

Vote 30

Science and Technology

Budget summary

R million	2019/20				2020/21	2021/22
	Total	Current payments	Transfers and subsidies	Payments for capital assets	Total	Total
MTEF allocation						
Administration	380.3	362.5	15.1	2.7	342.9	359.9
Technology Innovation	1 224.3	78.8	1 145.5	–	1 293.2	1 355.0
International Cooperation and Resources	149.0	77.0	72.0	–	158.1	165.0
Research Development and Support	4 572.9	58.6	4 514.4	–	4 900.9	5 155.4
Socioeconomic Innovation Partnerships	1 824.4	58.3	1 766.1	–	1 928.2	1 867.9
Total expenditure estimates	8 151.0	635.3	7 513.0	2.7	8 623.2	8 903.2

Executive authority: Minister of Science and Technology
 Accounting officer: Director-General of Science and Technology
 Website address: www.dst.gov.za

The Estimates of National Expenditure e-publications for individual votes are available on www.treasury.gov.za. These publications provide more comprehensive coverage of vote specific information, particularly about goods and services, transfers and subsidies, personnel, entities, donor funding, public-private partnerships, conditional grants to provinces and municipalities, and expenditure information at the level of service delivery, where appropriate.

Vote purpose

Realise the full potential of science and technology in social and economic development by developing human resources, research and innovation.

Mandate

The Department of Science and Technology derives its mandate from the 1996 White Paper on Science and Technology, which introduced the concept of the national system of innovation, a set of interacting organisations and policies through which the country creates, acquires, diffuses and puts into practice new knowledge to help achieve individual and collective goals. A coordinated and efficient national system of innovation will help South Africa achieve its national development priorities by promoting change through innovation, enabling all South Africans to enjoy the economic, sociopolitical and intellectual benefits of science, technology and innovation.

Selected performance indicators

Table 30.1 Performance indicators by programme and related outcome

Indicator	Programme	MTSF outcome	Past			Current	Projections		
			2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
Number of instruments funded in support of knowledge utilisation per year	Technology Innovation	Outcome 4: Decent employment through inclusive growth	6	25	19	21	21	19 ¹	19 ¹
Number of commercial outputs in designated areas per year ²	Technology Innovation		3	8	4	3	8	3	3
Amount of funds invested by international partners in their own organisations and initiatives targeted at cooperation with South African partners in the areas of research, innovation and science, technology and innovation human capital development, as part of cooperation initiatives implemented by the department per year	International Cooperation and Resources		R2.2m	R1.3bn ³	R1.2bn ³	R280m	R300m	R320m	R320m

Table 30.1 Performance indicators by programme and related outcome

Indicator	Programme	MTSF outcome	Past			Current	Projections		
			2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
Number of doctoral students awarded bursaries per year, as reflected in reports from the National Research Foundation and relevant entities	Research, Development and Support		3 404	3 454	3 621	3 100	3 100	3 100	3 100
Number of pipeline postgraduate students (BTech, honours and masters students) awarded bursaries per year, as reflected in reports from the National Research Foundation and relevant entities	Research, Development and Support	Outcome 5: A skilled and capable workforce to support an inclusive growth path	10 996	10 268	10 601	10 800	10 800	10 800	10 800
Number of researchers awarded research grants per year through programmes managed by the National Research Foundation, as reflected in the foundation's project reports	Research, Development and Support		4 315	4 520	4 707	4 500	4 500	4 500	4 500
Number of knowledge and innovation products (patents, prototypes, technology demonstrators or technology transfer packages) added to the intellectual property portfolio through fully funded or co-funded research initiatives per year	Socioeconomic Innovation Partnerships	Outcome 4: Decent employment through inclusive growth	38	36	38	26	50 ⁴	50 ⁴	50 ⁴

1. Target decreases in line with available budget and an expected decrease in the number of personnel.
2. As commercialisation is difficult to predict, estimates are based on knowledge of projects under way.
3. Between 2016/17 and 2017/18, funding from international partners, particularly the European Union Horizon 2020 programme, was higher. Funding from these sources is expected to decrease over the MTEF period and targets have been revised accordingly.
4. Higher targets have been set against the backdrop of the department exceeding previous targets.

Expenditure analysis

The National Development Plan acknowledges that science, technology and innovation are crucial to enabling broad-based socioeconomic development through a skilled and innovative population. This is expressed in terms of outcome 5 (a skilled and capable workforce to support an inclusive growth path) and outcome 6 (an efficient, competitive and responsive economic infrastructure network) of government's 2014-2019 medium-term strategic framework. The work of the Department of Science and Technology is closely aligned with these outcomes. Accordingly, over the medium term, the department will focus on: producing new knowledge; developing human capital; funding research, innovation and infrastructure; and generating and exploiting knowledge and innovation for inclusive economic development.

As part of government's broader objective to lower national expenditure and reprioritise funds appropriately, Cabinet has approved reductions to the department's baseline budget amounting to R322.8 million over the MTEF period. Nevertheless, the department's overall budget is expected to increase at an average annual rate of 3.8 per cent, from R8.2 billion in 2019/20 to R8.9 billion in 2021/22. Of the department's total budget over the medium term, 92.5 per cent (R23.8 billion) is expected to be transferred to the department's entities. Spending on compensation of employees is expected to increase at an average annual rate of 8.6 per cent, from R339.8 million in 2018/19 to R435 million in 2021/22, with the number of personnel expected to increase from 444 in 2018/19 to 446 in 2021/22.

Producing new knowledge

The department is committed to strengthening research and innovation competencies and programmes that form the strategic foundation for scientific innovation. Accordingly, through funds allocated in the *Technology Innovation* programme, the department plans to invest an estimated 15.1 per cent (R3.9 billion) of its total budget over the medium term towards the production of new knowledge, and the development and commercialisation of technology.

The department's investment in the industrial, health and agricultural sectors, as well as in the development of indigenous knowledge applications, is reflected in an allocation of R616.3 million over the MTEF period in the *Bio-innovation* subprogramme in the *Technology Innovation* programme. This investment will particularly seek to find solutions to the disposal of industrial and municipal waste; facilitate the development of biopharmaceuticals, vaccines and biofuels; and improve crop production. An estimated R564.7 million over the medium term is allocated in the *Technology Innovation* programme for developing hydrogen fuel cell technology, renewable energy technology and energy storage applications.

To ensure that publicly funded intellectual property is protected and used to create products, processes and services that improve the quality of life in South Africa, the department plans to spend R170.4 million over the medium term in the *National Intellectual Property Management Office* subprogramme in the *Technology Innovation* programme. Activities in the subprogramme provide support to institutions to protect and maintain their intellectual property through the Intellectual Property Fund.

The national space strategy aims to promote the peaceful use of space; support the creation of an environment conducive to industrial development in space technology; foster research in space science, communications, navigation and space physics; and advance scientific, engineering and technological competencies in space-related activities. As such, in implementing the national space strategy towards ensuring that South Africa captures a reasonable share of the global space market, which involves economic activities related to manufacturing components that enter the earth's orbit or go beyond, R597.9 million over the MTEF period is allocated in the *Space Science* subprogramme in the *Technology Innovation* programme.

Developing human capital

Highly skilled human capital is essential to developing a national system of innovation that is globally competitive and responsive to South Africa's developmental needs. Accordingly, the department has allocated R8.2 billion over the medium term in the *Human Capital and Science Promotions* subprogramme in the *Research, Development and Support* programme for postgraduate bursaries and scholarships, internships, and support for emerging and established researchers; and towards strategic instruments such as the South African research chairs initiative and centres of excellence programmes.

Over the medium term, the department aims to award 9 300 bursaries to PhD students, 32 400 bursaries to postgraduate students and place 1 750 graduates in department-funded work preparation programmes in science, engineering and technology institutions. To date, the department has established 216 research chairs and 15 centres of excellence across South Africa. Research chairs are designed to attract and retain excellence in research and innovation at South African public universities by expanding scientific research and innovation capacity; and centres of excellence bring together a range of universities and science councils in partnerships to tackle challenges in areas such as health, food security, human development, energy and biodiversity.

Funding research, innovation and infrastructure

The availability of adequate infrastructure is vital for the national system of innovation to be globally competitive. This infrastructure includes research equipment, pilot plants (small production plants that test processes before they are commercialised), technology demonstrators (proof concepts to showcase possible applications, feasibility, performance and methods of ideas for new technologies), and facilities for specialised sectors such as aerospace. To provide infrastructure for research and development across the national system of innovation, the department has earmarked R2.2 billion over the MTEF period in the *Research, Development and Support* programme.

An estimated R798 million will enable the implementation of the national integrated cyber-infrastructure system by the Council for Scientific and Industrial Research. The system supports the successful and sustainable implementation of national projects such as MeerKAT and the Square Kilometre Array, as well as large research infrastructure dependent on the presence of a robust cyber-infrastructure system. Funding for the system constitutes 40 per cent of the total allocation to the Council for Scientific and Industrial Research over the medium term. In addition, funds allocated to the *Basic Science and Infrastructure* subprogramme in the *Research Development and Support* programme will continue to enable students and researchers to access international

infrastructure such as the Large Hadron Collider in Switzerland, the Joint Institute for Nuclear Research in Russia, and the European Synchrotron Radiation Facility in France.

To support scientific research in strategic research areas defined by South Africa's geographic advantage, such as palaeosciences, astronomy, climate change, marine and polar research, and indigenous knowledge, R748.8 million over the MTEF period is allocated in the *Science Missions* subprogramme in the *Research, Development and Support* programme. Of this amount, R258.4 million over the medium term is earmarked to promote science through engagements such as exhibitions and festivals. This is expected to be done through the South African Agency for Science and Technology Advancement with the aim of advancing the South African public's awareness of, appreciation for and engagement with science, engineering and technology.

Generating and exploiting knowledge and innovation for inclusive economic development

The work carried out in the *Socioeconomic Innovation Partnerships* programme is targeted at generating and exploiting knowledge and innovation that aligns with government's priorities for inclusive economic development. Over the medium term, R123.6 million is expected to be invested in a range of ICT initiatives such as artificial intelligence, nanotechnology, quantum computing and biotechnology, many of which are essential for South Africa to exploit the opportunities associated with the fourth industrial revolution.

Over the medium term, an estimated R3.3 billion in the *Sector Innovation and Green Economy* subprogramme in the *Socioeconomic Innovation Partnerships* programme will be used to advance a set of technology-based interventions. These interventions include the sector innovation funds, a partnership between industry and government formed to enhance South Africa's economic competitiveness with the aim of improving economic competitiveness and addressing local needs, with an emphasis on increased market share for exports. The overarching objective of the initiative is to create an environment where government can effectively partner with industry to co-fund research, development and innovation. In addition, to fund activities related to advancing the development of a joint industry-government mining research and development hub, R150 million in 2019/20 is allocated in the *Socioeconomic Innovation Partnerships* programme.

