engagement with hydrogen research.

### *Human resources development*

Human resources development is the main challenge for the progress of South Africa's NSI. To deal with this, centres of excellence in research are being set up, and young researchers are being developed professionally in post-doctoral programmes for South African researchers. Research chairs in strategic areas are to be set up in South African universities, and scientific infrastructure such as scientific laboratories and information technology equipment is to be renewed and extended.

### *Funding and international partnerships*

It is necessary for South Africa to keep abreast of other developing countries' levels of investment in science and technology. The intermediate goal of 1 per cent of GDP dedicated to research and development remains an important indicator. The current level is 0,3 per cent of GDP. A sharper focus on macroeconomic targets, through practical programmes which also develop and retain much needed human resources, is required for long-term success and sustainability.

In 2001/02, foreign funding in South African research had grown to 6 per cent, from negligible levels before 1994. The department and its associated institutions (like the National Research Foundation) are involved in internationally funded global projects, such as the Southern African large telescope and the European Developing Countries Clinical Trials Partnership. The political alliances being forged with the EU, within NEPAD, and in the India-Brazil-South Africa partnership will give global partnerships more momentum.

As part of the Ten Years of Freedom celebrations, the department hosted an international innovation science and technology fair, in November 2004. The fair was an opportunity to showcase innovation and scientific expertise and to encourage research co-operation, business opportunities and science and technology interaction between South Africa, its international partners and scientific institutions.

South Africa hosted and chaired the inaugural NEPAD ministerial conference on science and technology, which adopted a plan of action outlining flagship programmes. As chair of the NEPAD steering committee, South Africa is leading a process to develop the 12 priority areas in the NEPAD science and technology plan of action. Some of the priority areas are: biotechnology and sustainable development; energy technologies; and ICT. For each area, African countries will pool their resources through PPPs to set up networks of centres of excellence. South African research institutions are central in the networks that will drive the programme.

### *Expert service*

Pooling the department's core content and research management expertise will result in a flexible and responsive science and technology expert service. The *Science and Technology Expert Services* programme will provide the expertise and resource base to deliver on NSI initiatives, as well as support leadership and governance functions. The aim is to improve the department's strategic capacity to place science and technology human resources and direct innovation potential in new areas of science and technology and across existing sectors, in partnership with other

government departments and the private sector. The underlying principle is the global nature of science and technology, which gets appropriately applied locally.

## Expenditure estimates

**Table 31.1: Science and Technology**

| Programme   | Expenditure outcome |                  |                     | Adjusted appropriation | Revised estimate | Medium-term expenditure estimate |                  |                  |
|---|---------------------|------------------|---------------------|------------------------|------------------|----------------------------------|------------------|------------------|
|   | Audited             | Audited          | Preliminary outcome |                        |                  |                                  |                  |                  |
| R thousand  | 2001/02             | 2002/03          | 2003/04             | 2004/05                |                  | 2005/06                          | 2006/07          | 2007/08          |
| 1. Administration                                   | 25 904              | 45 359           | 55 839              | 60 272                 | 60 272           | 68 836                           | 72 973           | 76 656           |
| 2. Science and Technology Expert Services           | 9 068               | 41 579           | 33 487              | 41 458                 | 41 458           | 41 026                           | 44 464           | 47 663           |
| 3. International Co-operation and Resources         | 15 235              | 30 512           | 40 508              | 46 186                 | 46 186           | 82 711                           | 89 492           | 93 467           |
| 4. Frontier Science and Technology                  | 781 690             | 875 148          | 1 064 822           | 1 170 218              | 1 170 218        | 1 362 077                        | 1 500 826        | 1 726 746        |
| 5. Government Sectoral Programmes and Co-ordination | 172 475             | 107 054          | 194 892             | 312 604                | 312 604          | 431 989                          | 475 637          | 496 028          |
| <b>Total</b>  | <b>1 004 372</b>    | <b>1 099 652</b> | <b>1 389 548</b>    | <b>1 630 738</b>       | <b>1 630 738</b> | <b>1 986 639</b>                 | <b>2 183 392</b> | <b>2 440 560</b> |
| Change to 2004 Budget estimate                      |                     |                  |                     | 354 526                | 354 526          | 471 146                          | 532 265          | 706 877          |

### Economic classification

|  |                  |                  |                  |                  |                  |                  |                  |                  |
|--|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| <b>Current payments</b>                          | <b>42 124</b>    | <b>77 873</b>    | <b>103 539</b>   | <b>134 270</b>   | <b>134 270</b>   | <b>156 607</b>   | <b>164 155</b>   | <b>169 582</b>   |
| Compensation of employees                        | 25 507           | 31 756           | 45 710           | 70 661           | 70 661           | 80 196           | 85 007           | 89 293           |
| Goods and services                               | 16 617           | 46 110           | 57 829           | 63 609           | 63 609           | 76 411           | 79 148           | 80 289           |
| of which:  |                  |                  |                  |                  |                  |                  |                  |                  |
| Communication                                    | 1 163            | 3 229            | 4 048            | 3 559            | 3 559            | 5 216            | 5 548            | 5 627            |
| Consultants and contractors                      | 3 490            | 9 684            | 12 144           | 10 580           | 10 580           | 16 146           | 15 142           | 15 382           |
| Travel and subsistence                           | 4 487            | 12 450           | 15 613           | 13 626           | 13 626           | 20 116           | 21 397           | 21 706           |
| Training and staff development                   | 665              | 1 845            | 2 313            | 2 064            | 2 064            | 4 479            | 4 670            | 4 715            |
| Financial transactions in assets and liabilities | —                | 7                | —                | —                | —                | —                | —                | —                |
| <b>Transfers and subsidies to:</b>               | <b>958 421</b>   | <b>1 017 478</b> | <b>1 282 827</b> | <b>1 495 453</b> | <b>1 495 453</b> | <b>1 829 227</b> | <b>2 018 383</b> | <b>2 270 080</b> |
| Provinces and municipalities                     | 85               | 106              | 139              | 220              | 220              | 229              | 243              | 255              |
| Departmental agencies and accounts               | 792 346          | 780 580          | 921 873          | 1 050 675        | 1 050 675        | 1 270 794        | 1 378 670        | 1 444 837        |
| Non-profit institutions                          | 125 846          | 161 963          | 181 066          | 184 677          | 184 677          | 201 554          | 214 601          | 232 001          |
| Households                                       | 40 144           | 74 829           | 179 749          | 259 881          | 259 881          | 356 650          | 424 869          | 592 987          |
| <b>Payments for capital assets</b>               | <b>3 827</b>     | <b>4 301</b>     | <b>3 182</b>     | <b>1 015</b>     | <b>1 015</b>     | <b>805</b>       | <b>854</b>       | <b>898</b>       |
| Machinery and equipment                          | 3 827            | 4 301            | 3 182            | 1 015            | 1 015            | 805              | 854              | 898              |
| <b>Total</b>                                     | <b>1 004 372</b> | <b>1 099 652</b> | <b>1 389 548</b> | <b>1 630 738</b> | <b>1 630 738</b> | <b>1 986 639</b> | <b>2 183 392</b> | <b>2 440 560</b> |

## Expenditure trends

Expenditure is expected to continue to increase rapidly, rising from R1,0 billion in 2001/02 to an expected R2,4 billion in 2007/08, an annual average increase of 15,9 per cent. Most of this expenditure is made up of transfers, and these are driving the increase in allocations.

The expenditure increases over the next three years will go towards increasing capacity, and in particular for frontier programmes, the reprioritisation of the Innovation Fund to focus it on near-market industry programmes, and the strengthening of human capital programmes.

The 2005 Budget set out additional allocations of R97 million in 2005/06, R130 million in 2006/07 and R286,6 million in 2007/08 for human resource development, research and development infrastructure, the ICR leveraging fund and for VAT amendments to several public entities.

## The science vote

The science vote is a virtual vote, aggregated from a range of governmental science and technology institutions and programmes, based on the governance dispensation that prevailed until the recent Cabinet endorsement of a new multi-year national science and technology expenditure plan. The plan will be constructed by the department in consultation with National Treasury.

The indicative science vote is presented for the last time in table 31.8. The major changes are influenced by the third year of the national research and development strategy public finance improvements, a significant portion of which were deployed in core budgets of science vote institutions. The adjustments have given these institutions the capacity to transform established staff complements and their level of innovation in a period where contract income has become more and more important to ensure ongoing linkage to stakeholders. This reinvestment by the department is complemented by ring-fenced items in these budgets to ensure that specific programmes (now often called centres of excellence and frontier programmes) receive priority in the national system of innovation.

## 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**

|  | Receipts outcome |           |                     | Adjusted appropriation | Medium-term receipts estimate |           |           |
|--|------------------|-----------|---------------------|------------------------|-------------------------------|-----------|-----------|
|  | Audited          | Audited   | Preliminary outcome |                        |                               |           |           |
|  | 2001/02          | 2002/03   | 2003/04             |                        | 2004/05                       | 2005/06   | 2006/07   |
| R thousand   |                  |           |                     |                        |                               |           |           |
| Sales of goods and services produced by department | –                | 6         | 1                   | 13                     | 15                            | 17        | 19        |
| Interest, dividends and rent on land               | –                | –         | 1                   | 6                      | 6                             | 6         | 7         |
| Financial transactions in assets and liabilities   | –                | 4         | 1                   | 2                      | 2                             | 2         | 3         |
| <b>Total</b>                                       | <b>–</b>         | <b>10</b> | <b>3</b>            | <b>21</b>              | <b>23</b>                     | <b>25</b> | <b>29</b> |

## Programme 1: Administration

*Administration* provides support and governance functions across the department and the broader science and technology system, and services to political principals focused on the implementation of the national research and development strategy. The programme provides for the minister, the deputy minister and top management. It is responsible for finance, communications, human resources management, legal services, IT systems and support, and internal auditing. It also ensures that funded organisations comply with good corporate governance practices and their alignment with the strategic focus of the national system of innovation. It is responsible for monitoring and evaluating the performance of science councils.

## Expenditure estimates

Table 31.3: Administration

| Subprogramme                   | Expenditure outcome |               |                     | Adjusted appropriation | Medium-term expenditure estimate |               |               |
|--------------------------------|---------------------|---------------|---------------------|------------------------|----------------------------------|---------------|---------------|
|                                | Audited             | Audited       | Preliminary outcome |                        |                                  |               |               |
| R thousand                     | 2001/02             | 2002/03       | 2003/04             | 2004/05                | 2005/06                          | 2006/07       | 2007/08       |
| Minister <sup>1</sup>          | 753                 | 685           | 746                 | 791                    | 843                              | 898           | 943           |
| Deputy Minister <sup>2</sup>   | 622                 | 1 024         | 607                 | 643                    | 685                              | 730           | 766           |
| Management                     | 4 875               | 5 757         | 3 808               | 3 690                  | 3 912                            | 4 147         | 4 354         |
| Corporate Services             | 18 428              | 36 593        | 49 300              | 53 687                 | 60 874                           | 64 525        | 67 786        |
| Governance                     | 1 226               | 1 300         | 1 378               | 1 461                  | 2 522                            | 2 673         | 2 807         |
| <b>Total</b>                   | <b>25 904</b>       | <b>45 359</b> | <b>55 839</b>       | <b>60 272</b>          | <b>68 836</b>                    | <b>72 973</b> | <b>76 656</b> |
| Change to 2004 Budget estimate |                     |               |                     | (649)                  | 3 314                            | 1 761         | 1 883         |

<sup>1</sup> Payable as from 1 April 2004. Salary: R633 061. Car allowance: R158 265.