Expenditure trends

Table 30.2 Vote expenditure trends by programme and economic classification

Programmes																																										
1. Administration																																										
2. Technology Innovation																																										
3. International Cooperation and Resources																																										
4. Research, Development and Support																																										
5. Socioeconomic Innovation Partnerships																																										
Programme	Annual budget			Adjusted appropriation			Audited outcome			Annual budget			Adjusted appropriation			Audited outcome			Annual budget			Adjusted appropriation			Audited outcome			Annual budget			Adjusted appropriation			Revised estimate			Average: Outcome/Annual budget (%)			Average: Outcome/Adjusted appropriation (%)		
R million	2015/16			2016/17			2017/18			2018/19			2015/16 - 2018/19			2015/16 - 2018/19			2015/16 - 2018/19			2015/16 - 2018/19			2015/16 - 2018/19			2015/16 - 2018/19			2015/16 - 2018/19											
Programme 1	299.8	300.5	279.1	304.0	345.1	311.8	383.7	376.0	321.0	383.8	379.5	379.5	383.8	379.5	379.5	94.2%	92.2%	94.2%	92.2%	94.2%	92.2%	94.2%	92.2%	94.2%	92.2%	94.2%	92.2%	94.2%	92.2%	94.2%	92.2%	94.2%	92.2%									
Programme 2	1 008.8	1 008.5	1 067.4	1 007.1	1 005.4	1 019.8	1 073.6	1 075.1	1 118.0	1 131.7	1 131.7	1 131.7	1 131.7	1 131.7	1 131.7	102.7%	102.8%	102.7%	102.8%	102.7%	102.8%	102.7%	102.8%	102.7%	102.8%	102.7%	102.8%	102.7%	102.8%	102.7%	102.8%	102.7%	102.8%									
Programme 3	122.0	121.4	124.4	124.5	124.5	125.8	128.7	132.4	135.2	136.4	137.9	137.9	136.4	137.9	137.9	102.3%	101.4%	102.3%	101.4%	102.3%	101.4%	102.3%	101.4%	102.3%	101.4%	102.3%	101.4%	102.3%	101.4%	102.3%	101.4%	102.3%	101.4%									
Programme 4	4 247.1	4 238.8	4 223.5	4 200.6	4 171.0	4 157.5	4 348.9	4 350.1	4 299.3	4 360.3	4 531.0	4 531.0	4 360.3	4 531.0	4 531.0	100.3%	99.5%	100.3%	99.5%	100.3%	99.5%	100.3%	99.5%	100.3%	99.5%	100.3%	99.5%	100.3%	99.5%	100.3%	99.5%	100.3%	99.5%									
Programme 5	1 804.5	1 796.9	1 743.1	1 792.9	1 783.0	1 768.6	1 622.3	1 623.6	1 616.1	1 778.3	1 778.3	1 778.3	1 778.3	1 778.3	1 778.3	98.7%	98.9%	98.7%	98.9%	98.7%	98.9%	98.7%	98.9%	98.7%	98.9%	98.7%	98.9%	98.7%	98.9%	98.7%	98.9%	98.7%	98.9%									
Total	7 482.1	7 466.1	7 437.5	7 429.0	7 429.0	7 383.6	7 557.2	7 557.2	7 489.5	7 790.5	7 958.4	7 958.4	7 790.5	7 958.4	7 958.4	100.0%	99.5%	100.0%	99.5%	100.0%	99.5%	100.0%	99.5%	100.0%	99.5%	100.0%	99.5%	100.0%	99.5%	100.0%	99.5%	100.0%	99.5%									
Change to 2018 Budget estimate											167.9			167.9																												
Economic classification																																										
Current payments	496.4	495.0	464.8	509.7	532.3	507.9	575.8	570.7	514.2	603.3	602.7	602.7	603.3	602.7	602.7	95.6%	94.9%	95.6%	94.9%	95.6%	94.9%	95.6%	94.9%	95.6%	94.9%	95.6%	94.9%	95.6%	94.9%	95.6%	94.9%	95.6%	94.9%									
Compensation of employees	291.3	295.3	301.1	309.2	313.8	319.0	315.5	326.8	323.8	339.8	339.8	339.8	339.8	339.8	339.8	102.2%	100.6%	102.2%	100.6%	102.2%	100.6%	102.2%	100.6%	102.2%	100.6%	102.2%	100.6%	102.2%	100.6%	102.2%	100.6%	102.2%	100.6%									
Goods and services	205.1	199.7	163.7	200.5	218.5	188.9	260.2	243.9	190.3	263.5	262.9	262.9	263.5	262.9	262.9	86.7%	87.1%	86.7%	87.1%	86.7%	87.1%	86.7%	87.1%	86.7%	87.1%	86.7%	87.1%	86.7%	87.1%	86.7%	87.1%	86.7%	87.1%									

Table 30.2 Vote expenditure trends by programme and economic classification

Economic classification	2015/16			2016/17			2017/18			2018/19			Average: Outcome/Annual budget (%)		Average: Outcome/Adjusted appropriation (%)	
	Annual budget	Adjusted appropriation	Audited outcome	Annual budget	Adjusted appropriation	Audited outcome	Annual budget	Adjusted appropriation	Audited outcome	Annual budget	Adjusted appropriation	Revised estimate	2015/16	2018/19	2015/16	2018/19
R million																
Transfers and subsidies	6 983.4	6 968.8	6 956.1	6 917.0	6 872.2	6 860.1	6 960.5	6 964.5	6 954.5	7 175.0	7 343.5	7 343.5	100.3%	99.9%		
Departmental agencies and accounts	5 466.0	5 457.1	4 758.4	5 344.7	5 311.4	4 695.1	5 204.3	5 204.3	4 768.2	5 312.3	5 496.5	5 496.5	93.3%	92.7%		
Higher education institutions	114.6	114.6	225.7	-	-	204.3	-	-	-	-	-	-	375.3%	375.3%		
Public corporations and private enterprises	1 253.3	1 249.8	1 833.1	1 307.4	1 299.4	1 793.8	1 447.1	1 447.1	1 722.5	1 519.9	1 504.8	1 504.8	124.0%	124.6%		
Non-profit institutions	149.6	147.3	138.3	264.9	261.4	165.6	309.1	313.1	462.5	342.8	341.6	341.6	103.9%	104.2%		
Households	-	-	0.6	-	-	1.3	-	-	1.2	-	0.7	0.7	-	584.8%		
Payments for capital assets	2.3	2.3	16.5	2.3	24.5	15.5	21.0	22.0	20.6	12.2	12.2	12.2	171.4%	106.2%		
Machinery and equipment	2.3	2.3	16.5	2.3	24.5	15.5	21.0	22.0	20.6	12.2	12.2	12.2	171.4%	106.2%		
Payments for financial assets	-	-	0.1	-	-	0.1	-	-	0.2	-	-	-	-	-		
Total	7 482.1	7 466.1	7 437.5	7 429.0	7 429.0	7 383.6	7 557.2	7 557.2	7 489.5	7 790.5	7 958.4	7 958.4	100.0%	99.5%		

Expenditure estimates

Table 30.3 Vote expenditure estimates by programme and economic classification

Programmes										
1. Administration										
2. Technology Innovation										
3. International Cooperation and Resources										
4. Research, Development and Support										
5. Socioeconomic Innovation Partnerships										
Programme	Revised estimate	Average growth rate (%)		Average: Expenditure/ Total (%)	Medium-term expenditure estimate			Average growth rate (%)		Average: Expenditure/ Total (%)
		2018/19	2015/16		2018/19	2019/20	2020/21	2021/22	2018/19	
R million										
Programme 1	379.5	8.1%	4.3%	380.3	342.9	359.9	-1.8%	4.3%		
Programme 2	1 131.7	3.9%	14.3%	1 224.3	1 293.2	1 355.0	6.2%	14.9%		
Programme 3	137.9	4.4%	1.7%	149.0	158.1	165.0	6.2%	1.8%		
Programme 4	4 531.0	2.2%	56.9%	4 572.9	4 900.9	5 155.4	4.4%	57.0%		
Programme 5	1 778.3	-0.3%	22.8%	1 824.4	1 928.2	1 867.9	1.7%	22.0%		
Total	7 958.4	2.2%	100.0%	8 151.0	8 623.2	8 903.2	3.8%	100.0%		
Change to 2018 Budget estimate				(97.4)	(85.9)	(81.4)				
Economic classification										
Current payments	602.7	6.8%	6.9%	635.3	616.1	649.3	2.5%	7.4%		
Compensation of employees	339.8	4.8%	4.2%	380.5	408.4	435.0	8.6%	4.6%		
Goods and services	262.9	9.6%	2.7%	254.8	207.6	214.3	-6.6%	2.8%		
Transfers and subsidies	7 343.5	1.8%	92.9%	7 513.0	8 004.3	8 251.0	4.0%	92.5%		
Departmental agencies and accounts	5 496.5	0.2%	65.1%	5 583.1	5 968.4	6 126.8	3.7%	68.9%		
Public corporations and private enterprises	1 504.8	6.4%	22.6%	1 563.9	1 649.9	1 718.0	4.5%	19.1%		
Non-profit institutions	341.6	32.4%	3.7%	366.0	386.1	406.3	5.9%	4.5%		
Households	0.7	-	0.0%	-	-	-	-100.0%	0.0%		
Payments for capital assets	12.2	74.1%	0.2%	2.7	2.8	2.9	-38.0%	0.1%		
Machinery and equipment	12.2	74.1%	0.2%	2.7	2.8	2.9	-38.0%	0.1%		
Total	7 958.4	2.2%	100.0%	8 151.0	8 623.2	8 903.2	3.8%	100.0%		

Expenditure trends and estimates for significant spending items

Table 30.4 Expenditure trends and estimates for significant spending items

R thousand	Audited outcome			Adjusted appropriation	Average growth rate (%)	Average Expenditure/ Total (%)	Medium-term expenditure estimate			Average growth rate (%)	Average Expenditure/ Total (%)
	2015/16	2016/17	2017/18				2018/19	2019/20	2020/21		
National Research Foundation	2 951 503	2 942 413	2 973 010	3 072 429	1.3%	39.4%	3 198 790	3 450 360	3 611 471	5.5%	39.6%
Human Sciences Research Council	294 151	290 149	311 609	313 717	2.2%	4.0%	326 259	344 295	360 584	4.8%	4.0%
Council for Scientific and Industrial Research	1 033 683	1 086 589	1 356 964	1 262 503	6.9%	15.7%	1 277 509	1 347 729	1 401 397	3.5%	15.7%
Technology Innovation Agency	385 188	382 364	396 732	420 322	3.0%	5.2%	440 929	465 161	481 018	4.6%	5.4%
Total	4 664 525	4 701 515	5 038 315	5 068 971	2.8%	64.3%	5 243 487	5 607 545	5 854 470	4.9%	64.7%

Goods and services expenditure trends and estimates

Table 30.5 Vote goods and services expenditure trends and estimates

R thousand	Audited outcome			Adjusted appropriation	Average growth rate (%)	Average Expenditure/ Total (%)	Medium-term expenditure estimate			Average growth rate (%)	Average Expenditure/ Total (%)
	2015/16	2016/17	2017/18				2018/19	2019/20	2020/21		
Administrative fees	2 149	1 246	1 529	1 541	-10.5%	0.8%	1 782	1 880	2 045	9.9%	0.8%
Advertising	8 942	12 657	11 853	9 795	3.1%	5.4%	11 213	13 330	13 751	12.0%	5.1%
Minor assets	537	249	623	644	6.2%	0.3%	695	732	755	5.4%	0.3%
Audit costs: External	5 061	4 249	3 702	20 380	59.1%	4.1%	4 488	2 900	2 992	-47.2%	3.3%
Bursaries: Employees	1 067	1 485	2 620	3 540	49.1%	1.1%	2 927	3 088	3 186	-3.5%	1.4%
Catering: Departmental activities	3 501	3 496	2 072	3 181	-3.1%	1.5%	3 405	3 588	3 701	5.2%	1.5%
Communication	7 624	8 427	13 152	13 509	21.0%	5.3%	10 675	10 299	10 619	-7.7%	4.8%
Computer services	6 418	6 056	8 571	9 067	12.2%	3.7%	6 082	5 777	5 963	-13.0%	2.9%
Consultants: Business and advisory services	12 762	20 870	7 385	26 491	27.6%	8.4%	21 429	22 192	22 894	-4.7%	9.9%
Legal services	–	167	997	1 054	–	0.3%	1 113	1 174	1 211	4.7%	0.5%
Science and technological services	580	866	–	–	-100.0%	0.2%	–	–	–	–	–
Contractors	3 547	3 523	9 508	10 544	43.8%	3.4%	4 860	4 386	4 516	-24.6%	2.6%
Agency and support/outsourced services	8 616	13 718	11 437	17 639	27.0%	6.4%	16 132	16 061	16 647	-1.9%	7.1%
Entertainment	1 051	677	1 824	5 594	74.6%	1.1%	5 179	5 463	5 637	0.3%	2.3%
Fleet services (including government motor transport)	764	882	2	–	-100.0%	0.2%	–	–	–	–	–
Inventory: Clothing material and accessories	48	–	–	–	-100.0%	–	–	–	–	–	–
Inventory: Fuel, oil and gas	72	–	136	144	26.0%	–	152	160	165	4.6%	0.1%
Inventory: Materials and supplies	103	–	–	–	-100.0%	–	–	–	–	–	–
Inventory: Medical supplies	1	–	–	–	-100.0%	–	–	–	–	–	–
Inventory: Other supplies	1	–	1 270	1 343	1003.3%	0.3%	1 417	1 494	1 543	4.7%	0.6%
Consumable supplies	995	1 160	–	–	-100.0%	0.3%	3	3	3	–	–
Consumables: Stationery, printing and office supplies	2 659	4 967	3 795	9 070	50.5%	2.5%	5 863	6 185	6 380	-11.1%	2.9%
Operating leases	2 906	4 117	9 452	7 762	38.7%	3.0%	4 397	4 639	4 785	-14.9%	2.3%
Rental and hiring	542	1 280	–	–	-100.0%	0.2%	–	–	–	–	–
Property payments	–	10 455	16 837	23 886	–	6.4%	71 479	14 220	14 673	-15.0%	13.2%
Transport provided: Departmental activity	18 005	–	–	–	-100.0%	2.2%	–	–	–	–	–
Travel and subsistence	49 394	67 191	50 241	58 826	6.0%	28.0%	53 917	58 167	59 954	0.6%	24.6%
Training and development	8 890	4 944	7 968	8 101	-3.1%	3.7%	6 221	6 563	6 770	-5.8%	2.9%
Operating payments	10 607	10 521	10 693	8 136	-8.5%	5.0%	8 651	9 123	9 405	5.0%	3.8%
Venues and facilities	6 897	5 673	14 680	22 639	48.6%	6.2%	12 725	16 207	16 696	-9.7%	7.3%
Total	163 739	188 876	190 347	262 886	17.1%	100.0%	254 805	207 631	214 291	-6.6%	100.0%

Transfers and subsidies expenditure trends and estimates

Table 30.6 Vote transfers and subsidies trends and estimates

R thousand	Audited outcome			Adjusted appropriation 2018/19	Average growth rate (%)		Medium-term expenditure estimate			Average growth rate (%) 2018/19 - 2021/22	Average: Expenditure/ Total (%) 2018/19 - 2021/22
	2015/16	2016/17	2017/18		2015/16	2018/19	2019/20	2020/21	2021/22		
Households											
Social benefits											
Current	378	1 048	565	650	19.8%	–	–	–	–	-100.0%	–
Households	378	1 048	565	650	19.8%	–	–	–	–	-100.0%	–
Departmental agencies and accounts											
Departmental agencies (non-business entities)											
Current	3 666 930	3 662 604	3 719 686	3 978 697	2.8%	53.5%	4 215 155	4 437 720	4 517 088	4.3%	55.1%
Various institutions: Biofuels	6 000	–	–	–	-100.0%	–	–	–	–	–	–
Various institutions: Technology transfer offices: Support of research units	4 411	687	6 901	–	-100.0%	–	–	–	–	–	–
Various institutions: Implementation of bioeconomy strategy	9 500	9 500	–	–	-100.0%	0.1%	–	–	–	–	–
Various institutions: Energy grand challenge research	26 373	22 316	17 501	37 049	12.0%	0.4%	40 946	43 198	45 411	7.0%	0.5%
Various institutions: Health innovation research	37 568	37 500	–	–	-100.0%	0.3%	–	–	–	–	–
Various institutions: HIV and AIDS prevention and treatment technologies research	24 535	23 800	55 007	24 588	0.1%	0.5%	27 866	29 399	31 684	8.8%	0.4%
Various institutions: Hydrogen strategy research	16 984	4 007	–	–	-100.0%	0.1%	–	–	–	–	–
Various institutions: Innovation projects research	12 000	10 000	25 750	38 529	47.5%	0.3%	35 318	37 260	39 285	0.6%	0.5%
International Centre for Genetic Engineering and Biotechnology	–	–	12 795	13 537	–	0.1%	14 295	15 081	16 914	7.7%	0.2%
Various institutions: Space science research: Economic competitiveness and support package	71 978	–	44 860	9 200	-49.6%	0.4%	30 000	31 650	34 006	54.6%	0.3%
National Research Foundation: Indigenous knowledge systems	1 840	–	–	–	-100.0%	–	–	–	–	–	–
Technology Innovation Agency	385 188	382 364	396 732	420 322	3.0%	5.6%	440 929	465 161	481 018	4.6%	5.8%
South African National Space Agency	124 355	154 630	131 226	138 036	3.5%	2.0%	143 464	151 338	157 427	4.5%	1.9%
Various institutions: Emerging research areas	11 802	11 498	–	–	-100.0%	0.1%	–	–	–	–	–
National Research Foundation: Research and development in indigenous knowledge systems	–	–	4 604	6 071	–	–	5 144	5 427	6 992	4.8%	0.1%
National Research Foundation: Bilateral cooperation for global science development	13 530	13 598	13 979	14 948	3.4%	0.2%	15 952	16 829	17 664	5.7%	0.2%
Various institutions: Global science: International multilateral agreements	22 353	28 088	27 857	–	-100.0%	0.3%	–	–	–	–	–
Various institutions: Global science: African multilateral agreements	958	2 900	3 300	–	-100.0%	–	–	–	–	–	–
Academy of Science of South Africa	–	–	25 261	25 668	–	0.2%	26 983	28 467	36 647	12.6%	0.4%
Various institutions: Astronomy research and development	25 155	14 069	29 348	31 050	7.3%	0.4%	32 789	34 592	42 585	11.1%	0.5%
Various institutions: Policy development on human and social development dynamics	10 283	10 283	26 012	27 409	38.7%	0.3%	28 896	30 485	38 731	12.2%	0.4%
National Research Foundation: Human resources development for science and engineering	878 609	841 728	794 601	889 172	0.4%	12.1%	950 582	1 000 577	1 041 455	5.4%	12.5%
National Research Foundation: Human resources development for science and engineering: Economic competitiveness and support package	–	38 388	39 056	13 800	–	0.3%	22 000	23 210	19 505	12.2%	0.3%
National Research Foundation	878 399	882 805	925 964	904 752	1.0%	12.8%	943 385	985 813	1 033 741	4.5%	12.4%
Various institutions: Science awareness, research and initiatives to encourage youth participation in science	57 766	66 221	73 018	77 253	10.2%	1.0%	81 579	86 066	96 069	7.5%	1.1%
National Research Foundation: Square Kilometre Array: Research and development	2 000	–	–	–	-100.0%	–	–	–	–	–	–
National Research Foundation: South African research chairs initiative	470 446	482 243	500 875	530 274	4.1%	7.1%	566 305	597 452	623 614	5.6%	7.4%

Table 30.6 Vote transfers and subsidies trends and estimates

R thousand	Audited outcome			Adjusted appropriation	Average growth rate (%)		Medium-term expenditure estimate			Average growth rate (%)	
	2015/16	2016/17	2017/18		2018/19	2015/16 - 2018/19	2019/20	2020/21	2021/22	2018/19 - 2021/22	Average: Expenditure/ Total (%)
Various institutions: Strategic science platforms for research and development	149 943	181 819	180 626	208 325	11.6%	2.6%	220 176	232 286	246 530	5.8%	2.9%
Various institutions: Economic competitiveness and support package: Local manufacturing capacity research and technical support	–	–	–	80 000	–	0.3%	80 000	84 400	–	-100.0%	0.8%
Various institutions: Economic competitiveness and support package: Local systems of innovation for the cold chain technologies project	–	–	–	62 000	–	0.2%	62 000	65 410	–	-100.0%	0.6%
Various institutions: Innovative research and development	13 786	6 866	35 049	39 890	42.5%	0.3%	41 955	46 683	50 656	8.3%	0.6%
Human Sciences Research Council	288 706	290 149	304 656	303 733	1.7%	4.2%	313 855	331 209	344 145	4.3%	4.2%
Various institutions: Local manufacturing capacity research and technical support	42 000	70 739	3 311	25 864	-14.9%	0.5%	28 689	30 267	34 162	9.7%	0.4%
Various institutions: Local systems of innovation for the cold chain technologies project	60 000	64 000	30 689	10 632	-43.8%	0.6%	11 793	12 442	15 774	14.1%	0.2%
Various institutions: Resource-based industries research and development	1 304	1 000	–	–	-100.0%	–	–	–	–	–	–
National Research Foundation: Research information management system	12 240	7 201	–	4 000	-31.1%	0.1%	8 448	8 913	11 693	43.0%	0.1%
Human Science Research Council: Develop and monitor science and technology indicators	5 445	–	6 953	9 984	22.4%	0.1%	12 404	13 086	16 439	18.1%	0.2%
Various institutions: Environmental innovation	1 473	4 205	3 755	32 611	180.8%	0.1%	29 402	31 019	34 941	2.3%	0.4%
Capital	1 136 449	1 079 949	1 137 597	1 531 597	10.5%	17.4%	1 389 989	1 553 856	1 629 245	2.1%	19.6%
Various institutions: Infrastructure projects for research and development	449 034	413 312	443 666	822 185	22.3%	7.6%	703 015	741 717	772 438	-2.1%	9.8%
National Research Foundation: Square Kilometre Array: Research	687 415	666 637	693 931	709 412	1.1%	9.8%	686 974	812 139	856 807	6.5%	9.9%
Households											
Other transfers to households											
Current	125	230	280	–	-100.0%	–	–	–	–	–	–
Households	–	–	280	–	–	–	–	–	–	–	–
Various institutions: Policy development on human and social development dynamics	125	200	–	–	-100.0%	–	–	–	–	–	–
Various institutions: Strategic science platforms for research and development	–	30	–	–	–	–	–	–	–	–	–
Public corporations and private enterprises											
Other transfers to private enterprises											
Current	42 227	–	15 812	–	-100.0%	0.2%	–	–	–	–	–
Various institutions: Technology transfer offices: Support for research units	–	–	1 417	–	–	–	–	–	–	–	–
South African Medical Research Council	–	–	1 000	–	–	–	–	–	–	–	–
Various institutions: Innovation projects research	–	–	50	–	–	–	–	–	–	–	–
Various institutions: Advanced manufacturing technology strategy implementation	42 227	–	13 345	–	-100.0%	0.2%	–	–	–	–	–
Non-profit institutions											
Current	132 679	148 234	261 219	270 669	26.8%	2.9%	291 028	307 034	323 330	6.1%	3.8%
Various institutions: Institutional and programme support research	14 760	17 021	16 642	14 286	-1.1%	0.2%	15 086	15 916	16 233	4.4%	0.2%
Various institutions: Biofuels research	–	1 799	5 348	7 245	–	0.1%	7 651	8 072	9 683	10.2%	0.1%
Various institutions: Implementation of the biotechnology strategy	8 089	11 556	36 112	37 742	67.1%	0.3%	41 651	43 942	46 179	7.0%	0.5%
Various institutions: Energy grand challenge research	–	700	–	–	–	–	–	–	–	–	–
Various institutions: Health innovation research	–	300	6 029	75 747	–	0.3%	51 160	53 974	57 036	-9.0%	0.8%
Various institutions: Hydrogen strategy (research)	–	–	46 274	40 206	–	0.3%	42 458	44 793	45 312	4.1%	0.6%
Various institutions: Innovation projects research	2 955	1 000	–	–	-100.0%	–	–	–	–	–	–
International Centre for Genetic Engineering and Biotechnology	11 621	22 186	–	–	-100.0%	0.1%	–	–	–	–	–
Various institutions: Space science research	–	–	3 595	–	–	–	–	–	–	–	–