<sup>2</sup> Payable as from 1 April 2004. Salary: R514 537. Car allowance: R128 634.

### Economic classification

|  |               |               |               |               |               |               |               |
|--|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| <b>Current payments</b>                          | <b>23 903</b> | <b>42 526</b> | <b>53 578</b> | <b>59 686</b> | <b>68 454</b> | <b>72 569</b> | <b>76 232</b> |
| Compensation of employees                        | 16 630        | 21 125        | 26 295        | 35 394        | 35 726        | 37 869        | 39 797        |
| Goods and services                               | 7 273         | 21 394        | 27 283        | 24 292        | 32 728        | 34 700        | 36 435        |
| of which:  |               |               |               |               |               |               |               |
| Communication                                    | 509           | 1 498         | 1 910         | 2 246         | 2 291         | 2 429         | 2 550         |
| Consultants and contractors                      | 1 527         | 4 493         | 5 729         | 6 739         | 6 873         | 7 287         | 7 651         |
| Travel and subsistence                           | 1 964         | 5 776         | 7 366         | 8 665         | 8 837         | 9 369         | 9 837         |
| Training and staff development                   | 291           | 856           | 1 091         | 1 284         | 1 309         | 1 388         | 1 457         |
| Financial transactions in assets and liabilities | –             | 7             | –             | –             | –             | –             | –             |
| <b>Transfers and subsidies to:</b>               | <b>56</b>     | <b>70</b>     | <b>88</b>     | <b>102</b>    | <b>82</b>     | <b>86</b>     | <b>90</b>     |
| Provinces and municipalities                     | 56            | 70            | 88            | 102           | 82            | 86            | 90            |
| <b>Payments for capital assets</b>               | <b>1 945</b>  | <b>2 763</b>  | <b>2 173</b>  | <b>484</b>    | <b>300</b>    | <b>318</b>    | <b>334</b>    |
| Machinery and equipment                          | 1 945         | 2 763         | 2 173         | 484           | 300           | 318           | 334           |
| <b>Total</b>                                     | <b>25 904</b> | <b>45 359</b> | <b>55 839</b> | <b>60 272</b> | <b>68 836</b> | <b>72 973</b> | <b>76 656</b> |

## Expenditure trends

*Administration* expenditure in the four-year period from 2001/02 to 2004/05 increased rapidly at an annual average rate of 32,5 per cent, rising from R25,9 million in 2001/02 to R60,3 million in 2004/05. The increase mainly reflects an expansion of administrative capacity. Expenditure over the next three years increases steadily at an annual average rate of 8,3 per cent, to reach R76,7 million in 2007/08.

## Programme 2: Science and Technology Expert Services

The role of *Science and Technology Expert Services* is to support the department by providing expert services in science and technology policy, implementation, monitoring and reviewing initiatives.

There are two subprogrammes:

- *Expert Services* provides content-based services to the line programmes in support of the department's strategic priorities, carries out initiatives as commissioned by the executive committee, and deals with ad hoc requests. The subprogramme maintains a strategic set of core

skills in the department while using a network of specialists and service providers to complement and enhance its core competences.

- *National Advisory Council on Innovation* provides policy advice to the Minister of Science and Technology on the role and contribution of innovation in promoting and achieving national objectives. These national objectives include improving the quality of life of South Africans and promoting sustainable economic growth and international competitiveness.

## Expenditure estimates

**Table 31.4: Science and Technology Expert Services**

| Subprogramme                            | Expenditure outcome |               |                     | Adjusted appropriation | Medium-term expenditure estimate |               |               |
|---|---------------------|---------------|---------------------|------------------------|----------------------------------|---------------|---------------|
|   | Audited             | Audited       | Preliminary outcome |                        |                                  |               |               |
| R thousand                              | 2001/02             | 2002/03       | 2003/04             | 2004/05                | 2005/06                          | 2006/07       | 2007/08       |
| Expert Services                         | 6 458               | 41 579        | 28 029              | 34 958                 | 32 798                           | 35 742        | 38 505        |
| National Advisory Council on Innovation | 2 610               | –             | 5 458               | 6 500                  | 8 228                            | 8 722         | 9 158         |
| <b>Total</b>                            | <b>9 068</b>        | <b>41 579</b> | <b>33 487</b>       | <b>41 458</b>          | <b>41 026</b>                    | <b>44 464</b> | <b>47 663</b> |
| Change to 2004 Budget estimate          |                     |               |                     | (222 839)              | (257 660)                        | (276 444)     | (289 290)     |

### Economic classification

|                                    |              |               |               |               |               |               |               |
|------------------------------------|--------------|---------------|---------------|---------------|---------------|---------------|---------------|
| <b>Current payments</b>            | <b>8 431</b> | <b>17 015</b> | <b>21 385</b> | <b>32 768</b> | <b>33 922</b> | <b>36 013</b> | <b>37 739</b> |
| Compensation of employees          | 3 455        | 4 872         | 7 966         | 16 443        | 21 120        | 22 387        | 23 507        |
| Goods and services                 | 4 976        | 12 143        | 13 419        | 16 325        | 12 802        | 13 626        | 14 232        |
| of which:                          |              |               |               |               |               |               |               |
| Consultants and contractors        | 1 045        | 2 550         | 2 818         | 2 378         | 1 205         | 1 379         | 1 507         |
| Travel and subsistence             | 1 344        | 3 279         | 3 623         | 3 058         | 3 477         | 3 701         | 3 866         |
| <b>Transfers and subsidies to:</b> | <b>11</b>    | <b>23 868</b> | <b>11 741</b> | <b>8 458</b>  | <b>6 904</b>  | <b>8 239</b>  | <b>9 701</b>  |
| Provinces and municipalities       | 11           | 17            | 26            | 59            | 77            | 82            | 86            |
| Departmental agencies and accounts | –            | 10 000        | –             | –             | –             | –             | –             |
| Non-profit institutions            | –            | 13 851        | 11 715        | 8 399         | 6 827         | 8 157         | 9 615         |
| <b>Payments for capital assets</b> | <b>626</b>   | <b>696</b>    | <b>361</b>    | <b>232</b>    | <b>200</b>    | <b>212</b>    | <b>223</b>    |
| Machinery and equipment            | 626          | 696           | 361           | 232           | 200           | 212           | 223           |
| <b>Total</b>                       | <b>9 068</b> | <b>41 579</b> | <b>33 487</b> | <b>41 458</b> | <b>41 026</b> | <b>44 464</b> | <b>47 663</b> |

### Details of transfers and subsidies:

|   |          |               |               |              |              |              |              |
|---|----------|---------------|---------------|--------------|--------------|--------------|--------------|
| <b>Departmental agencies and accounts</b>       |          |               |               |              |              |              |              |
| Capital   | –        | 10 000        | –             | –            | –            | –            | –            |
| Grant-In-Aid to Various Institutions            | –        | 10 000        | –             | –            | –            | –            | –            |
| <b>Total departmental agencies and accounts</b> | <b>–</b> | <b>10 000</b> | <b>–</b>      | <b>–</b>     | <b>–</b>     | <b>–</b>     | <b>–</b>     |
| <b>Non-profit institutions</b>                  |          |               |               |              |              |              |              |
| Current   | –        | 13 851        | 11 715        | 8 399        | 6 827        | 8 157        | 9 615        |
| Academy of Science of South Africa              | –        | 1 350         | 2 290         | 2 500        | 2 500        | 3 000        | 3 150        |
| Grant-In-Aid to Various Institutions            | –        | 12 501        | 9 425         | 5 899        | 4 327        | 5 157        | 6 465        |
| <b>Total non-profit institutions</b>            | <b>–</b> | <b>13 851</b> | <b>11 715</b> | <b>8 399</b> | <b>6 827</b> | <b>8 157</b> | <b>9 615</b> |

## Expenditure trends

Expenditure more than quadrupled in 2002/03, increasing from R9,1 million to R41,6 million. This was used to expand capacity, and to implement a grants programme. Expenditure then fell in

2003/04, before rising again in 2004/05. The increase is expected to continue, with expenditure rising from R41,5 million to R47,7 million in 2007/08.

## **Service delivery objectives and indicators**

### **Recent outputs**

The programme has provided management services and content deliverables to a large number of departmental initiatives, including: developing frameworks and strategies, setting up institutions and networks, international collaborations and research. These initiatives are elaborated on under *Programme 4: Frontier Science and Technology* and *Programme 5: Government Sectoral Programmes and Co-ordination*.

Cabinet approved the pebble bed modular reactor (PBMR) human capital, research and innovation frontier programme to build the science base needed to ensure that the PBMR is sustainable in the long term, as a uniquely South African innovation in nuclear technology.

The *National Advisory Council of Innovation* subprogramme houses the National Advisory Council on Innovation (NACI) and maintains the Department of Science and Technology's relationship with the Academy of Science of South Africa and the Academy of Engineering. Its functions are reliable policy development and the provision of specialised advice on the national system of innovation. NACI develops science and technology indicators and houses the Reference Group for South African Women in Science and the Biotechnology Advisory Committee.

Over the past three years, NACI has: made critical inputs into the allocation of resources in the national system for innovation and the shape and form of the national research and development strategy; co-ordinated the process that led to the advanced manufacturing technology strategy; and developed South Africa's policy on open source information technologies. Within NACI, key studies have been completed on: science and technology resources in the higher education system; the mobility of science and technology workers internationally and across science areas; and research and development indicators, including the research and development survey of the Department of Science and Technology (which Statistics South Africa has accepted as part of the national statistical system). NACI, the Reference Group for South African Women in Science and the department jointly published a major baseline study on the gender profile and policies of the NSI.

The Academy of Science of South Africa has taken over the publication of the South African Journal of Science, whose impact as a national journal has improved. The academy also launched Quest, a general science periodical aimed at scientifically literate readers.

The legislation being drafted for setting up the Academy of Engineering will strengthen the quality of advice on engineering issues and innovation, and support the development of a modern academy system in South Africa.



## Selected medium-term output targets

### Science and Technology Expert Services

**Measurable objective:** Deliver required outcomes within the strategic themes and portfolio of the department to give effect to the strategy and mandate of the NSI.

| Subprogramme    | Output  | Measure/Indicator  | Target  |
|-----------------|---|--|---|
| Expert Services | Provide analytical support and services to political principals and department's executive  | Policy responses, speeches, and briefing notes provided timeously and effectively  | Timeous response that meets the brief                       |
|                 | System of strategic intelligence knowledge and information (capacity, expertise, foresight, technology roadmaps, indicators, scenarios, best practice and benchmarking) | Number of reports and knowledge transfer events delivered with stakeholder support | Two reports by 2007 and rated by the users of the programme |

## Programme 3: International Co-operation and Resources

Through its three subprogrammes, *International Co-operation and Resources* develops bilateral, and multilateral co-operation agreements in science and technology to strengthen the national system of innovation and to make sure there is a net flow of knowledge, capacity and resources into South Africa and Africa.

- *Multilaterals and Africa* co-ordinates and manages South Africa's participation in international science and technology platforms at sub-regional (SADC), continental (Africa) and global levels. The subprogramme is responsible for funding the Africa Institute of South Africa and for giving financial support to various institutions in support of international science programmes, referred to as global science
- *International Resources* gives assistance, both nationally and for Africa, in accessing international resources for science and technology through both official development assistance and strategic partnerships
- *Bilateral Co-operation* is responsible for all South Africa's country-to-country engagements on science and technology outside Africa.

## Expenditure estimates

Table 31.5: International Co-operation and Resources

| Subprogramme                   | Expenditure outcome |               |                     | Adjusted appropriation | Medium-term expenditure estimate |               |               |
|--------------------------------|---------------------|---------------|---------------------|------------------------|----------------------------------|---------------|---------------|
|                                | Audited             | Audited       | Preliminary outcome |                        |                                  |               |               |
| R thousand                     | 2001/02             | 2002/03       | 2003/04             | 2004/05                | 2005/06                          | 2006/07       | 2007/08       |
| Multilaterals and Africa       | 12 192              | 24 418        | 27 554              | 40 031                 | 40 398                           | 42 309        | 43 924        |
| International Resources        | –                   | –             | 4 864               | 6 155                  | 26 305                           | 29 791        | 31 281        |
| Bilateral Co-operation         | 3 043               | 6 094         | 8 090               | –                      | 16 008                           | 17 392        | 18 262        |
| <b>Total</b>                   | <b>15 235</b>       | <b>30 512</b> | <b>40 508</b>       | <b>46 186</b>          | <b>82 711</b>                    | <b>89 492</b> | <b>93 467</b> |
| Change to 2004 Budget estimate |                     |               |                     | –                      | 7 588                            | 7 499         | 7 374         |

|   | Expenditure outcome |               |                     | Adjusted appropriation | Medium-term expenditure estimate |               |               |
|---|---------------------|---------------|---------------------|------------------------|----------------------------------|---------------|---------------|
|   | Audited             | Audited       | Preliminary outcome |                        |                                  |               |               |
| R thousand                                      | 2001/02             | 2002/03       | 2003/04             | 2004/05                | 2005/06                          | 2006/07       | 2007/08       |
| <b>Economic classification</b>                  |                     |               |                     |                        |                                  |               |               |
| <b>Current payments</b>                         | <b>6 172</b>        | <b>9 371</b>  | <b>20 474</b>       | <b>24 711</b>          | <b>35 901</b>                    | <b>38 264</b> | <b>37 435</b> |
| Compensation of employees                       | 3 781               | 3 001         | 7 899               | 10 361                 | 13 500                           | 14 310        | 15 026        |
| Goods and services                              | 2 391               | 6 370         | 12 575              | 14 350                 | 22 401                           | 23 954        | 22 409        |
| of which:                                       |                     |               |                     |                        |                                  |               |               |
| Communication                                   | 167                 | 446           | 880                 | 162                    | 1 568                            | 1 677         | 1 569         |
| Consultants and contractors                     | 502                 | 1 338         | 2 641               | 486                    | 4 704                            | 5 030         | 4 706         |
| Travel and subsistence                          | 646                 | 1 720         | 3 395               | 625                    | 6 048                            | 6 468         | 6 051         |
| <b>Transfers and subsidies to:</b>              | <b>8 191</b>        | <b>20 678</b> | <b>19 625</b>       | <b>21 325</b>          | <b>46 680</b>                    | <b>51 090</b> | <b>55 886</b> |
| Provinces and municipalities                    | 13                  | 10            | 11                  | 35                     | 36                               | 39            | 42            |
| Departmental agencies and accounts              | 8 178               | 8 981         | 11 713              | 16 325                 | 18 514                           | 21 500        | 22 576        |
| Non-profit institutions                         | –                   | 11 687        | 7 901               | 4 965                  | 28 130                           | 29 551        | 33 268        |
| <b>Payments for capital assets</b>              | <b>872</b>          | <b>463</b>    | <b>409</b>          | <b>150</b>             | <b>130</b>                       | <b>138</b>    | <b>146</b>    |
| Machinery and equipment                         | 872                 | 463           | 409                 | 150                    | 130                              | 138           | 146           |
| <b>Total</b>                                    | <b>15 235</b>       | <b>30 512</b> | <b>40 508</b>       | <b>46 186</b>          | <b>82 711</b>                    | <b>89 492</b> | <b>93 467</b> |
| <b>Details of transfers and subsidies:</b>      |                     |               |                     |                        |                                  |               |               |
| <b>Departmental agencies and accounts</b>       |                     |               |                     |                        |                                  |               |               |
| <b>Current</b>                                  | <b>8 178</b>        | <b>8 981</b>  | <b>11 713</b>       | <b>16 325</b>          | <b>18 514</b>                    | <b>21 500</b> | <b>22 576</b> |
| Africa Institute of South Africa                | 8 178               | 8 981         | 11 713              | 16 325                 | 18 514                           | 21 500        | 22 576        |
| <b>Total departmental agencies and accounts</b> | <b>8 178</b>        | <b>8 981</b>  | <b>11 713</b>       | <b>16 325</b>          | <b>18 514</b>                    | <b>21 500</b> | <b>22 576</b> |
| <b>Non-profit institutions</b>                  |                     |               |                     |                        |                                  |               |               |
| <b>Current</b>                                  | <b>–</b>            | <b>11 687</b> | <b>7 901</b>        | <b>4 965</b>           | <b>28 130</b>                    | <b>29 551</b> | <b>33 268</b> |
| Global Science                                  | –                   | 11 687        | 7 901               | 4 965                  | 28 130                           | 29 551        | 33 268        |
| <b>Total non-profit institutions</b>            | <b>–</b>            | <b>11 687</b> | <b>7 901</b>        | <b>4 965</b>           | <b>28 130</b>                    | <b>29 551</b> | <b>33 268</b> |

## Expenditure trends

Expenditure is expected to continue to increase rapidly, rising from R15,2 million in 2001/02 to an expected R93,5 million in 2007/08, an annual average increase of 35,3 per cent. These increases go towards transfer payments for various institutions in support of international science programmes, as well as for the leveraging of international resources through matched payments.

## Service delivery objectives and indicators

### Recent outputs

The department manages 36 signed international bilateral agreements, which have resulted in over 300 research and development projects. In the trilateral consortium between India, Brazil and South Africa, formed in 2003, a science and technology chapter was created in March 2004.

The department has promoted South African participation in strategic multilateral organisations such as the International Centre for Genetic Engineering and Biotechnology (ICGEB), where a number of South Africans have been nominated for key positions, including as the ICGEB's external auditor.

South Africa's participation in international research funding programmes such as the EU's framework programme, has been improved through the network of national contact points. The network has positioned the South African research community well for securing a substantial share of the EU's commitment to allocate at least €285 million of FP6 funding to third country participants (FP6 is the European Community Framework Programme for Research, Technological Development and Demonstration).

A major achievement was the department's successful support of the Medical Research Council's bid to host the African secretariat office of the European Developing Countries Clinical Trials Partnership (EDCTP), a €700 million funding programme that will run over four years. The partnership aims to speed up the development of new interventions for fighting poverty-related communicable diseases, such as HIV and Aids, malaria and tuberculosis.

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

### Selected medium-term output targets

#### International Co-operation and Resources

| <b>Measurable objective:</b> Increase flows of scientific knowledge and resources to South Africa by participating in joint programmes. |   |   |   |
|---|---|---|---|
| <b>Subprogramme</b>   | <b>Output</b>   | <b>Measure/Indicator</b>  | <b>Target</b>   |
| Multilaterals and Africa  | African and multilateral co-operation on science and technology   | Level of participation and, where appropriate, leadership by South Africa in African and global science | Signing and implementation of strategic African bilaterals with outreach in all African regions: 6 new agreements by 2007<br>Operationalise the NEPAD flagship programmes both in SADC and the continent by 2006<br>Launch a global science and technology for sustainable development programme by World Summit on Sustainable Development +5 (2007) |
| International Resources   | Official development assistance (ODA) and other resource flows (such as international research funding) for science and technology in South Africa and Africa | Level of ODA and other resource flows for science and technology  | Double the amount of funds won through leveraging and competitive funds like the EU framework programme within 3 years<br>Operationalise a functional interactive international technology information platform by 2006   |
| Bilateral Co-operation  | Country-to-country co-operation in science and technology outside Africa  | Extent of flow of knowledge, people and skills at a country-to-country level                            | Enhance implementation of existing agreements and conclude new strategic relationships particular among the 'new 10' in Europe, Latin America and Asia, by 2006   |

### Programme 4: Frontier Science and Technology

The *Frontier Science and Technology* programme provides leadership in long-term and cross-cutting research, and human capital development in the national system of innovation.

There are two subprogrammes:

- *Frontier Programmes* focuses on cross-cutting research, development and innovation that will help to make the NSI a world class science and technology resource. The programme focuses on harmonising activities in research, development and innovation in industry, academia and research institutions.

- *Human Capital* focuses on formulating, developing and implementing national programmes aimed at providing knowledge and human capital. Focus areas include astronomy, human palaeontology and indigenous knowledge. Future developments will include establishing research chairs in South African universities in strategic areas, as well as renewing and extending South Africa's scientific infrastructure base.