Table 30.6 Vote transfers and subsidies trends and estimates

R thousand	Audited outcome			Adjusted appropriation 2018/19	Average growth rate (%) 2015/16 - 2018/19	Average: Expenditure/ Total (%)	Medium-term expenditure estimate			Average growth rate (%) 2018/19 - 2021/22	Average: Expenditure/ Total (%)
	2015/16	2016/17	2017/18				2019/20	2020/21	2021/22		
Various institutions: Technology transfer offices: Support for research units	–	1 833	55 125	39 000	–	0.3%	41 184	43 449	45 720	5.4%	0.5%
National Research Foundation: Indigenous knowledge systems	500	–	–	–	-100.0%	–	–	–	–	–	–
Southern African Association of Science and Technology Centres: Technology top 100 awards	3 507	–	24 583	3 916	3.7%	0.1%	4 135	4 362	5 856	14.4%	0.1%
South African National AIDS Council	–	–	15 000	–	–	0.1%	31 680	33 422	35 834	–	0.3%
Various institutions: Emerging research areas	6 000	6 000	–	–	-100.0%	–	–	–	–	–	–
Various institutions: Global science: International multilateral agreements	147	424	13 629	43 139	564.5%	0.2%	46 009	48 539	50 326	5.3%	0.6%
Various institutions: Global science: African multilateral agreements	723	2 950	649	9 388	135.0%	–	10 014	10 565	11 151	5.9%	0.1%
Academy of Science of South Africa	23 229	25 106	12 480	–	-100.0%	0.2%	–	–	–	–	–
Various institutions: Science awareness	3 310	3 060	–	–	-100.0%	–	–	–	–	–	–
Various institutions: Strategic science platforms for research and development	1 500	3 311	–	–	-100.0%	–	–	–	–	–	–
Various institutions: Advanced manufacturing technology strategy implementation	100	100	8 080	–	-100.0%	–	–	–	–	–	–
Various institutions: Innovative research and development	8 105	8 920	–	–	-100.0%	0.1%	–	–	–	–	–
Various institutions: Local systems of innovation for the cold chain technologies project	36 351	30 291	–	–	-100.0%	0.2%	–	–	–	–	–
Various institutions: Resource-based industries research and development	1 706	1 697	–	–	-100.0%	–	–	–	–	–	–
Various institutions: Environmental innovation	10 076	9 980	17 673	–	-100.0%	0.1%	–	–	–	–	–
Capital	–	11 301	151 714	70 971	–	0.8%	74 945	79 067	82 922	5.3%	1.0%
Various institutions: Hydrogen strategy	–	–	67 080	70 971	–	0.5%	74 945	79 067	82 922	5.3%	1.0%
Various institutions: Infrastructure projects for research and development	–	11 301	84 634	–	–	0.3%	–	–	–	–	–
Higher education institutions											
Current	126 185	174 225	–	–	-100.0%	1.1%	–	–	–	–	–
Various institutions: Biofuels	490	2 000	–	–	-100.0%	–	–	–	–	–	–
Various institutions: Technology transfer offices: Support for research units	31 744	23 313	–	–	-100.0%	0.2%	–	–	–	–	–
Various institutions: Implementation of bioeconomy strategy	8 515	995	–	–	-100.0%	–	–	–	–	–	–
Various institutions: Energy grand challenge research	7 360	5 250	–	–	-100.0%	–	–	–	–	–	–
Various institutions: Health innovation research	150	463	–	–	-100.0%	–	–	–	–	–	–
Various institutions: Hydrogen strategy research	16 448	81 438	–	–	-100.0%	0.3%	–	–	–	–	–
Various institutions: Innovation projects research	–	2 004	–	–	–	–	–	–	–	–	–
International Centre for Genetic Engineering and Biotechnology	504	10 000	–	–	-100.0%	–	–	–	–	–	–
National Research Foundation: Indigenous knowledge systems	4 789	3 663	–	–	-100.0%	–	–	–	–	–	–
Various institutions: Emerging research areas	13 500	14 500	–	–	-100.0%	0.1%	–	–	–	–	–
Various institutions: Global science: International multilateral agreements	11 187	8 332	–	–	-100.0%	0.1%	–	–	–	–	–
Various institutions: Global science: African multilateral agreements	1 937	200	–	–	-100.0%	–	–	–	–	–	–
Various institutions: Science awareness	8 118	200	–	–	-100.0%	–	–	–	–	–	–
Various institutions: Strategic science platforms for research and development	6 796	7 244	–	–	-100.0%	–	–	–	–	–	–
Various institutions: Advanced manufacturing technology strategy implementation	2 892	330	–	–	-100.0%	–	–	–	–	–	–
Various institutions: Innovative research and development	4 498	8 000	–	–	-100.0%	–	–	–	–	–	–
Various institutions: Local manufacturing capacity research and technical support	2 407	1 974	–	–	-100.0%	–	–	–	–	–	–
Various institutions: Local systems of innovation for the cold chain technologies project	3 545	4 319	–	–	-100.0%	–	–	–	–	–	–
Various institutions: Resource-based industries research and development	1 305	–	–	–	-100.0%	–	–	–	–	–	–

Table 30.6 Vote transfers and subsidies trends and estimates

R thousand	Audited outcome			Adjusted appropriation	Average growth rate (%)		Average: Expenditure/ Total (%)	Medium-term expenditure estimate			Average growth rate (%)	Average: Expenditure/ Total (%)
	2015/16	2016/17	2017/18		2018/19	2015/16 - 2018/19		2019/20	2020/21	2021/22		
Capital	95 743	27 080	–	–	–100.0%	0.4%	–	–	–	–	–	–
Various institutions: Hydrogen strategy	63 568	–	–	–	–100.0%	0.2%	–	–	–	–	–	–
Various institutions: Infrastructure projects for research and development	32 175	27 080	–	–	–100.0%	0.2%	–	–	–	–	–	–
Public corporations and private enterprises												
Other transfers to public corporations												
Current	448 954	458 983	338 733	291 452	-13.4%	5.5%	324 399	342 241	365 287	7.8%	4.3%	
Various institutions: Technology transfer offices: Support for research units	6 592	5 680	–	–	–100.0%	–	–	–	–	–	–	–
Various institutions: Implementation of bioeconomy strategy	6 850	76 620	11 973	–	–100.0%	0.3%	–	–	–	–	–	–
Various institutions: Energy grand challenge research	–	15 923	2 165	–	–	0.1%	–	–	–	–	–	–
Various institutions: Health innovation research	5 900	2 853	–	–	–100.0%	–	–	–	–	–	–	–
Various institutions: Hydrogen strategy: Research	2 580	–	–	–	–100.0%	–	–	–	–	–	–	–
Various institutions: Innovation projects: Research	14 657	7 450	–	–	–100.0%	0.1%	–	–	–	–	–	–
National Research Foundation: Indigenous knowledge systems	1 735	6 150	–	–	–100.0%	–	–	–	–	–	–	–
Various institutions: Emerging research areas	61 129	–	81 451	97 697	16.9%	0.9%	112 672	118 869	123 981	8.3%	1.5%	
Various institutions: Technology transfer offices: Support of research units	–	–	5 034	–	–	–	–	–	–	–	–	–
Various institutions: Global science: International multilateral agreements	5 338	2 115	1 680	–	–100.0%	–	–	–	–	–	–	–
Various institutions: Global science: African multilateral agreements	3 138	2 200	3 110	–	–100.0%	–	–	–	–	–	–	–
Various institutions: Strategic science platforms for research and development	4 500	4 611	5 215	–	–100.0%	0.1%	–	–	–	–	–	–
Various institutions: Advanced manufacturing technology strategy implementation	–	43 146	51 215	53 678	–	0.5%	59 542	62 817	67 301	7.8%	0.8%	
Council for Scientific and Industrial Research	–	–	3 953	–	–	–	–	–	–	–	–	–
Various institutions: Innovative research and development	12 343	19 295	5 182	–	–100.0%	0.1%	–	–	–	–	–	–
Various institutions: ICT	26 144	21 827	45 790	28 634	3.1%	0.4%	38 533	40 652	44 435	15.8%	0.5%	
Various institutions: Local manufacturing capacity research and technical support	143 101	141 925	–	–	–100.0%	1.0%	–	–	–	–	–	–
Council for Scientific and Industrial Research: Mining research and development	–	–	24 093	63 000	–	0.3%	60 000	63 300	68 239	2.7%	0.8%	
Various institutions: Local systems of innovation for the cold chain technologies project	104 840	54 413	–	–	–100.0%	0.6%	–	–	–	–	–	–
Various institutions: Resource-based industries research and development	45 193	41 100	97 872	48 443	2.3%	0.8%	53 652	56 603	61 331	8.2%	0.7%	
Various institutions: Environmental innovation	4 914	13 675	–	–	–100.0%	0.1%	–	–	–	–	–	–
Capital	486 184	424 380	413 273	236 339	-21.4%	5.5%	251 686	265 529	280 820	5.9%	3.3%	
Council for Scientific and Industrial Research: Cyber-infrastructure research and development	213 479	214 546	413 273	236 339	3.4%	3.8%	251 686	265 529	280 820	5.9%	3.3%	
Various institutions: Infrastructure projects for research and development	272 705	209 834	–	–	–100.0%	1.7%	–	–	–	–	–	–
Public corporations and private enterprises												
Subsidies on products and production												
Current	820 204	872 043	915 645	963 164	5.5%	12.7%	965 823	1 018 900	1 052 338	3.0%	12.9%	
Council for Scientific and Industrial Research	820 204	872 043	915 645	963 164	5.5%	12.7%	965 823	1 018 900	1 052 338	3.0%	12.9%	
Total	6 956 058	6 860 077	6 954 524	7 343 539	1.8%	100.0%	7 513 025	8 004 347	8 251 030	4.0%	100.0%	

Personnel information

Table 30.7 Vote personnel numbers and cost by salary level and programme¹

Number of posts estimated for 31 March 2019		Number and cost ² of personnel posts filled/planned for on funded establishment												Number					
Number of funded posts	Number of posts additional to the establishment	Actual			Revised estimate			Medium-term expenditure estimate						Average growth rate (%)	Average: Salary level/Total (%)				
		2017/18		2018/19		2019/20		2020/21		2021/22		2018/19 - 2021/22							
		Number	Cost	Unit cost	Number	Cost	Unit cost	Number	Cost	Unit cost	Number	Cost	Unit cost	Number	Cost	Unit cost			
Science and Technology																			
Salary level	483	–	433	323.8	0.7	444	352.4	0.8	447	380.5	0.9	448	408.4	0.9	446	435.0	1.0	0.1%	100.0%
1 – 6	75	–	60	11.7	0.2	64	13.1	0.2	65	14.3	0.2	65	15.4	0.2	65	16.6	0.3	0.5%	14.5%
7 – 10	144	–	126	44.4	0.4	130	49.4	0.4	130	53.2	0.4	131	57.6	0.4	130	61.3	0.5	–	29.2%
11 – 12	138	–	135	123.8	0.9	137	134.4	1.0	138	144.8	1.0	138	155.2	1.1	138	166.0	1.2	0.2%	30.9%
13 – 16	126	–	110	139.5	1.3	111	150.7	1.4	112	163.1	1.5	112	174.8	1.6	111	185.3	1.7	–	25.0%
Other	–	–	2	4.5	2.2	2	4.8	2.4	2	5.1	2.6	2	5.5	2.7	2	5.9	2.9	–	0.4%
Programme	483	–	433	323.8	0.7	444	352.4	0.8	447	380.5	0.9	448	408.4	0.9	446	435.0	1.0	0.1%	100.0%
Programme 1	265	–	217	148.1	0.7	222	160.7	0.7	224	174.0	0.8	224	186.8	0.8	223	199.1	0.9	0.1%	50.0%
Programme 2	65	–	55	46.6	0.8	60	53.0	0.9	60	56.7	0.9	60	60.9	1.0	60	65.2	1.1	–	13.4%
Programme 3	64	–	64	50.4	0.8	65	54.4	0.8	65	58.5	0.9	66	62.7	1.0	65	65.8	1.0	–	14.6%
Programme 4	44	–	42	36.4	0.9	42	39.1	0.9	43	42.6	1.0	43	45.8	1.1	43	49.0	1.1	0.8%	9.6%
Programme 5	45	–	55	42.4	0.8	55	45.2	0.8	55	48.6	0.9	55	52.2	0.9	55	55.9	1.0	–	12.3%