## Expenditure estimates

**Table 31.6: Frontier Science and Technology**

| Subprogramme                   | Expenditure outcome |                |                     | Adjusted appropriation | Medium-term expenditure estimate |                  |                  |
|--------------------------------|---------------------|----------------|---------------------|------------------------|----------------------------------|------------------|------------------|
|                                | Audited             | Audited        | Preliminary outcome |                        |                                  |                  |                  |
| R thousand                     | 2001/02             | 2002/03        | 2003/04             | 2004/05                | 2005/06                          | 2006/07          | 2007/08          |
| Frontier Programmes            | 429 021             | 482 895        | 652 440             | 677 438                | 785 134                          | 832 794          | 916 312          |
| Human Capital                  | 352 669             | 392 253        | 412 382             | 492 780                | 576 943                          | 668 032          | 810 434          |
| <b>Total</b>                   | <b>781 690</b>      | <b>875 148</b> | <b>1 064 822</b>    | <b>1 170 218</b>       | <b>1 362 077</b>                 | <b>1 500 826</b> | <b>1 726 746</b> |
| Change to 2004 Budget estimate |                     |                |                     | 1 154 021              | 1 345 617                        | 1 483 369        | 1 708 416        |

### Economic classification

|                                    |                |                |                  |                  |                  |                  |                  |
|------------------------------------|----------------|----------------|------------------|------------------|------------------|------------------|------------------|
| <b>Current payments</b>            | <b>1 050</b>   | <b>4 640</b>   | <b>3 602</b>     | <b>9 012</b>     | <b>8 693</b>     | <b>7 094</b>     | <b>7 450</b>     |
| Compensation of employees          | 455            | 1 489          | 1 462            | 4 584            | 4 050            | 4 293            | 4 508            |
| Goods and services                 | 595            | 3 151          | 2 140            | 4 428            | 4 643            | 2 801            | 2 942            |
| of which:                          |                |                |                  |                  |                  |                  |                  |
| Consultants and contractors        | 125            | 662            | 449              | 930              | 2 558            | 592              | 621              |
| Travel and subsistence             | 161            | 851            | 578              | 1 196            | 718              | 761              | 799              |
| <b>Transfers and subsidies to:</b> | <b>780 525</b> | <b>870 318</b> | <b>1 061 138</b> | <b>1 161 119</b> | <b>1 353 384</b> | <b>1 493 732</b> | <b>1 719 296</b> |
| Provinces and municipalities       | 1              | 4              | 5                | 11               | 15               | 16               | 16               |
| Departmental agencies and accounts | 644 534        | 677 060        | 756 704          | 818 114          | 957 022          | 1 027 654        | 1 078 535        |
| Non-profit institutions            | 125 846        | 136 425        | 161 450          | 171 313          | 166 597          | 176 893          | 189 118          |
| Households                         | 10 144         | 56 829         | 142 979          | 171 681          | 229 750          | 289 169          | 451 627          |
| <b>Payments for capital assets</b> | <b>115</b>     | <b>190</b>     | <b>82</b>        | <b>87</b>        | <b>–</b>         | <b>–</b>         | <b>–</b>         |
| Machinery and equipment            | 115            | 190            | 82               | 87               | –                | –                | –                |
| <b>Total</b>                       | <b>781 690</b> | <b>875 148</b> | <b>1 064 822</b> | <b>1 170 218</b> | <b>1 362 077</b> | <b>1 500 826</b> | <b>1 726 746</b> |

### Details of transfers and subsidies:

|  |                |                |                |                |                |                  |                  |
|--|----------------|----------------|----------------|----------------|----------------|------------------|------------------|
| <b>Departmental agencies and accounts</b>        |                |                |                |                |                |                  |                  |
| <b>Current</b>                                   | <b>642 211</b> | <b>660 672</b> | <b>749 863</b> | <b>814 114</b> | <b>952 782</b> | <b>1 023 154</b> | <b>1 073 810</b> |
| Council for Scientific and Industrial Research   | 302 877        | 297 751        | 323 014        | 348 326        | 431 649        | 464 114          | 487 318          |
| National Laser Centre                            | –              | 5 000          | 11 540         | 18 000         | 18 000         | 19 080           | 20 034           |
| National Research Foundation                     | 330 770        | 357 921        | 404 239        | 446 288        | 488 133        | 523 760          | 549 948          |
| Foundation for Education, Science and Technology | 8 564          | –              | –              | –              | –              | –                | –                |
| Centers of Excellence                            | –              | –              | 11 070         | 1 500          | 15 000         | 16 200           | 16 510           |
| <b>Capital</b>                                   | <b>2 323</b>   | <b>16 388</b>  | <b>6 841</b>   | <b>4 000</b>   | <b>4 240</b>   | <b>4 500</b>     | <b>4 725</b>     |
| Centres of Excellence                            | –              | 6 700          | –              | –              | –              | –                | –                |
| National Research Foundation                     | 2 323          | 9 688          | 6 841          | 4 000          | 4 240          | 4 500            | 4 725            |
| <b>Total departmental agencies and accounts</b>  | <b>644 534</b> | <b>677 060</b> | <b>756 704</b> | <b>818 114</b> | <b>957 022</b> | <b>1 027 654</b> | <b>1 078 535</b> |

|   | Expenditure outcome |                |                     | Adjusted appropriation | Medium-term expenditure estimate |                |                |
|---|---------------------|----------------|---------------------|------------------------|----------------------------------|----------------|----------------|
|   | Audited             | Audited        | Preliminary outcome |                        |                                  |                |                |
| R thousand                              | 2001/02             | 2002/03        | 2003/04             | 2004/05                | 2005/06                          | 2006/07        | 2007/08        |
| <b>Non-profit institutions</b>          |                     |                |                     |                        |                                  |                |                |
| <b>Current</b>                          | <b>125 846</b>      | <b>136 425</b> | <b>161 450</b>      | <b>171 313</b>         | <b>166 597</b>                   | <b>176 893</b> | <b>189 118</b> |
| Innovation Fund                         | 125 846             | 136 425        | 161 450             | 171 313                | 121 597                          | 128 193        | 132 818        |
| Square Kilometer Array                  | –                   | –              | –                   | –                      | 8 000                            | 8 000          | 12 000         |
| Frontier Science and Technology         | –                   | –              | –                   | –                      | 37 000                           | 40 700         | 44 300         |
| <b>Total non-profit institutions</b>    | <b>125 846</b>      | <b>136 425</b> | <b>161 450</b>      | <b>171 313</b>         | <b>166 597</b>                   | <b>176 893</b> | <b>189 118</b> |
| <b>Households</b>                       |                     |                |                     |                        |                                  |                |                |
| <b>Other transfers</b>                  |                     |                |                     |                        |                                  |                |                |
| <b>Current</b>                          | <b>10 144</b>       | <b>56 829</b>  | <b>142 979</b>      | <b>171 681</b>         | <b>219 750</b>                   | <b>279 169</b> | <b>401 627</b> |
| Science and Youth                       | 6 644               | 10 829         | 7 294               | 11 000                 | 20 000                           | 20 000         | 22 000         |
| Science Themes                          | 3 500               | 3 500          | 13 983              | 25 681                 | 24 750                           | 50 583         | 53 112         |
| Biotechnology Strategy                  | –                   | 41 850         | 116 001             | 125 000                | 155 000                          | 158 586        | 166 515        |
| Indigenous Knowledge System             | –                   | 650            | 5 701               | 10 000                 | 10 000                           | 10 000         | 10 000         |
| Human Resource Development              | –                   | –              | –                   | –                      | 10 000                           | 40 000         | 150 000        |
| <b>Capital</b>                          | <b>–</b>            | <b>–</b>       | <b>–</b>            | <b>–</b>               | <b>10 000</b>                    | <b>10 000</b>  | <b>50 000</b>  |
| Research and Development Infrastructure | –                   | –              | –                   | –                      | –                                | –              | 39 000         |
| Equipment Placement                     | –                   | –              | –                   | –                      | 10 000                           | 10 000         | 11 000         |
| <b>Total households</b>                 | <b>10 144</b>       | <b>56 829</b>  | <b>142 979</b>      | <b>171 681</b>         | <b>229 750</b>                   | <b>289 169</b> | <b>451 627</b> |

## Expenditure trends

Expenditure is expected to continue to grow rapidly, rising from R781,7 million in 2001/02 to an expected R1,7 billion in 2007/08, an annual average increase of 14,1 per cent. This growth has mainly gone towards the science themes, the biotechnology strategy and new funding for equipment, human resources development and research and development infrastructure.

Future funding increases will allow for the continued growth of science programmes for the establishment of six centres of excellence in universities. Funding has also been provided for the bid for the Square Kilometre Array telescope.

## Service delivery objectives and indicators

### Recent outputs

#### *Space science and technology*

The department has taken the lead in an international process to establish a Global Earth Observation System of Systems, GEOSS, through participation as co-chair of the Group on Earth Observation (GEO). The GEO is a direct response to the outcomes of the World Summit on Sustainable Development and is one of the foremost international partnerships seeking to implement the WSSD's Johannesburg Plan of Implementation. The department also participated in the development of a 10-year implementation plan for GEOSS. The GEO process aims to enable globally co-ordinated earth observations across a number of domains to provide better data, models and decision support for disasters, agriculture, climate, weather, water, health, energy, biodiversity and ecosystems. Next steps for South Africa are the identification of earth observation

elements that will become part of GEOSS and the development of a South African earth observation strategy.

#### *Square Kilometre Array telescope*

As part of its strategy to encourage investment, the department is promoting South Africa as a preferred destination for global science facilities such as the Square Kilometre Array (SKA) radio telescope. In 2003 and 2004, South Africa's bid for this was intensified, and included Southern African partner countries hosting remote stations. The final bid will be submitted in July 2005. A final site has been chosen and an initial description and simulation of the SKA configuration completed. The process for choosing remote sites has been initiated and completed. The political and technical engagement of neighbouring countries about the location of remote sites is under way.

As part of the international collaboration effort, a research and innovation programme to build a new world class radio telescope in South Africa, in support of the core SKA design, has been initiated. This new telescope has a science programme design that is at the cutting edge of modern radio astronomy and is intended to retain our position as a leading country in the bid process.

#### *Deep space array network station*

Cabinet approved that discussions be held with the National Aeronautics and Space Administration (NASA) to explore placing a deep space array network (DSAN) station on one of several possible sites in the Northern Cape. The NASA delegation has visited the sites and is of the opinion that the South African sites are technically better than those of other possible locations. The two contending countries are South Africa and Spain. A Cabinet memorandum is currently being prepared to obtain Cabinet approval that South Africa agrees to host NASA's DSAN at a site in the Northern Cape. A decision on the location of the site will be taken by NASA in late March 2005.

#### *Open source software*

The open source software initiative is driven by the Meraka open source centre at the Council for Scientific and Industrial Research (CSIR), which has been advocating and shaping the potential for South Africa to use and apply open source software. Other projects include: the CSIR's systems migrating to open source software; supporting the Mogalakwena open source centre initiative, a PPP between the Limpopo government and Hewlett Packard; and the mobile technology platforms for rural clinics.

The translate.org.za project has enjoyed much media focus because of the successful launch of OpenOffice in Zulu, Sesotho and Afrikaans. OpenOffice.org is a multiplatform office suite. The project team recently made a presentation at an OpenOffice conference in Germany, sharing experiences in translating OpenOffice.

#### *South African National Research Network*

South African National Research Network (SANReN) is a proposed high speed research network that connects all South African research institutions to others in the world. Part of the development process includes ongoing efforts to reduce the cost of bandwidth. Over 3 000 research and educational institutions in member countries of the EU are connected through an internet network called GÉANT, and South Africa is hoping to connect SANReN to this.

#### *Biotechnology strategy*

All the biotechnology regional innovation centres have been established, the national bio-informatics networks are working and the public understanding of biotechnology programme is

continuing. Allocations have been made to innovation consortia for high-potential bio-technology projects.