1. Data has been provided by the department and may not necessarily reconcile with official government personnel data.

2. Rand million.

Departmental receipts

Table 30.8 Departmental receipts by economic classification

	Audited outcome			Adjusted estimate	Revised estimate	Average growth rate (%)	Average: Receipt item/ Total (%)	Medium-term receipts estimate			Average growth rate (%)	Average: Receipt item/ Total (%)
	2015/16	2016/17	2017/18					2018/19	2019/20	2020/21		
R thousand												
Departmental receipts	514	8 199	10 298	9 644	35 061	308.6%	100.0%	545	545	560	-74.8%	100.0%
Sales of goods and services produced by department	51	57	60	55	35	-11.8%	0.4%	35	35	40	4.6%	0.4%
Other sales	51	57	60	55	35	-11.8%	0.4%	35	35	40	4.6%	0.4%
of which:												
Services rendered: Commission on insurance	51	57	60	55	35	-11.8%	0.4%	35	35	40	4.6%	0.4%
Interest, dividends and rent on land	6	9	34	20	26	63.0%	0.1%	10	10	20	-8.4%	0.2%
Interest	6	9	34	20	26	63.0%	0.1%	10	10	20	-8.4%	0.2%
Sales of capital assets	–	45	430	217	–	–	0.9%	–	–	–	–	–
Transactions in financial assets and liabilities	457	8 088	9 774	9 352	35 000	324.7%	98.6%	500	500	500	-75.7%	99.4%
Total	514	8 199	10 298	9 644	35 061	308.6%	100.0%	545	545	560	-74.8%	100.0%

Programme 1: Administration

Programme purpose

Provide strategic leadership, management and support services to the department.

Expenditure trends and estimates

Table 30.9 Administration expenditure trends and estimates by subprogramme and economic classification

Subprogramme	Audited outcome			Adjusted appropriation 2018/19	Average growth rate (%)		Medium-term expenditure estimate			Average growth rate (%) 2018/19 - 2021/22	Average Expenditure/ Total (%)
	2015/16	2016/17	2017/18		2015/16	2018/19	2019/20	2020/21	2021/22		
R million											
Ministry	4.3	4.2	4.4	5.1	5.9%	1.4%	5.5	5.9	6.1	5.7%	1.5%
Institutional Planning and Support	140.7	151.1	141.7	118.1	-5.7%	42.7%	166.4	168.4	179.8	15.0%	43.3%
Corporate Services	134.1	152.1	167.4	251.2	23.3%	54.6%	145.1	163.0	168.2	-12.5%	49.7%
Office Accommodation	-	4.4	7.5	5.0	-	1.3%	63.3	5.6	5.8	4.8%	5.5%
Total	279.1	311.8	321.0	379.5	10.8%	100.0%	380.3	342.9	359.9	-1.8%	100.0%
Change to 2018 Budget estimate				(4.3)			56.5	(0.2)	(0.1)		
Economic classification											
Current payments	247.7	278.8	283.2	353.0	12.5%	90.0%	362.5	324.1	340.8	-1.2%	94.4%
Compensation of employees	135.8	145.0	148.1	160.9	5.8%	45.7%	174.0	186.8	199.1	7.4%	49.3%
Goods and services ¹	111.9	133.8	135.2	192.1	19.8%	44.4%	188.5	137.3	141.6	-9.7%	45.1%
of which:											
Advertising	8.9	12.0	10.7	8.6	-1.2%	3.1%	10.1	12.1	12.5	13.2%	3.0%
Consultants: Business and advisory services	12.1	15.0	3.7	16.6	11.1%	3.7%	15.4	15.7	16.2	-0.8%	4.4%
Agency and support/outsourced services	2.9	6.9	5.7	9.1	45.9%	1.9%	7.6	7.2	7.4	-6.8%	2.1%
Property payments	-	10.5	16.0	23.0	-	3.8%	70.6	13.3	13.7	-15.9%	8.2%
Travel and subsistence	37.5	37.9	26.0	32.6	-4.5%	10.4%	29.3	32.0	33.0	0.4%	8.7%
Operating payments	7.4	8.7	8.8	6.1	-6.3%	2.4%	6.4	6.8	7.0	4.7%	1.8%
Transfers and subsidies¹	14.9	17.5	17.0	14.3	-1.3%	4.9%	15.1	15.9	16.2	4.4%	4.2%
Non-profit institutions	14.8	17.0	16.6	14.3	-1.1%	4.9%	15.1	15.9	16.2	4.4%	4.2%
Households	0.1	0.5	0.3	-	-100.0%	0.1%	-	-	-	-	-
Payments for capital assets	16.5	15.4	20.6	12.2	-9.5%	5.0%	2.7	2.8	2.9	-38.0%	1.4%
Machinery and equipment	16.5	15.4	20.6	12.2	-9.5%	5.0%	2.7	2.8	2.9	-38.0%	1.4%
Payments for financial assets	0.1	0.1	0.1	-	-100.0%	-	-	-	-	-	-
Total	279.1	311.8	321.0	379.5	10.8%	100.0%	380.3	342.9	359.9	-1.8%	100.0%
Proportion of total programme expenditure to vote expenditure	3.8%	4.2%	4.3%	4.8%	-	-	4.7%	4.0%	4.0%	-	-
Details of selected transfers and subsidies											
Non-profit institutions											
Current	14.8	17.0	16.6	14.3	-1.1%	4.9%	15.1	15.9	16.2	4.4%	4.2%
Various institutions: Institutional and programme support research	14.8	17.0	16.6	14.3	-1.1%	4.9%	15.1	15.9	16.2	4.4%	4.2%

1. Estimates of National Expenditure data tables are available and can be downloaded from www.treasury.gov.za. These data tables contain detailed information by goods and services, and transfers and subsidies item by programme.

Programme 2: Technology Innovation

Programme purpose

Enable research and development in space science and technology, energy security and the bioeconomy, and in the emerging and converging areas of nanotechnology, robotics, photonics and indigenous knowledge systems, to promote the realisation of commercial products, processes and services. Promote the protection and utilisation of intellectual property, technology transfer and technology commercialisation through the implementation of enabling policies and interventions along the entire innovation value chain.

Objectives

- Facilitate and resource strategic investments in space science and technology, energy, the bioeconomy, nanotechnology, robotics, photonics, indigenous knowledge systems, intellectual property management, technology transfer and technology commercialisation by 31 March 2022, by:
 - funding and/or maintaining 59 instruments to support the use of knowledge
 - generating 360 knowledge products (including peer reviewed scientific articles published in scientific publications, and filings/applications or the registration/granting of intellectual property rights)
 - developing and approving 9 science, technology and innovation strategic policy directives to enhance understanding and analyses that support the implementation of relevant interventions

- developing and/or maintaining 6 decision support interventions to improve the delivery of government services or functions
- providing recommendations for 100 per cent of genetically modified organism permit applications received to support decision-making by government.
- Oversee, monitor and regulate key policy initiatives in the strategic areas of space science and technology, energy, bio-innovation, nanotechnology, robotics and photonics by 31 March 2022, by overseeing 610 new disclosures reported by publicly funded institutions.
- Coordinate and support high-level skills development by supporting 525 masters and doctoral students, and 710 trainees through department-funded research and development initiatives by 31 March 2022.
- Support, promote and advocate the development and translation of scientific research and development outputs into commercial products, processes and services that will contribute towards economic growth and better quality of life by 31 March 2022, by:
 - supporting 20 knowledge application products, including prototypes, technology demonstrators and pilots
 - supporting 14 commercial outputs, including licences, assignments, options, new companies, products, processes and services.

Subprogrammes

- *Space Science* supports the creation of an environment conducive to the implementation of the national space strategy and South African earth observation strategy, and that addresses the development of innovative applications and human capital to respond to national priorities and support socioeconomic development.
- *Hydrogen and Energy* provides policy leadership in research, development and innovation initiatives in the energy sector. This subprogramme plays a key role in developing a sustainable and globally competitive South African energy knowledge base and industry.
- *Bio-innovation* leads the implementation of the national bioeconomy strategy approved by Cabinet in 2013.
- *Innovation Priorities and Instruments* supports and strengthens the innovation policy package aimed at creating and sustaining an enabling environment for innovation, technology and development, and the commercialisation of publicly funded research and development initiatives.
- *National Intellectual Property Management Office* is the implementing agency established to provide for the effective use of intellectual property emanating from publicly financed research and development.
- *Office of the Deputy Director-General: Technology Innovation* provides management and administrative support to the programme and the deputy director-general.

Expenditure trends and estimates

Table 30.10 Technology Innovation expenditure trends and estimates by subprogramme and economic classification

Subprogramme	Audited outcome			Adjusted appropriation	Average growth rate (%)		Medium-term expenditure estimate			Average growth rate (%)	Average Expenditure/ Total (%)
	2015/16	2016/17	2017/18		2018/19	2015/16 - 2018/19	2019/20	2020/21	2021/22		
R million											
Space Science	209.1	167.8	188.0	161.9	-8.2%	16.8%	189.4	199.6	208.9	8.9%	15.2%
Hydrogen and Energy	147.7	143.6	147.5	167.8	4.4%	14.0%	178.5	188.5	197.6	5.6%	14.6%
Bio-innovation	136.1	220.2	162.5	178.4	9.5%	16.1%	193.3	204.2	218.8	7.0%	15.9%
Innovation Priorities and Instruments	518.1	442.0	535.6	572.7	3.4%	47.7%	605.4	638.8	664.2	5.1%	49.6%
National Intellectual Property Management Office	52.4	42.2	78.8	50.9	-1.0%	5.2%	53.6	56.8	60.1	5.7%	4.4%
Office of the Deputy-Director General: Technololgy Innovation	4.1	3.9	5.6	–	-100.0%	0.3%	4.2	5.3	5.3	–	0.3%
Total	1 067.4	1 019.8	1 118.0	1 131.7	2.0%	100.0%	1 224.3	1 293.2	1 355.0	6.2%	100.0%
Change to 2018 Budget estimate				–			(4.2)	(4.9)	(7.2)		

Table 30.10 Technology Innovation expenditure trends and estimates by subprogramme and economic classification

Economic classification	Audited outcome			Adjusted appropriation	Average growth rate (%)	Average Expenditure/ Total (%)	Medium-term expenditure estimate			Average growth rate (%)	Average Expenditure/ Total (%)
	2015/16	2016/17	2017/18				2018/19	2019/20	2020/21		
R million											
Current payments	55.7	59.6	60.2	71.9	8.9%	5.7%	78.8	84.7	89.7	7.7%	6.5%
Compensation of employees	42.8	45.8	46.6	49.3	7.4%	4.3%	56.7	60.9	65.2	7.1%	4.7%
Goods and services ¹	12.8	13.8	13.6	22.6	13.7%	1.4%	22.1	23.8	24.6	9.3%	1.8%
<i>of which:</i>											
Communication	0.7	1.0	0.9	0.9	9.1%	0.1%	1.1	1.1	1.1	7.6%	0.1%
Consultants: Business and advisory services	0.2	2.1	1.7	1.7	99.3%	0.1%	1.7	1.8	1.9	2.9%	0.1%
Agency and support/outsourced services	1.0	0.2	4.0	6.7	72.6%	0.2%	6.6	6.9	7.2	12.5%	0.5%
Entertainment	0.0	0.0	0.2	3.9	386.2%	0.1%	3.4	3.5	3.7	8.3%	0.3%
Travel and subsistence	1.0	7.4	2.9	5.4	66.1%	0.4%	5.3	5.9	6.1	11.4%	0.4%
Venues and facilities	0.1	2.0	2.1	2.1	149.4%	0.1%	2.3	2.6	2.6	7.9%	0.2%
Transfers and subsidies¹	1 011.7	960.2	1 057.7	1 059.9	1.6%	94.3%	1 145.5	1 208.5	1 265.3	6.1%	93.5%
Departmental agencies and accounts	732.5	656.3	695.4	687.3	-2.1%	63.9%	738.0	778.5	812.7	5.7%	60.3%
Higher education institutions	147.1	143.6	-	-	-100.0%	6.7%	-	-	-	-	-
Public corporations and private enterprises	99.4	114.7	103.1	97.7	-0.6%	9.6%	112.7	118.9	124.0	8.3%	9.1%
Non-profit institutions	32.7	45.4	259.1	274.8	103.4%	14.1%	294.9	311.1	328.5	6.1%	24.2%
Households	-	0.2	0.1	-	-	-	-	-	-	-	-
Payments for financial assets	0.0	-	0.1	-	-100.0%	-	-	-	-	-	-
Total	1 067.4	1 019.8	1 118.0	1 131.7	2.0%	100.0%	1 224.3	1 293.2	1 355.0	6.2%	100.0%
Proportion of total programme expenditure to vote expenditure	14.4%	13.8%	14.9%	14.2%	-	-	15.0%	15.0%	15.2%	-	-
Details of selected transfers and subsidies											
Departmental agencies and accounts											
Departmental agencies (non-business entities)											
Current	732.5	656.3	695.4	687.3	-2.1%	63.9%	738.0	778.5	812.7	5.7%	60.3%
Various institutions: Biofuels	6.0	-	-	-	-100.0%	0.1%	-	-	-	-	-
Various institutions: Technology transfer offices: Support for research units	4.4	0.7	6.9	-	-100.0%	0.3%	-	-	-	-	-
Various institutions: Implementation of bioeconomy strategy	9.5	9.5	-	-	-100.0%	0.4%	-	-	-	-	-
Various institutions: Energy grand challenge research	26.4	22.3	17.5	37.0	12.0%	2.4%	40.9	43.2	45.4	7.0%	3.3%
Various institutions: Health innovation research	37.6	37.5	-	-	-100.0%	1.7%	-	-	-	-	-
Various institutions: HIV and AIDS prevention and treatment technologies research	24.5	23.8	55.0	24.6	0.1%	2.9%	27.9	29.4	31.7	8.8%	2.3%
Various institutions: Hydrogen strategy research	17.0	4.0	-	-	-100.0%	0.5%	-	-	-	-	-
Various institutions: Innovation projects research	12.0	10.0	25.8	38.5	47.5%	2.0%	35.3	37.3	39.3	0.6%	3.0%
International Centre for Genetic Engineering and Biotechnology	-	-	12.8	13.5	-	0.6%	14.3	15.1	16.9	7.7%	1.2%
Various institutions: Space science research: Economic competitiveness and support package	72.0	-	44.9	9.2	-49.6%	2.9%	30.0	31.7	34.0	54.6%	2.1%
National Research Foundation: Indigenous knowledge systems	1.8	-	-	-	-100.0%	-	-	-	-	-	-
Technology Innovation Agency	385.2	382.4	396.7	420.3	3.0%	36.5%	440.9	465.2	481.0	4.6%	36.1%
South African National Space Agency	124.4	154.6	131.2	138.0	3.5%	12.6%	143.5	151.3	157.4	4.5%	11.8%
Various institutions: Emerging research areas	11.8	11.5	-	-	-100.0%	0.5%	-	-	-	-	-
National Research Foundation: Research and development in indigenous knowledge systems	-	-	4.6	6.1	-	0.2%	5.1	5.4	7.0	4.8%	0.5%

Table 30.10 Technology Innovation expenditure trends and estimates by subprogramme and economic classification

Details of selected transfers and subsidies				Adjusted appropriation	Average growth rate (%)	Average: Expenditure/ Total (%)	Medium-term expenditure estimate			Average growth rate (%)	Average: Expenditure/ Total (%)
Audited outcome			2018/19				2015/16 - 2018/19	2019/20	2020/21		
R million	2015/16	2016/17	2017/18	2018/19	2015/16 - 2018/19	2019/20	2020/21	2021/22	2018/19 - 2021/22	2018/19 - 2021/22	
Public corporations and private enterprises											
Public corporations											
Other transfers to public corporations											
Current	99.4	114.7	100.6	97.7	-0.6%	9.5%	112.7	118.9	124.0	8.3%	9.1%
Various institutions: Technology transfer offices: Support for research units	6.6	5.7	-	-	-100.0%	0.3%	-	-	-	-	-
Various institutions: Implementation of bioeconomy strategy	6.9	76.6	12.0	-	-100.0%	2.2%	-	-	-	-	-
Various institutions: Energy grand challenge research	-	15.9	2.2	-	-	0.4%	-	-	-	-	-
Various institutions: Health innovation research	5.9	2.9	-	-	-100.0%	0.2%	-	-	-	-	-
Various institutions: Hydrogen strategy research	2.6	-	-	-	-100.0%	0.1%	-	-	-	-	-
Various institutions: Innovation projects research	14.7	7.5	-	-	-100.0%	0.5%	-	-	-	-	-
National Research Foundation: Indigenous knowledge systems	1.7	6.2	-	-	-100.0%	0.2%	-	-	-	-	-
Various institutions: Emerging research areas	61.1	-	81.5	97.7	16.9%	5.5%	112.7	118.9	124.0	8.3%	9.1%
Various institutions: Technology transfer offices for support of research units	-	-	5.0	-	-	0.1%	-	-	-	-	-
Higher education institutions											
Current	83.5	143.6	-	-	-100.0%	5.2%	-	-	-	-	-
Various institutions: Biofuels	0.5	2.0	-	-	-100.0%	0.1%	-	-	-	-	-
Various institutions: Technology transfer offices support for research units	31.7	23.3	-	-	-100.0%	1.3%	-	-	-	-	-
Various institutions: Implementation of bioeconomy strategy	8.5	1.0	-	-	-100.0%	0.2%	-	-	-	-	-
Various institutions: Energy grand challenge research	7.4	5.3	-	-	-100.0%	0.3%	-	-	-	-	-
Various institutions: Health innovation research	0.2	0.5	-	-	-100.0%	-	-	-	-	-	-
Various institutions: Hydrogen strategy research	16.4	81.4	-	-	-100.0%	2.3%	-	-	-	-	-
Various institutions: Innovation projects research	-	2.0	-	-	-	-	-	-	-	-	-
International Centre for Genetic Engineering and Biotechnology	0.5	10.0	-	-	-100.0%	0.2%	-	-	-	-	-
National Research Foundation: Indigenous knowledge systems	4.8	3.7	-	-	-100.0%	0.2%	-	-	-	-	-
Various institutions: Emerging research areas	13.5	14.5	-	-	-100.0%	0.6%	-	-	-	-	-
Capital	63.6	-	-	-	-100.0%	1.5%	-	-	-	-	-
Various institutions: Hydrogen strategy	63.6	-	-	-	-100.0%	1.5%	-	-	-	-	-
Non-profit institutions											
Current	32.7	45.4	192.1	203.9	84.1%	10.9%	219.9	232.0	245.6	6.4%	18.0%
Various institutions: Biofuels research	-	1.8	5.3	7.2	-	0.3%	7.7	8.1	9.7	10.2%	0.7%
Various institutions: Implementation of the biotechnology strategy	8.1	11.6	36.1	37.7	67.1%	2.2%	41.7	43.9	46.2	7.0%	3.4%
Various institutions: Energy grand challenge research	-	0.7	-	-	-	-	-	-	-	-	-
Various institutions: Health innovation research	-	0.3	6.0	75.7	-	1.9%	51.2	54.0	57.0	-9.0%	4.8%
Various institutions: Hydrogen strategy research	-	-	46.3	40.2	-	2.0%	42.5	44.8	45.3	4.1%	3.5%
Various institutions: Innovation projects research	3.0	1.0	-	-	-100.0%	0.1%	-	-	-	-	-
International Centre for Genetic Engineering and Biotechnology	11.6	22.2	-	-	-100.0%	0.8%	-	-	-	-	-
Various institutions: Space science research	-	-	3.6	-	-	0.1%	-	-	-	-	-
Various institutions: Technology transfer offices: Support for research units	-	1.8	55.1	39.0	-	2.2%	41.2	43.4	45.7	5.4%	3.4%

Table 30.10 Technology Innovation expenditure trends and estimates by subprogramme and economic classification

Details of selected transfers and subsidies	Audited outcome			Adjusted appropriation	Average growth rate (%)	Average: Expenditure/ Total (%)	Medium-term expenditure estimate			Average growth rate (%)	Average: Expenditure/ Total (%)
	2015/16	2016/17	2017/18				2018/19	2019/20	2020/21		
R million											
National Research Foundation: Indigenous knowledge systems	0.5	–	–	–	-100.0%	–	–	–	–	–	–
Southern African Association of Science and Technology Centres: Technology top 100 awards	3.5	–	24.6	3.9	3.7%	0.7%	4.1	4.4	5.9	14.4%	0.4%
South African National AIDS Council	–	–	15.0	–	–	0.3%	31.7	33.4	35.8	–	2.0%
Various institutions: Emerging research areas	6.0	6.0	–	–	-100.0%	0.3%	–	–	–	–	–
Capital	–	–	67.1	71.0	–	3.2%	74.9	79.1	82.9	5.3%	6.2%
Various institutions: Hydrogen strategy	–	–	67.1	71.0	–	3.2%	74.9	79.1	82.9	5.3%	6.2%

1. Estimates of National Expenditure data tables are available and can be downloaded from www.treasury.gov.za. These data tables contain detailed information by goods and services, and transfers and subsidies item by programme.

Programme 3: International Cooperation and Resources

Programme purpose

Strategically develop, promote and manage international partnerships that strengthen the national system of innovation. Enable an exchange of knowledge, capacity and resources between South Africa and its international partners, with a focus on supporting science, technology and innovation capacity building in Africa. Support South African foreign policy through science diplomacy.

Objectives

- Complement South Africa's national investments in science, technology and innovation, including access to resources for departmental initiatives that require external investment, by securing international funding of R1.4 billion over the medium term.
- Enhance South Africa's national science, technology and innovation capabilities to contribute to the attainment of the department's targets for human capital development by accessing international knowledge and resources through securing the participation of 2 080 South African researchers in international postgraduate training programmes by 31 March 2022.
- Build capacity in and support initiatives for the Southern African Development Community (SADC) and African Union (AU) to advance Africa's growth and development agenda by strengthening cooperation in science, technology and innovation through technical and financial support for 66 approved SADC and AU science, technology and innovation initiatives and programmes by 31 March 2022.
- Support South Africa's foreign policy objectives of creating a better South Africa, a better Africa and a better world by maximising South Africa's strategic interests in international science, technology and innovation cooperation through interventions that ensure South Africa occupies 12 new leadership positions in international science, technology and innovation governance structures by 31 March 2022.