#### *Innovation Fund*

The recommendations from the Innovation Fund reviews have been implemented, including making financing available to secure intellectual property rights, open calls for innovation projects and new funding for student innovation initiatives.

#### *Indigenous knowledge systems*

The indigenous knowledge systems policy was recently approved by Cabinet, providing an enabling framework to stimulate and strengthen the contribution of indigenous knowledge to social and economic development in South Africa. A trust fund has been set up and funded, and a workshop with SADC countries held on how to protect indigenous knowledge.

#### *Centres of excellence*

The department's centres of excellence programme was launched in June 2003, with the setting up of six new centres in the South African science system. The centres recognise and reward excellent scientific capacity and productivity, and are good vehicles for developing young science and technology professionals and academics.

#### *Science and youth programmes*

National Science Week was held simultaneously in all nine provinces in May 2004. A publicly consulted policy on the funding of a network of science centres in South Africa was adopted at a national conference in August 2004. Final approval of norms and standards for the network will be sought from Cabinet so that the policy can start being implemented in 2005.

### **Selected medium-term output targets**

#### **Frontier Science and Technology**

**Measurable objective:** Build research, innovation and human capital programmes within the NSI, effectively using the resources of the department. Develop public research institutions to make sure that South Africa has an evolving world class science and technology portfolio.

| Subprogramme        | Output  | Measure/Indicator  | Target  |
|---------------------|---|--|---|
| Frontier Programmes | Progress on current frontier programmes   | Short, medium and long-term outputs and outcomes articulated and measurement indicators identified.<br><br>Finalise nanotechnology strategy  | Measurement indicators, biotechnology integration plans and 3 biotechnology regional innovation centres established by March 2006<br><br>Rollout of the implementation plan of the nanotechnology strategy by March 2006  |
| Human Capital       | Knowledge and human capital resources in support of wealth creation and improved quality of life<br><br><br><br><br><br><br><br><br><br>Coherent approach to science and technology human capital development | Integrated research funding model developed<br><br><br>Expansion of centres of excellence programme<br>Number of research chairs established at universities<br>Establish professional development and research post-doctoral fellows programmes<br><br>Integrated science and technology human capital strategy for the NSI | Definition of research funding framework for bioscience platform completed and ready for funding by January 2006<br><br>3 more centres of excellence established by June 2005<br>20 research chairs established at universities by September 2005<br>By June 2005<br><br>Draft for approval by January 2006<br>Implementation from March 2006 |

## Programme 5: Government Sectoral Programmes and Co-ordination

*Government Sectoral Programmes and Co-ordination* aims to lead and give support to other government departments in sector-specific research and development, technology and directed human capital programmes.

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.
- *Science and Technology for Social Impact* leads and supports a number of strategic science and technology interventions requiring interdepartmental co-operation for extending scientific research and technology to address identified priorities in different sectors and those expressed in the context of the millennium development goals.
- *Sector Research and Development Planning/Co-ordination* supports sector-based departments and institutions to develop five-year research and development plans. It also prepares an annual national science and technology expenditure plan aimed at providing a holistic view of government's total science and technology spending. The annual national science and technology expenditure plan will also improve decision-making on the deployment of all government funds allocated to research and development.

### Expenditure estimates

Table 31.7: Government Sectoral Programmes and Co-ordination

| Subprogramme   | Expenditure outcome |                |                     | Adjusted appropriation | Medium-term expenditure estimate |                |                |
|--|---------------------|----------------|---------------------|------------------------|----------------------------------|----------------|----------------|
|  | Audited             | Audited        | Preliminary outcome |                        |                                  |                |                |
| R thousand   | 2001/02             | 2002/03        | 2003/04             | 2004/05                | 2005/06                          | 2006/07        | 2007/08        |
| Science and Technology for Economic Impact               | 74 180              | 19 530         | 84 516              | 140 292                | 228 789                          | 257 324        | 270 376        |
| Science and Technology for Social Impact                 | 95 919              | 83 957         | 102 230             | 168 066                | 199 503                          | 213 804        | 220 918        |
| Sector Research and Development Planning / Co-ordination | 2 376               | 3 567          | 8 146               | 4 246                  | 3 697                            | 4 509          | 4 734          |
| <b>Total</b>   | <b>172 475</b>      | <b>107 054</b> | <b>194 892</b>      | <b>312 604</b>         | <b>431 989</b>                   | <b>475 637</b> | <b>496 028</b> |
| Change to 2004 Budget estimate                           |                     |                |                     | (576 007)              | (627 713)                        | (683 920)      | (721 507)      |

  

| Economic classification            |                |                |                |                |                |                |                |
|------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| <b>Current payments</b>            | <b>2 568</b>   | <b>4 321</b>   | <b>4 500</b>   | <b>8 093</b>   | <b>9 637</b>   | <b>10 215</b>  | <b>10 726</b>  |
| Compensation of employees          | 1 186          | 1 269          | 2 088          | 3 879          | 5 800          | 6 148          | 6 455          |
| Goods and services                 | 1 382          | 3 052          | 2 412          | 4 214          | 3 837          | 4 067          | 4 271          |
| of which:                          |                |                |                |                |                |                |                |
| Consultants and contractors        | 290            | 641            | 507            | 47             | 806            | 854            | 897            |
| Travel and subsistence             | 373            | 824            | 651            | 82             | 1 036          | 1 098          | 1 153          |
| <b>Transfers and subsidies to:</b> | <b>169 638</b> | <b>102 544</b> | <b>190 235</b> | <b>304 449</b> | <b>422 177</b> | <b>465 236</b> | <b>485 107</b> |
| Provinces and municipalities       | 4              | 5              | 9              | 13             | 19             | 20             | 21             |
| Departmental agencies and accounts | 139 634        | 84 539         | 153 456        | 216 236        | 295 258        | 329 516        | 343 726        |
| Households                         | 30 000         | 18 000         | 36 770         | 88 200         | 126 900        | 135 700        | 141 360        |
| <b>Payments for capital assets</b> | <b>269</b>     | <b>189</b>     | <b>157</b>     | <b>62</b>      | <b>175</b>     | <b>186</b>     | <b>195</b>     |
| Machinery and equipment            | 269            | 189            | 157            | 62             | 175            | 186            | 195            |
| <b>Total</b>                       | <b>172 475</b> | <b>107 054</b> | <b>194 892</b> | <b>312 604</b> | <b>431 989</b> | <b>475 637</b> | <b>496 028</b> |



|   | Expenditure outcome |               |                     | Adjusted appropriation | Medium-term expenditure estimate |                |                |
|---|---------------------|---------------|---------------------|------------------------|----------------------------------|----------------|----------------|
|   | Audited             | Audited       | Preliminary outcome |                        |                                  |                |                |
| R thousand  | 2001/02             | 2002/03       | 2003/04             | 2004/05                | 2005/06                          | 2006/07        | 2007/08        |
| <b>Details of transfers and subsidies:</b>                      |                     |               |                     |                        |                                  |                |                |
| <b>Departmental agencies and accounts</b>                       |                     |               |                     |                        |                                  |                |                |
| <b>Current</b>  | <b>139 634</b>      | <b>84 539</b> | <b>153 456</b>      | <b>216 236</b>         | <b>295 258</b>                   | <b>329 516</b> | <b>343 726</b> |
| Technology Planning and Diffusion                               | 74 142              | 19 452        | 46 176              | 47 900                 | 83 300                           | 88 058         | 95 486         |
| CSIR: Learnership   | –                   | –             | –                   | 4 000                  | 5 000                            | 6 000          | 6 300          |
| CSIR: Advanced Manufacturing Technology Strategy                | –                   | –             | 2 750               | 21 000                 | 31 500                           | 31 800         | 33 400         |
| National Energy Research Institution                            | –                   | –             | –                   | 10 000                 | 20 000                           | 40 000         | 42 000         |
| Agricultural Research Council: Public Assets                    | –                   | –             | 30 000              | 35 000                 | 43 000                           | 43 000         | 43 000         |
| Medical Research Council: South African Aids Vaccine Initiative | –                   | –             | –                   | 15 000                 | 20 000                           | 15 000         | 15 750         |
| Human Science Research Council                                  | 65 492              | 65 087        | 70 030              | 83 336                 | 91 958                           | 104 538        | 106 614        |
| Indicators  | –                   | –             | 4 500               | –                      | 500                              | 1 120          | 1 176          |
| <b>Total departmental agencies and accounts</b>                 | <b>139 634</b>      | <b>84 539</b> | <b>153 456</b>      | <b>216 236</b>         | <b>295 258</b>                   | <b>329 516</b> | <b>343 726</b> |
| <b>Households</b>   |                     |               |                     |                        |                                  |                |                |
| <b>Other transfers</b>  |                     |               |                     |                        |                                  |                |                |
| <b>Current</b>  | <b>30 000</b>       | <b>18 000</b> | <b>36 770</b>       | <b>88 200</b>          | <b>126 900</b>                   | <b>135 700</b> | <b>141 360</b> |
| Information Communication Technology                            | –                   | –             | 4 856               | 9 000                  | 14 000                           | 14 200         | 14 210         |
| Natural Resources   | –                   | –             | 650                 | 10 000                 | 28 000                           | 30 000         | 31 500         |
| Technology for Poverty Alleviation                              | –                   | –             | 9 263               | 24 200                 | 37 900                           | 38 500         | 40 000         |
| Technology for Sustainable Livelihoods                          | 30 000              | 18 000        | 22 001              | 45 000                 | 47 000                           | 53 000         | 55 650         |
| <b>Total households</b>   | <b>30 000</b>       | <b>18 000</b> | <b>36 770</b>       | <b>88 200</b>          | <b>126 900</b>                   | <b>135 700</b> | <b>141 360</b> |

## Expenditure trends

Expenditure increased rapidly over the last four years, rising from R172,5 million in 2001/02 to R312,6 million in 2004/05, an annual average increase of 21,9 per cent. This rapid growth is expected to continue, with expenditure reaching R496 million in 2007/08.

The future growth in expenditure reflects an increased commitment to the research programmes of the Human Sciences Research Council and investments in technology applications that have the potential to address the millennium development goals for poverty reduction and access to basic services.

## Service delivery objectives and indicators

### Recent outputs

#### *Bio fuels*

The bio fuels initiative is being driven by the Department of Science and Technology and the Department of Minerals and Energy. (Organic matter can be converted directly into liquid fuels called bio fuels. The two most common bio fuels are ethanol and bio diesel.) Joint projects on bio fuels, for example the biodiesel/bioethanol initiative to provide opportunities to enhance the value chain at farming level for economic empowerment, are undertaken by both departments.

### *Co-operative relationships*

The department established the Godisa Trust, which funds technology centres that support newly created SMMEs. The trust gets funding from the Department of Trade and Industry and the Department of Science and Technology. To date Godisa has supported 1 280 SMMEs.

The Tshumisano Trust, a joint venture between government, the German Agency for Technical Co-operation and the Committee of Technikon Principals, is already generating stronger working relationships between the Department of Science and Technology and the Department of Labour. The Tshumisano technology stations offer support to South African enterprises for technology transfer and innovation. There are strong indicators that students involved in work programmes at the Tshumisano stations get successfully placed, because their studies generally require some period of experiential training. During 2003/04, 67 students gained practical exposure to real industry challenges.

The department also has a co-operative development agreement with the Department of Environmental Affairs and Tourism on biodiversity research and information management, flowing directly from the department's successful establishment of the South African Biodiversity Information Facility.

### *Poverty reduction*

Poverty reduction development initiatives are concentrated in the nodes of the integrated sustainable rural development strategy and provided over 5 000 permanent and more temporary job opportunities by the end of 2003/04. ICT and investment in the form of social infrastructure capital were provided to the multipurpose community centres and municipalities in the Eastern Cape, Gauteng and the Free State. Other interventions involved using labour-intensive technologies in construction as part of the expanded public works programme.

### *Integrated planning*

With the implementation of the new strategic management model for government's science and technology system, one of the major recommendations is to fundamentally re-engineer the science vote and develop an annual science and technology expenditure plan as envisaged in the White Paper on Science and Technology. The integrated expenditure plan will be aligned to the re-grouping of public research and development entities, as recommended in the recent governance review of public entities by the National Treasury. A first step towards a holistic view on science and technology was Cabinet's approval of the national research and development strategy and the science and technology strategic management model which mandated the Department of Science and Technology to help other departments with the development of research and development plans (or research and technology plans).

## Selected medium-term output targets

## Government Sectoral Programmes and Co-ordination

**Measurable objective:** Build partnerships, programmes and institutional capacity to ensure the appropriate contribution of science and technology within different sectors and synergistically within clusters.

| Subprogramme                               | Output   | Measure/Indicator  | Target  |
|--|--|--|---|
| Science and Technology for Economic Impact | <p>Strategic government partnerships and directed science, engineering and technology programmes demonstrating potential for positive economic results</p> <p>Science, engineering and technology human capital development</p>  | <p>Strategy agreements established</p> <p>Structured plans and programmes of action for science, engineering and technology contributions to provincial growth and development plans</p> <p>Extent of learning, training and internship opportunities created (levels 2– 8)</p>  | <p>5 sector technology briefs by end 2005</p> <p>Launch first round of energy research projects in 2005</p> <p>Working agreements between departments by March 2006</p> <p>Analysis and support on science and technology planning to 4 low GDP provinces in preparation for budget plans by August 2005</p> <p>Thereafter remaining provinces</p> <p>50% growth in NISL and the SMME internship and training programmes</p> <p>Establishment of 2 sector-specific, work-integrated training institutions</p>   |
| Science and Technology for Social Impact   | <p>Strategic government partnerships and directed science, engineering and technology programmes demonstrating potential for positive service delivery results within the social and justice, crime prevention and security sectors</p> <p>Research on social cohesion and integration as a service to all government departments and science councils</p> <p>Identification and dissemination of poverty reduction technologies designed to improve sustainable livelihoods</p> | <p>Strategy agreements established</p> <p>Ongoing applied social research and policy research initiatives</p> <p>Established initiatives that address the impact of HIV and Aids and related health issues</p> <p>Transferred technologies to community-based projects to reduce poverty and create jobs as well as increased impact of technologies used in poverty reduction</p> | <p>Working agreements with half the social cluster departments by March 2006</p> <p>Working agreements with half the JCPS cluster departments by March 2006</p> <p>Reports of the work conducted on behalf of the department and co-ordination of at least 1 research project on science and technology best practice</p> <p>One community-based factory that produces immune-modulators by end of 2005</p> <p>Participate in the activities of the South African Aids Vaccine Initiative</p> <p>Joint projects with government departments and municipalities on poverty reduction</p> <p>Consolidation of current poverty reduction projects to create sustainability and establish exit strategies by March 2007</p> <p>Completion of draft poverty reduction policy guidelines by end of 2005.</p> <p>Establishment of a monitoring and evaluation system for poverty reduction projects by end of 2005</p> |

| Subprogramme   | Output  | Measure/Indicator  | Target  |
|--|---|--|---|
| Sector Research and Development Planning/Co-ordination | Science and technology expenditure plan   | Publish government science and technology expenditure plan   | 2006 budgeting cycle                                    |
|  |   | Science and technology investment management system accessible to all public research and development institutions and users | 2007 budgeting cycle                                    |
|  | Effective planning and efficient investment on research and development by government departments                           | Research and development plans and strategies approved by Cabinet  | Selected government departments between 2005 and 2007   |
|  | Effective partnerships with sector specific institutions to expand their research and development and innovation programmes | Funded customised research and technology development programmes that are funded   | Research and development institutions across the system |

## Entities and instruments represented in the science vote

While each of the science councils in the science vote reports to different ministries, the Department of Science and Technology and the National Advisory Council on Innovation (NACI) consider the individual budget submissions and subsequent allocations in an integrated manner. Below is a table indicating all the transfer payments to the science councils.

**Table 31.8: Summary of allocations to the science councils**

| Science Council   | Department             | Medium-term expenditure estimate |                  |                  |
|---|------------------------|----------------------------------|------------------|------------------|
|   |                        | 2005/06                          | 2006/07          | 2007/08          |
| R thousand  |                        |                                  |                  |                  |
| South African Bureau of Standards                         | Trade and Industry     | 102 484                          | 111 445          | 117 018          |
| Council for Minerals Technology                           | Minerals and Energy    | 108 879                          | 118 664          | 124 569          |
| Council for Geoscience                                    | Minerals and Energy    | 86 078                           | 93 099           | 97 754           |
| Agricultural Research Council                             | Agriculture            | 333 317                          | 361 943          | 380 039          |
| Medical Research Council                                  | Health                 | 164 304                          | 180 222          | 189 233          |
| Council for Scientific and Industrial Research            | Science and Technology | 431 649                          | 464 114          | 487 318          |
| Human Science Research Council                            | Science and Technology | 84 458                           | 97 038           | 101 889          |
| National Research Foundation                              | Science and Technology | 477 373                          | 513 260          | 538 923          |
| Africa Institute of South Africa                          | Science and Technology | 18 514                           | 21 500           | 22 576           |
| Innovation Fund   | Science and Technology | 186 597                          | 198 493          | 208 418          |
|   |                        | 1 993 653                        | 2 159 778        | 2 267 737        |
| National Research and Development Strategy Implementation |                        | 393 951                          | 446 508          | 619 433          |
| National Energy Research Institute                        |                        | 20 000                           | 40 000           | 42 000           |
| <b>Total</b>  |                        | <b>2 407 604</b>                 | <b>2 646 286</b> | <b>2 929 170</b> |

## Public entities reporting to the Minister

### Human Sciences Research Council

The Human Sciences Research Council (HSRC) 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).

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 focal areas covering: technology and education; democracy and governance; integrated rural and regional development; and the social aspects of HIV and Aids and health. The HSRC has made significant contributions to the debate on these topics by:

- playing a leading role in research for The Presidency's review of the last 10 years to help assess the impact of public sector programmes on poverty
- conducting research on the five-year donor funded project, Strategy for the Care of Orphans and Vulnerable Children (OVC), in Botswana, South Africa and Zimbabwe, which will receive additional funding to extend the project to Lesotho, Mozambique and Swaziland
- completing a two-year study on the determinants of the demand and supply of educators in public schools and further education training colleges, which is expected to contribute towards improved planning at the district level
- completing detailed research, undertaken for National Treasury, on the impact of the land reform programme in rural economies.

Future research work for the HSRC 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.

Growth in sales of goods and services outstripped transfers received between 2001/02 and 2004/05, averaging an annual 54,7 per cent and 10,3 per cent respectively. This growth in revenue is an indication of the HSRC's increasing involvement in the private research environment.

**Table 31.9: Financial summary for the Human Sciences Research Council (HSRC)**

|  | Outcome        |                 |                | Estimated outcome | Medium-term estimate |                |                |
|--|----------------|-----------------|----------------|-------------------|----------------------|----------------|----------------|
|  | Audited        | Audited         | Audited        |                   |                      |                |                |
| R thousand   | 2001/02        | 2002/03         | 2003/04        | 2004/05           | 2005/06              | 2006/07        | 2007/08        |
| <b>INCOME STATEMENT SUMMARY</b>                      |                |                 |                |                   |                      |                |                |
| <b>Revenue</b>                                       |                |                 |                |                   |                      |                |                |
| <b>Non-tax revenue</b>                               | <b>39 432</b>  | <b>73 312</b>   | <b>116 233</b> | <b>136 602</b>    | <b>131 331</b>       | <b>137 897</b> | <b>144 792</b> |
| Sale of goods and services other than capital assets | 36 616         | 69 231          | 113 490        | 135 643           | 130 911              | 137 456        | 144 329        |
| Interest   | 2 816          | 4 081           | 2 743          | 959               | 420                  | 441            | 463            |
| <b>Transfers received</b>                            | <b>61 713</b>  | <b>63 505</b>   | <b>70 562</b>  | <b>82 836</b>     | <b>91 958</b>        | <b>104 538</b> | <b>106 614</b> |
| <b>Sale of capital assets</b>                        | <b>58</b>      | <b>20</b>       | <b>358</b>     | <b>-</b>          | <b>-</b>             | <b>-</b>       | <b>-</b>       |
| <b>Total revenue</b>                                 | <b>101 203</b> | <b>136 837</b>  | <b>187 153</b> | <b>219 438</b>    | <b>223 289</b>       | <b>242 435</b> | <b>251 406</b> |
| <b>Expenses</b>                                      |                |                 |                |                   |                      |                |                |
| <b>Current expense</b>                               | <b>92 125</b>  | <b>147 314</b>  | <b>187 363</b> | <b>219 438</b>    | <b>223 289</b>       | <b>242 435</b> | <b>251 406</b> |
| Compensation of employees                            | 37 929         | 64 731          | 83 370         | 92 440            | 94 330               | 99 046         | 103 998        |
| Goods and services                                   | 52 159         | 78 318          | 98 297         | 121 557           | 123 246              | 137 391        | 141 110        |
| Depreciation   | 2 037          | 4 265           | 5 696          | 5 441             | 5 713                | 5 998          | 6 298          |
| <b>Total expenses</b>                                | <b>92 125</b>  | <b>147 314</b>  | <b>187 363</b> | <b>219 438</b>    | <b>223 289</b>       | <b>242 435</b> | <b>251 406</b> |
| <b>Surplus / (Deficit)</b>                           | <b>9 078</b>   | <b>(10 477)</b> | <b>(210)</b>   | <b>-</b>          | <b>-</b>             | <b>-</b>       | <b>-</b>       |

*Data provided by the 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. A Cabinet decision was taken during 2004 to transfer responsibility for the CSIR from the Department of Trade and Industry to the Department of Science and Technology with effect from April 2005. The CSIR will then report to the Minister of Science and Technology.