Subprogrammes

- *Multilateral Cooperation and Africa* advances and facilitates South Africa's participation in bilateral science, technology and innovation cooperation initiatives with other African partners; in African multilateral programmes, especially those of the SADC and AU; and in broader multilateral science, technology and innovation partnerships, with a strategic focus on South-South cooperation.
- *International Resources* works to increase the flow of international funding into South African science, technology and innovation initiatives, as well as African regional and continental programmes, through concerted efforts to promote foreign investment and the fostering of strategic partnerships with partners such as the European Union, as well as foundations and philanthropic organisations and the multinational private sector.

- *Overseas Bilateral Cooperation* promotes and facilitates South Africa's bilateral science, technology and innovation cooperation with partners in Europe, the Americas, Asia and Australasia, especially for human capital development and collaborative research and innovation; and secures support for joint cooperation with other African partners.
- *Office of the Deputy Director-General: International Cooperation and Resources* provides management and administrative support to the programme and the deputy director-general.

Expenditure trends and estimates

Table 30.11 International Cooperation and Resources expenditure trends and estimates by subprogramme and economic classification

Subprogramme	Audited outcome			Adjusted appropriation 2018/19	Average growth rate (%) 2015/16 - 2018/19	Average: Expenditure/ Total (%) 2015/16 - 2018/19	Medium-term expenditure estimate			Average growth rate (%) 2018/19 - 2021/22	Average: Expenditure/ Total (%) 2018/19 - 2021/22
	2015/16	2016/17	2017/18				2019/20	2020/21	2021/22		
R million											
Multilateral Cooperation and Africa	25.7	30.4	30.8	32.9	8.6%	22.9%	32.7	34.9	36.1	3.1%	22.4%
International Resources	56.6	54.2	61.5	63.0	3.6%	45.0%	66.9	70.9	74.2	5.6%	45.1%
Overseas Bilateral Cooperation	32.7	33.9	37.8	42.0	8.8%	28.0%	43.8	46.6	49.1	5.3%	29.8%
Office of the Deputy Director-General: International Cooperation and Resources	9.4	7.4	5.2	–	-100.0%	4.2%	5.6	5.7	5.7	–	2.8%
Total	124.4	125.8	135.2	137.9	3.5%	100.0%	149.0	158.1	165.0	6.2%	100.0%
Change to 2018 Budget estimate				1.5			–	–	(0.9)		
Economic classification											
Current payments	65.0	64.9	71.0	69.8	4.3%	52.5%	77.0	82.2	85.9	5.2%	52.3%
Compensation of employees	46.6	48.9	50.4	50.4	5.2%	38.3%	58.5	62.7	65.8	6.6%	39.6%
Goods and services ¹	18.4	16.1	20.6	19.4	1.8%	14.2%	18.6	19.5	20.1	1.1%	12.7%
<i>of which:</i>											
Communication	0.8	1.4	1.5	1.5	23.8%	1.0%	1.6	1.7	1.8	6.6%	1.1%
Agency and support/outsourced services	0.7	0.1	0.7	0.7	-1.5%	0.4%	0.7	0.8	0.8	4.8%	0.5%
Entertainment	0.3	0.2	0.8	0.8	38.2%	0.4%	0.9	0.9	1.0	4.9%	0.6%
Travel and subsistence	1.3	10.4	10.1	8.9	92.1%	5.9%	7.5	7.7	8.0	-3.6%	5.3%
Operating payments	1.6	0.4	1.1	1.2	-9.1%	0.8%	1.3	1.4	1.4	6.3%	0.9%
Venues and facilities	2.1	1.3	4.3	4.1	25.0%	2.3%	3.9	4.1	4.2	0.7%	2.7%
Transfers and subsidies¹	59.3	60.9	64.2	68.1	2.6%	47.5%	72.0	75.9	79.1	7.3%	47.7%
Departmental agencies and accounts	36.8	44.6	45.1	14.9	-26.0%	27.0%	16.0	16.8	17.7	5.7%	10.7%
Higher education institutions	13.1	8.5	–	–	-100.0%	4.1%	–	–	–	–	–
Public corporations and private enterprises	8.5	4.3	4.8	–	-100.0%	3.4%	–	–	–	–	–
Non-profit institutions	0.9	3.4	14.3	52.5	282.1%	12.8%	56.0	59.1	61.5	8.2%	36.9%
Households	0.0	0.1	0.0	0.7	243.8%	0.1%	–	–	–	-100.0%	0.1%
Total	124.4	125.8	135.2	137.9	3.5%	100.0%	149.0	158.1	165.0	6.2%	100.0%
Proportion of total programme expenditure to vote expenditure	1.7%	1.7%	1.8%	1.7%	–	–	1.8%	1.8%	1.9%	–	–
Details of selected transfers and subsidies											
Departmental agencies and accounts											
Departmental agencies (non-business entities)											
Current	36.8	44.6	45.1	14.9	-26.0%	27.0%	16.0	16.8	17.7	5.7%	10.7%
National Research Foundation: Bilateral cooperation for global science development	13.5	13.6	14.0	14.9	3.4%	10.7%	16.0	16.8	17.7	5.7%	10.7%
Various institutions: Global science: International multilateral agreements	22.4	28.1	27.9	–	-100.0%	15.0%	–	–	–	–	–
Various institutions: Global science: African multilateral agreements	1.0	2.9	3.3	–	-100.0%	1.4%	–	–	–	–	–

Table 30.11 International Cooperation and Resources expenditure trends and estimates by subprogramme and economic classification

Details of selected transfers and subsidies		Audited outcome			Adjusted appropriation	Average growth rate (%)	Average: Expenditure/ Total (%)	Medium-term expenditure estimate			Average growth rate (%)	Average: Expenditure/ Total (%)
R million	2015/16	2016/17	2017/18	2018/19	2015/16 - 2018/19	2019/20	2020/21	2021/22	2018/19 - 2021/22	2018/19 - 2021/22	2018/19 - 2021/22	
Public corporations and private enterprises												
Public corporations												
Other transfers to public corporations												
Current	8.5	4.3	4.8	–	-100.0%	3.4%	–	–	–	–	–	
Various institutions: Global science: International multilateral agreements	5.3	2.1	1.7	–	-100.0%	1.7%	–	–	–	–	–	
Various institutions: Global science: African multilateral agreements	3.1	2.2	3.1	–	-100.0%	1.6%	–	–	–	–	–	
Higher education institutions												
Current	13.1	8.5	–	–	-100.0%	4.1%	–	–	–	–	–	
Various institutions: Global science: International multilateral agreements	11.2	8.3	–	–	-100.0%	3.7%	–	–	–	–	–	
Various institutions: Global science: African multilateral agreements	1.9	0.2	–	–	-100.0%	0.4%	–	–	–	–	–	
Non-profit institutions												
Current	0.9	3.4	14.3	52.5	282.1%	12.8%	56.0	59.1	61.5	8.2%	36.9%	
Various institutions: Global science: International multilateral agreements	0.1	0.4	13.6	43.1	543.3%	10.2%	46.0	48.5	50.3	8.7%	30.2%	
Various institutions: Global science: African multilateral agreements	0.7	3.0	0.6	9.4	135.0%	2.6%	10.0	10.6	11.2	5.9%	6.7%	

1. Estimates of National Expenditure data tables are available and can be downloaded from www.treasury.gov.za. These data tables contain detailed information by goods and services, and transfers and subsidies item by programme.

Programme 4: Research, Development and Support

Programme purpose

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

Objectives

- Contribute to the development of representative, high-level human capital able to pursue locally relevant, globally competitive research and innovation activities over the medium term by:
 - awarding 9 300 bursaries to doctoral students
 - awarding 32 400 bursaries to postgraduate (BTech, honours and masters) students
 - placing 1 750 graduates and students in work preparation programmes funded by the department in science, engineering and technology institutions.
- Ensure the availability of and access to internationally comparable research and innovation infrastructure in order to generate new knowledge and train new researchers per year over the medium term by:
 - maintaining the number of research infrastructure grants at 20
 - maintaining the total available broadband capacity provided by the South African National Research Network to 3 500 Gbps.
- Support and promote research that develops basic sciences through the production of new knowledge and relevant training opportunities over the medium term by:
 - maintaining the total number of researchers awarded research grants through programmes managed by the National Research Foundation at 13 500 or above
 - maintaining the number of research articles published by researchers funded by the National Research Foundation and cited in the Thomson Reuters Web of Science citation database at 21 000.
- Develop strategic priority science areas in which South Africa enjoys a competitive advantage through promoting research and training activities and outputs by:

- installing 8 large survey projects correlators in 2019/20, and 64 S-band science mode receivers on the MeerKAT telescope by 2020/21.

Subprogrammes

- *Human Capital and Science Promotions* formulates and implements policies and strategies that address the availability of human capital for science, technology and innovation; provide fundamental support for research activities; and contribute to the development of a society that is knowledgeable about science, critically engaged and scientifically literate.
- *Science Missions* promotes the development of research, the production of scientific knowledge, and human capital in science areas in which South Africa enjoys a geographic advantage.
- *Basic Science and Infrastructure* facilitates the strategic implementation of research and innovation equipment and facilities to promote knowledge production in areas of national priority, and sustain innovation led by research and development.
- *Astronomy* supports the development of astronomical sciences around a new multiwavelength astronomy strategy, and provides strategic guidance and support to relevant astronomy institutions in the implementation of strategic astronomy programmes.
- *Office of the Deputy Director-General: Research, Development and Support* provides management and administrative support to the programme and the deputy director-general.

Expenditure trends and estimates

Table 30.12 Research, Development and Support expenditure trends and estimates by subprogramme and economic classification

Subprogramme	Audited outcome			Adjusted appropriation	Average growth rate (%)		Medium-term expenditure estimate			Average growth rate (%)	Average Expenditure/ Total (%)
	2015/16	2016/17	2017/18		2018/19	2015/16 - 2018/19	2019/20	2020/21	2021/22		
R million											
Human Capital and Science Promotions	2 331.8	2 354.6	2 384.9	2 457.1	1.8%	55.4%	2 608.7	2 739.5	2 869.9	5.3%	55.7%
Science Missions	177.0	213.1	201.7	225.8	8.4%	4.8%	235.5	248.9	264.3	5.4%	5.1%
Basic Science and Infrastructure	987.0	895.5	977.5	1 095.5	3.5%	23.0%	993.5	1 048.3	1 103.3	0.2%	22.1%
Astronomy	723.0	689.5	733.2	752.6	1.3%	16.8%	731.9	859.7	913.2	6.7%	17.0%
Office of the Deputy Director-General: Research, Development and Support	4.6	4.9	2.1	–	-100.0%	0.1%	3.4	4.5	4.7	–	0.1%
Total	4 223.5	4 157.5	4 299.3	4 531.0	2.4%	100.0%	4 572.9	4 900.9	5 155.4	4.4%	100.0%
Change to 2018 Budget estimate				170.7			(91.8)	(22.2)	(10.9)		
Economic classification											
Current payments	48.4	53.2	50.9	55.4	6.4%	1.2%	58.6	62.6	66.4	4.5%	1.3%
Compensation of employees	34.7	38.3	36.4	36.2	4.0%	0.9%	42.6	45.8	49.0	7.8%	0.9%
Goods and services ¹	13.6	14.9	14.5	19.1	12.0%	0.4%	15.9	16.8	17.4	-3.1%	0.4%
of which:											
Administrative fees	0.2	0.3	0.6	0.6	32.3%	–	0.7	0.7	0.8	11.6%	–
Communication	0.3	0.7	0.7	0.7	36.3%	–	0.8	0.8	0.8	6.9%	–
Consultants: Business and advisory services	0.4	2.3	1.0	4.2	118.6%	–	1.3	1.3	1.4	-31.4%	–
Agency and support/outsourced services	1.5	0.8	0.9	0.9	-14.1%	–	1.0	1.0	1.1	5.9%	–
Travel and subsistence	6.4	8.4	8.4	8.9	11.7%	0.2%	8.2	8.6	8.9	–	0.2%
Venues and facilities	1.1	1.0	1.4	2.1	22.9%	–	2.3	2.4	2.5	4.9%	–
Transfers and subsidies¹	4 175.1	4 104.3	4 248.3	4 475.6	2.3%	98.8%	4 514.4	4 838.3	5 088.9	4.4%	98.7%
Departmental agencies and accounts	3 609.1	3 597.5	3 732.4	4 239.3	5.5%	88.2%	4 262.7	4 572.8	4 808.1	4.3%	93.3%
Higher education institutions	47.1	34.5	–	–	-100.0%	0.5%	–	–	–	–	–
Public corporations and private enterprises	490.7	429.0	418.5	236.3	-21.6%	9.1%	251.7	265.5	280.8	5.9%	5.4%
Non-profit institutions	28.0	42.8	97.1	–	-100.0%	1.0%	–	–	–	–	–
Households	0.2	0.5	0.4	–	-100.0%	–	–	–	–	–	–