The CSIR's mandate is to foster industrial and scientific development – either by itself or in partnership with public and private sector institutions – in the national interest, through multidisciplinary research and technological innovation.

In the past year, the CSIR, through its 8 business units, has conducted several research projects. Highlights of the recent outputs include:

- the rolling out of a web-based state of the environment reporting programme, known as Publikit, allowing all provinces and local authorities to compile and maintain their own state of the environment reports
- the development of a manual entitled Knowledge, Attitude and Practices Study for Hygiene Awareness in the Rural Areas of South Africa, for health professionals working in rural areas
- the development of an innovative device, by the mining technology division, to detect the collapse of coalmine roofs and thus contribute to reducing fatalities in coalmines.

The CSIR intends to intensify its efforts in developing biotechnology, particularly plant biotechnology, going forward. The products of this work could yield, for example, new plant varieties and high value chemicals pharmaceuticals, including enzymes.

The main sources of funding for the CSIR are from government transfers and sales revenue. Sales revenue grows at an annual average rate of 5,7 per cent from 2001/02 to 2007/08, compared to 10,7 per cent growth in government transfers over the same period.

**Table 31.10: Financial summary for the Council for Scientific and Industrial Research (CSIR)**

|  | Outcome        |                  |                | Estimated outcome | Medium-term estimate |                  |                  |
|--|----------------|------------------|----------------|-------------------|----------------------|------------------|------------------|
|  | Audited        | Audited          | Audited        |                   |                      |                  |                  |
| R thousand   | 2001/02        | 2002/03          | 2003/04        | 2004/05           | 2005/06              | 2006/07          | 2007/08          |
| <b>INCOME STATEMENT SUMMARY</b>                      |                |                  |                |                   |                      |                  |                  |
| <b>Revenue</b>                                       |                |                  |                |                   |                      |                  |                  |
| <b>Non-tax revenue</b>                               | <b>641 363</b> | <b>701 439</b>   | <b>667 383</b> | <b>789 886</b>    | <b>793 511</b>       | <b>832 242</b>   | <b>881 755</b>   |
| Sale of goods and services other than capital assets | 627 532        | 686 757          | 662 755        | 784 825           | 788 511              | 827 242          | 876 755          |
| Interest   | 14 850         | 14 787           | 14 858         | 9 259             | 9 000                | 9 100            | 9 150            |
| <b>Transfers received</b>                            | <b>296 883</b> | <b>295 429</b>   | <b>321 996</b> | <b>366 326</b>    | <b>484 482</b>       | <b>520 114</b>   | <b>546 112</b>   |
| <b>Sale of capital assets</b>                        | <b>837</b>     | <b>(599)</b>     | <b>(3 961)</b> | <b>–</b>          | <b>–</b>             | <b>–</b>         | <b>–</b>         |
| <b>Total revenue</b>                                 | <b>939 083</b> | <b>996 269</b>   | <b>985 418</b> | <b>1 156 212</b>  | <b>1 277 993</b>     | <b>1 352 356</b> | <b>1 427 867</b> |
| <b>Expenses</b>                                      |                |                  |                |                   |                      |                  |                  |
| <b>Current expense</b>                               | <b>930 782</b> | <b>1 155 900</b> | <b>947 474</b> | <b>1 135 900</b>  | <b>1 198 617</b>     | <b>1 264 827</b> | <b>1 334 724</b> |
| Compensation of employees                            | 465 194        | 669 634          | 517 318        | 592 319           | 627 858              | 665 529          | 705 461          |
| Goods and services                                   | 425 528        | 449 250          | 391 996        | 501 815           | 586 403              | 617 125          | 647 980          |
| Depreciation   | 38 688         | 34 411           | 37 788         | 41 766            | 43 854               | 46 047           | 48 349           |
| Tax and Outside shareholders Interest                | 1 344          | 1 885            | 155            |                   |                      |                  |                  |
| Interest, dividends and rent on land                 | 28             | 720              | 217            | –                 | –                    | –                | –                |
| <b>Total expenses</b>                                | <b>930 782</b> | <b>1 155 900</b> | <b>947 474</b> | <b>1 135 900</b>  | <b>1 258 115</b>     | <b>1 328 701</b> | <b>1 401 790</b> |
| <b>Surplus / (Deficit)</b>                           | <b>8 301</b>   | <b>(159 631)</b> | <b>37 944</b>  | <b>20 312</b>     | <b>19 878</b>        | <b>23 655</b>    | <b>26 077</b>    |

*Data provided by the Council for Scientific and Industrial Research*

## National Research Foundation

As the government's national agency responsible for promoting and supporting research, the National Research Foundation (NRF), established in terms of the National Research Foundation Act (1998), aims to uphold excellence in its investments 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 has successfully addressed many of its research and development strategy imperatives since its establishment, which include science awareness and outreach, student support, scarce skills development and the creation of centres of excellence.

A countrywide survey to provide the first comprehensive fish faunal inventory and distribution has recently been completed. This new knowledge will improve the management of South African beaches and estuaries.

The construction phase of the telescope surface upgrade project was completed in Hartebeesthoek.

Going forward, the NRF intends to:

- establish a space geodetic observatory, which will provide higher quality satellite, lunar and quasar observations in the southern hemisphere
- together with its partner, the Medical Research Council, develop primary healthcare telemedicine workstations, which will transmit medical expertise to rural clinics.

The NRF's main sources of income are government transfers and tendered contract research (other non-tax revenue). Growth in transfers averaged an annual 14,7 per cent between 2001/02 and 2004/05, and is projected at 9,5 per cent over the medium term.

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). The significant increases in goods and services are directly attributable to increases in the allocations for the Innovation Fund. The transfer to the Innovation Fund increased from R125,8 million in 2001/02 to R132,8 million in 2007/08.

**Table 31.11: Financial summary for the National Research Foundation (NRF)**

|  | Outcome        |                |                | Estimated outcome | Medium-term estimate |                |                  |
|--|----------------|----------------|----------------|-------------------|----------------------|----------------|------------------|
|  | Audited        | Audited        | Audited        |                   |                      |                |                  |
| R thousand   | 2001/02        | 2002/03        | 2003/04        | 2004/05           | 2005/06              | 2006/07        | 2007/08          |
| <b>INCOME STATEMENT SUMMARY</b>                      |                |                |                |                   |                      |                |                  |
| <b>Revenue</b>                                       |                |                |                |                   |                      |                |                  |
| <b>Non-tax revenue</b>                               | <b>208 020</b> | <b>289 551</b> | <b>353 850</b> | <b>475 488</b>    | <b>464 488</b>       | <b>422 149</b> | <b>468 445</b>   |
| Sale of goods and services other than capital assets | 188 575        | 266 274        | 330 770        | 455 501           | 444 988              | 402 649        | 448 945          |
| Interest   | 11 980         | 15 143         | 14 560         | 10 987            | 10 000               | 10 000         | 10 000           |
| Other non-tax revenue                                | 7 465          | 8 134          | 8 520          | 9 000             | 9 500                | 9 500          | 9 500            |
| <b>Transfers received</b>                            | <b>290 733</b> | <b>336 431</b> | <b>378 966</b> | <b>439 126</b>    | <b>502 784</b>       | <b>545 124</b> | <b>576 210</b>   |
| <b>Sale of capital assets</b>                        | <b>68</b>      | <b>(167)</b>   | <b>(453)</b>   | <b>–</b>          | <b>–</b>             | <b>–</b>       | <b>–</b>         |
| <b>Total revenue</b>                                 | <b>498 821</b> | <b>625 815</b> | <b>732 363</b> | <b>914 614</b>    | <b>967 272</b>       | <b>967 273</b> | <b>1 044 655</b> |
| <b>Expenses</b>                                      |                |                |                |                   |                      |                |                  |
| <b>Current expense</b>                               | <b>474 981</b> | <b>606 060</b> | <b>736 202</b> | <b>974 064</b>    | <b>967 272</b>       | <b>967 273</b> | <b>1 044 655</b> |
| Compensation of employees                            | 89 585         | 106 942        | 126 330        | 171 630           | 181 928              | 192 843        | 204 414          |
| Goods and services                                   | 376 255        | 484 471        | 592 387        | 783 287           | 764 244              | 752 330        | 818 141          |
| Depreciation   | 9 047          | 14 535         | 17 380         | 19 037            | 21 000               | 22 000         | 22 000           |
| Interest   | 94             | 112            | 105            | 110               | 100                  | 100            | 100              |
| <b>Transfers and subsidies</b>                       |                |                |                |                   |                      |                |                  |
| <b>Total expenses</b>                                | <b>474 981</b> | <b>606 060</b> | <b>736 202</b> | <b>974 064</b>    | <b>967 272</b>       | <b>967 273</b> | <b>1 044 655</b> |
| <b>Surplus / (Deficit)</b>                           | <b>23 840</b>  | <b>19 755</b>  | <b>(3 839)</b> | <b>(59 450)</b>   | <b>–</b>             | <b>–</b>       | <b>–</b>         |

*Data provided by the National Research Foundation*

### **Africa Institute of South Africa**

The Africa Institute of South Africa (AISA) is a statutory body that carries out in-depth analysis of Africa's current affairs and gathers intelligence on the 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 and support policy development; embark on 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.

Transfers received from government totalled R8,2 million in 2001/02 and increase to R22,6 million in 2007/08.

### **Godisa Trust**

Godisa is a Tswana word meaning growth through nurturing. The trust's development programme supports new (0 to 3 years old) SMME in achieving a competitive market position. Enhancing the competitiveness, productivity and sustainability of SMMEs, Godisa aims to promote long-term employment, economic growth and sustainable development.

Godisa runs an incubator programme and innovation and technology demonstration activities co-financed with funding streams from the Department of Trade and Industry, the Department of Science and Technology and the European Union.

During March 2004, the Godisa board of trustees agreed that Godisa's highest priority would be enterprise creation, to be achieved primarily through technology transfer and diffusion, and the promotion of broader processes for supporting and strengthening of small enterprises. This will be followed by the development of Godisa's capacity to become a centre of competence in business incubation, and facilitating access to appropriate resources for the Godisa centres.

### **Tshumisano Trust**

The department has identified technological innovation and related skills upgrading as being of vital importance to the competitiveness of South African SMMEs. Tshumisano operates the technology stations programme with funding from the department and GTZ (Gesellschaft für Technische Zusammenarbeit). Technology stations are developed at technikons, and service SMMEs, and also aim to improve market responsiveness in technikon programmes.

### **Academy of Science of South Africa**

The Academy of Science of South Africa Act (2001) provides for the establishment of the Academy of Science of South Africa (ASSAf). Its objectives are: to promote common ground for scientific thinking across all disciplines; to encourage and promote innovative and independent scientific thinking; to promote the optimum 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 concerning science, and manages South African research journals.

### **National Energy Research Institute**

The establishment of the National Energy Research Institute (NERI) is a joint mandate with the Department of Minerals and Energy. NERI's main focus is to build research capacity through funding research at universities and in science councils.



In 2004/05, 40 per cent of the R10 million transfer was used for the establishment of NERI and the formulation of the national energy research and development strategy, and 60 per cent was spent on flagship research programmes. In June 2004, Cabinet approved the governance model for NERI as a subsidiary of CEF (Pty) Ltd.

## **Annexure**

### **Vote 31: Science and Technology**

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

Table 31.B: Summary of personnel numbers and compensation of employees per programme

Table 31.C: Summary of expenditure on training per programme

Table 31.D: Summary of information and communications technology expenditure per programme

Table 31.E: Summary of official development assistance expenditure

Table 31.F: Summary of expenditure on infrastructure

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

| Programme   | Appropriation    |                  | Preliminary<br>outcome | Appropriation    |                 |                  | Revised<br>estimate |
|---|------------------|------------------|------------------------|------------------|-----------------|------------------|---------------------|
|   | Main             | Adjusted         |                        | Main             | Additional      | Adjusted         |                     |
| R thousand  | 2003/04          |                  |                        | 2004/05          |                 |                  |                     |
| 1. Administration                                   | 30 803           | 53 278           | 55 839                 | 56 072           | 4 200           | 60 272           | 60 272              |
| 2. Science and Technology Expert Services           | 196 937          | 200 547          | 33 487                 | 41 458           | –               | 41 458           | 41 458              |
| 3. International Co-operation and Resources         | 42 714           | 40 535           | 40 508                 | 46 186           | –               | 46 186           | 46 186              |
| 4. Frontier Science and Technology                  | 45 424           | 44 543           | 1 064 822              | 1 168 718        | 1 500           | 1 170 218        | 1 170 218           |
| 5. Government Sectoral Programmes and Co-ordination | 745 123          | 729 368          | 194 892                | 312 104          | 500             | 312 604          | 312 604             |
| <b>Total</b>  | <b>1 061 001</b> | <b>1 068 271</b> | <b>1 389 548</b>       | <b>1 624 538</b> | <b>6 200</b>    | <b>1 630 738</b> | <b>1 630 738</b>    |
| <b>Economic classification</b>                      |                  |                  |                        |                  |                 |                  |                     |
| <b>Current payments</b>                             | <b>75 884</b>    | <b>78 784</b>    | <b>103 539</b>         | <b>109 235</b>   | <b>25 035</b>   | <b>134 270</b>   | <b>134 270</b>      |
| Compensation of employees                           | 62 162           | 52 162           | 45 710                 | 66 461           | 4 200           | 70 661           | 70 661              |
| Goods and services                                  | 13 722           | 26 622           | 57 829                 | 42 774           | 20 835          | 63 609           | 63 609              |
| <b>Transfers and subsidies</b>                      | <b>984 253</b>   | <b>987 523</b>   | <b>1 282 827</b>       | <b>1 514 288</b> | <b>(18 835)</b> | <b>1 495 453</b> | <b>1 495 453</b>    |
| Municipalities                                      | 205              | 205              | 139                    | 220              | –               | 220              | 220                 |
| Departmental agencies and accounts                  | 984 048          | 987 318          | 921 873                | 1 053 675        | (3 000)         | 1 050 675        | 1 050 675           |
| Non-profit institutions                             | –                | –                | 181 066                | 196 712          | (12 035)        | 184 677          | 184 677             |
| Households  | –                | –                | 179 749                | 263 681          | (3 800)         | 259 881          | 259 881             |
| <b>Payments for capital assets</b>                  | <b>864</b>       | <b>1 964</b>     | <b>3 182</b>           | <b>1 015</b>     | <b>–</b>        | <b>1 015</b>     | <b>1 015</b>        |
| Machinery and equipment                             | 864              | 1 964            | 3 182                  | 1 015            | –               | 1 015            | 1 015               |
| Other machinery and equipment                       | 864              | 1 964            | 3 182                  | 1 015            | –               | 1 015            | 1 015               |
| <b>Total</b>  | <b>1 061 001</b> | <b>1 068 271</b> | <b>1 389 548</b>       | <b>1 624 538</b> | <b>6 200</b>    | <b>1 630 738</b> | <b>1 630 738</b>    |

**Table 31.B: Summary of personnel numbers and compensation of employees per programme<sup>1</sup>**

| Programme   | 2001/02    | 2002/03    | 2003/04    | 2004/05    | 2005/06    |
|---|------------|------------|------------|------------|------------|
| 1. Administration                                   | 106        | 147        | 113        | 164        | 132        |
| 2. Science and Technology Expert Services           | 6          | 14         | 49         | 70         | 73         |
| 3. International Co-operation and Resources         | 11         | 28         | 38         | 57         | 49         |
| 4. Frontier Science and Technology                  | 36         | 52         | 12         | 17         | 15         |
| 5. Government Sectoral Programmes and Co-ordination | 5          | 13         | 18         | 26         | 21         |
| <b>Total</b>  | <b>164</b> | <b>254</b> | <b>230</b> | <b>334</b> | <b>290</b> |
| Total personnel cost (R thousand)                   | 25 507     | 31 756     | 45 710     | 70 661     | 80 196     |
| Unit cost (R thousand)                              | 156        | 125        | 199        | 212        | 277        |

<sup>1</sup> Budgeted full-time equivalent

**Table 31.C: Summary of expenditure on training per programme**

| R thousand  | Expenditure outcome |            |                     | Adjusted appropriation | Medium-term expenditure estimate |              |              |
|---|---------------------|------------|---------------------|------------------------|----------------------------------|--------------|--------------|
|   | Audited             | Audited    | Preliminary outcome |                        |                                  |              |              |
|   | 2001/02             | 2002/03    | 2003/04             |                        | 2005/06                          | 2006/07      | 2007/08      |
| 1. Administration                                   | 56                  | 92         | 1 091               | 1 284                  | 1 309                            | 1 388        | 1 457        |
| 2. Science and Technology Expert Services           | 39                  | 53         | 537                 | 453                    | 2 015                            | 2 048        | 2 073        |
| 3. International Co-operation and Resources         | 19                  | 28         | 503                 | 93                     | 896                              | 958          | 896          |
| 4. Frontier Science and Technology                  | 5                   | 14         | 86                  | 177                    | 106                              | 113          | 118          |
| 5. Government Sectoral Programmes and Co-ordination | 11                  | 13         | 96                  | 57                     | 153                              | 163          | 171          |
| <b>Total</b>  | <b>130</b>          | <b>200</b> | <b>2 313</b>        | <b>2 064</b>           | <b>4 479</b>                     | <b>4 670</b> | <b>4 715</b> |

**Table 31.D: Summary of information and communications technology expenditure per programme**

| R thousand   | Expenditure outcome |              |                     | Adjusted appropriation | Medium-term expenditure estimate |              |              |
|--|---------------------|--------------|---------------------|------------------------|----------------------------------|--------------|--------------|
|  | Audited             | Audited      | Preliminary outcome |                        |                                  |              |              |
|  | 2001/02             | 2002/03      | 2003/04             |                        | 2005/06                          | 2006/07      | 2007/08      |
| <b>1. Administration</b>                                   | <b>748</b>          | <b>634</b>   | <b>784</b>          | <b>1 638</b>           | <b>1 670</b>                     | <b>1 475</b> | <b>1 549</b> |
| Technology   | 658                 | 634          | 684                 | 738                    | 738                              | 500          | 525          |
| IT services  | 90                  | —            | 100                 | 900                    | 932                              | 975          | 1 024        |
| <b>2. Science and Technology Expert Services</b>           | <b>254</b>          | <b>393</b>   | <b>524</b>          | <b>457</b>             | <b>457</b>                       | <b>450</b>   | <b>473</b>   |
| Technology   | 254                 | 393          | 424                 | 457                    | 457                              | 450          | 473          |
| IT services  | —                   | —            | 100                 | —                      | —                                | —            | —            |
| <b>3. International Co-operation and Resources</b>         | <b>402</b>          | <b>623</b>   | <b>772</b>          | <b>705</b>             | <b>705</b>                       | <b>700</b>   | <b>735</b>   |
| Technology   | 402                 | 623          | 672                 | 705                    | 705                              | 700          | 735          |
| IT services  | —                   | —            | 100                 | —                      | —                                | —            | —            |
| <b>4. Frontier Science and Technology</b>                  | <b>438</b>          | <b>682</b>   | <b>836</b>          | <b>772</b>             | <b>772</b>                       | <b>400</b>   | <b>420</b>   |
| Technology   | 438                 | 682          | 736                 | 772                    | 772                              | 400          | 420          |
| IT services  | —                   | —            | 100                 | —                      | —                                | —            | —            |
| <b>5. Government Sectoral Programmes and Co-ordination</b> | <b>161</b>          | <b>248</b>   | <b>367</b>          | <b>280</b>             | <b>280</b>                       | <b>350</b>   | <b>368</b>   |
| Technology   | 161                 | 248          | 267                 | 280                    | 280                              | 350          | 368          |
| IT services  | —                   | —            | 100                 | —                      | —                                | —            | —            |
| <b>Total</b>   | <b>2 003</b>        | <b>2 580</b> | <b>3 283</b>        | <b>3 852</b>           | <b>3 884</b>                     | <b>3 375</b> | <b>3 545</b> |

**Table 31.E: Summary of official development assistance expenditure**

| Donor          | Project                           | Cash/<br>kind | Outcome      |               |               |          | Medium-term expenditure estimate |          |          |
|----------------|-----------------------------------|---------------|--------------|---------------|---------------|----------|----------------------------------|----------|----------|
|                |                                   |               | 2001/02      | 2002/03       | 2003/04       |          | 2005/06                          | 2006/07  | 2007/08  |
| Foreign        |                                   |               |              |               |               |          |                                  |          |          |
| European Union | GODISA Programme to support SMMEs |               | 4 044        | 16 091        | 18 580        | —        | —                                | —        | —        |
| <b>Total</b>   |                                   |               | <b>4 044</b> | <b>16 091</b> | <b>18 580</b> | <b>—</b> | <b>—</b>                         | <b>—</b> | <b>—</b> |

**Table 31.F: Summary of expenditure on infrastructure**

| Projects                                | Description                             | Expenditure outcome |         |                     | Adjusted appropriation | Medium-term expenditure estimate |         |               |
|---|---|---------------------|---------|---------------------|------------------------|----------------------------------|---------|---------------|
|   |   | Audited             | Audited | Preliminary outcome |                        |                                  |         |               |
| R thousand                              |   | 2001/02             | 2002/03 | 2003/04             | 2004/05                | 2005/06                          | 2006/07 | 2007/08       |
| <b>Infrastructure transfers</b>         |   |                     |         |                     |                        |                                  |         |               |
| Research and development infrastructure | Research and development infrastructure | –                   | –       | –                   | –                      | –                                | –       | 39 000        |
| <b>Total</b>                            |   | –                   | –       | –                   | –                      | –                                | –       | <b>39 000</b> |