Table 30.12 Research, Development and Support expenditure trends and estimates by subprogramme and economic classification

Economic classification	Audited outcome			Adjusted appropriation	Average growth rate (%)	Average: Expenditure/ Total (%)	Medium-term expenditure estimate			Average growth rate (%)	Average: Expenditure/ Total (%)
	2015/16	2016/17	2017/18				2018/19	2019/20	2020/21		
R million											
Payments for financial assets	0.0	0.0	0.1	–	-100.0%	–	–	–	–	–	–
Total	4 223.5	4 157.5	4 299.3	4 531.0	2.4%	100.0%	4 572.9	4 900.9	5 155.4	4.4%	100.0%
Proportion of total programme expenditure to vote expenditure	56.8%	56.3%	57.4%	56.9%	–	–	56.1%	56.8%	57.9%	–	–
Details of selected transfers and subsidies											
Departmental agencies and accounts											
Departmental agencies (non-business entities)											
Current	2 472.6	2 517.6	2 594.8	2 707.7	3.0%	59.8%	2 872.7	3 018.9	3 178.9	5.5%	61.5%
Academy of Science of South Africa	–	–	25.3	25.7	–	0.3%	27.0	28.5	36.6	12.6%	0.6%
Various institutions: Astronomy research and development	25.2	14.1	29.3	31.1	7.3%	0.6%	32.8	34.6	42.6	11.1%	0.7%
Various institutions: Policy development on human and social development dynamics	10.3	10.3	26.0	27.4	38.7%	0.4%	28.9	30.5	38.7	12.2%	0.7%
National Research Foundation: Human resources development for science and engineering	878.6	841.7	794.6	889.2	0.4%	19.8%	950.6	1 000.6	1 041.5	5.4%	20.3%
National Research Foundation: Human resources development for science and engineering: Economic competitiveness and support package	–	38.4	39.1	13.8	–	0.5%	22.0	23.2	19.5	12.2%	0.4%
National Research Foundation	878.4	882.8	926.0	904.8	1.0%	20.9%	943.4	985.8	1 033.7	4.5%	20.2%
Various institutions: Science awareness, research and initiatives to encourage youth participation in science	57.8	66.2	73.0	77.3	10.2%	1.6%	81.6	86.1	96.1	7.5%	1.8%
National Research Foundation: Square Kilometre Array: Research and development	2.0	–	–	–	-100.0%	–	–	–	–	–	–
National Research Foundation: South African Research Chairs Initiative to develop human resources in science	470.4	482.2	500.9	530.3	4.1%	11.5%	566.3	597.5	623.6	5.6%	12.1%
Various institutions: Strategic science platforms for research and development	149.9	181.8	180.6	208.3	11.1%	4.2%	220.2	232.3	246.5	6.3%	4.7%
Capital	1 136.4	1 079.9	1 137.6	1 531.6	10.5%	28.4%	1 390.0	1 553.9	1 629.2	2.1%	31.9%
Various institutions: Infrastructure projects for research and development	449.0	413.3	443.7	822.2	22.3%	12.4%	703.0	741.7	772.4	-2.1%	15.9%
National Research Foundation: Square Kilometre Array: Research	687.4	666.6	693.9	709.4	1.1%	16.0%	687.0	812.1	856.8	6.5%	16.0%
Public corporations and private enterprises											
Public corporations											
Other transfers to public corporations											
Current	4.5	4.6	5.2	–	-100.0%	0.1%	–	–	–	–	–
Various institutions: Strategic science platforms for research and development	4.5	4.6	5.2	–	-100.0%	0.1%	–	–	–	–	–
Capital	486.2	424.4	413.3	236.3	-21.4%	9.1%	251.7	265.5	280.8	5.9%	5.4%
Council for Scientific and Industrial Research: Cyber-infrastructure research and development	213.5	214.5	413.3	236.3	3.4%	6.3%	251.7	265.5	280.8	5.9%	5.4%
Various institutions: Infrastructure projects for research and development	272.7	209.8	–	–	-100.0%	2.8%	–	–	–	–	–
Higher education institutions											
Current	14.9	7.4	–	–	-100.0%	0.1%	–	–	–	–	–
Various institutions: Science awareness	8.1	0.2	–	–	-100.0%	–	–	–	–	–	–
Various institutions: Strategic science platforms for research and development	6.8	7.2	–	–	-100.0%	0.1%	–	–	–	–	–
Capital	32.2	27.1	–	–	-100.0%	0.3%	–	–	–	–	–
Various institutions: Infrastructure projects for research and development	32.2	27.1	–	–	-100.0%	0.3%	–	–	–	–	–

Table 30.12 Research, Development and Support expenditure trends and estimates by subprogramme and economic classification

Details of selected transfers and subsidies											
R million	Audited outcome			Adjusted appropriation 2018/19	Average growth rate (%) 2015/16 - 2018/19	Average: Expenditure/ Total (%) 2015/16 - 2018/19	Medium-term expenditure estimate			Average growth rate (%) 2018/19 - 2021/22	Average: Expenditure/ Total (%) 2018/19 - 2021/22
	2015/16	2016/17	2017/18				2019/20	2020/21	2021/22		
Non-profit institutions											
Current	28.0	31.5	12.5	–	-100.0%	0.4%	–	–	–	–	–
Academy of Science of South Africa	23.2	25.1	12.5	–	-100.0%	0.4%	–	–	–	–	–
Various institutions: Science awareness	3.3	3.1	–	–	-100.0%	–	–	–	–	–	–
Various institutions: Strategic science platforms for research and development	1.5	3.3	–	–	-100.0%	–	–	–	–	–	–
Capital	–	11.3	84.6	–	–	0.6%	–	–	–	–	–
Various institutions: Infrastructure projects for research and development	–	11.3	84.6	–	–	0.6%	–	–	–	–	–

1. Estimates of National Expenditure data tables are available and can be downloaded from www.treasury.gov.za. These data tables contain detailed information by goods and services, and transfers and subsidies item by programme.

Programme 5: Socioeconomic Innovation Partnerships

Programme purpose

Enhance the growth and development priority areas of government through targeted science and technology-based innovation interventions, and the development of strategic partnerships with other government departments, industry, research institutions and communities.

Objectives

- Inform and influence how science and technology can be used to achieve inclusive development through knowledge, evidence and learning over the medium term by:
 - publishing 26 knowledge products on innovation for inclusive development
 - maintaining and improving 10 decision support systems
 - generating 45 learning interventions.
- Identify, grow and sustain niche, high-potential science, technology and innovation capabilities for sustainable development and the greening of society and the economy by fully funding and co-funding 375 honours, masters and doctoral students, and adding 22 knowledge and innovation products to the intellectual property portfolio over the medium term.
- Identify, grow and sustain niche, high-potential science, technology and innovation capabilities that improve the competitiveness of existing industries with growth potential in aerospace, advanced manufacturing, chemicals, advanced metals, mining, ICT and sector innovation funds; and facilitate the development of new targeted industries over the medium term by:
 - fully funding or co-funding 1 454 masters and doctoral students, and 590 interns
 - adding 137 new knowledge and innovation products to the intellectual property portfolio
 - funding 9 instruments in support of increased localisation, competitiveness
 - researching and developing the development-led industry.
- Strengthen provincial and rural innovation and production systems through analysis and catalytic interventions over the medium term by funding or co-funding 12 interventions that strengthen provincial or rural innovation systems.
- Enhance understanding and analysis that support improvements in the functioning and performance of the national system of innovation through executive committee approval by publishing 29 reports and policy briefings on the national system of innovation and innovation policy over the medium term.
- Introduce and manage interventions and incentive programmes that increase the level of private-sector investment in scientific or technological research and development by providing pre-approval decisions, within 90 days of the date of receipt of applications, for the research and development tax incentive over the medium term.

Subprogrammes

- *Sector Innovation and Green Economy* provides policy, strategy and direction for research and the development-led growth of strategic sectors of the economy; and supports the transition to a green economy.
- *Innovation for Inclusive Development* supports the development of science and technology-based innovations for tackling poverty, including the creation of sustainable jobs and human settlements, and the enhanced delivery of basic services.
- *Science and Technology Investment* leads and supports the development of indicators and instruments for monitoring investments in science and technology, the performance of the national system of innovation, and ways of strengthening policy in relation to the national system of innovation.
- *Technology Localisation, Beneficiation and Advanced Manufacturing* funds technology and innovation development programmes to advance strategic medium- and long-term sustainable economic growth and sector development priorities, as well as service delivery.
- *Office of the Deputy Director-General: Socioeconomic Innovation Partnerships* provides management and administrative support to the programme and the deputy director-general.

Expenditure trends and estimates

Table 30.13 Socioeconomic Innovation Partnerships expenditure trends and estimates by subprogramme and economic classification

Subprogramme	Audited outcome			Adjusted appropriation	Average growth rate (%)		Medium-term expenditure estimate			Average growth rate (%)	
	2015/16	2016/17	2017/18		2018/19	2015/16 - 2018/19	2019/20	2020/21	2021/22	2018/19 - 2021/22	Average: Expenditure/ Total (%)
R million											
Sector Innovation and Green Economy	873.9	932.0	996.0	1 036.8	5.9%	55.6%	1 046.0	1 103.7	1 145.9	3.4%	58.6%
Innovation for Inclusive Development	334.5	344.5	356.7	354.8	2.0%	20.1%	367.8	390.7	408.5	4.8%	20.6%
Science and Technology Investment	32.3	22.2	22.2	27.3	-5.4%	1.5%	34.9	37.1	44.2	17.4%	1.9%
Technology Localisation, Beneficiation and Advanced Manufacturing	497.7	465.3	237.0	359.3	-10.3%	22.6%	372.3	393.1	265.6	-9.6%	18.8%
Office of the Deputy Director-General: Socioeconomic Innovation Partnership	4.8	4.6	4.2	-	-100.0%	0.2%	3.5	3.5	3.6	-	0.1%
Total	1 743.1	1 768.6	1 616.1	1 778.3	0.7%	100.0%	1 824.4	1 928.2	1 867.9	1.7%	100.0%
Change to 2018 Budget estimate				-			(57.9)	(58.6)	(62.4)		
Economic classification											
Current payments	48.1	51.3	48.8	52.6	4.5%	2.9%	58.3	62.5	66.4	6.6%	3.3%
Compensation of employees	41.0	41.0	42.4	43.0	3.2%	2.5%	48.6	52.2	55.9	7.3%	2.7%
Goods and services ¹	7.0	10.3	6.4	9.7	11.1%	0.5%	9.7	10.2	10.6	3.0%	0.5%
of which:											
Advertising	0.0	0.0	0.2	0.2	231.7%	-	0.2	0.2	0.3	4.8%	-
Catering: Departmental activities	0.1	0.1	0.3	0.3	30.4%	-	0.3	0.3	0.4	6.4%	-
Communication	0.4	0.8	1.0	1.0	42.5%	-	1.2	1.2	1.3	6.8%	0.1%
Consultants: Business and advisory services	0.0	0.4	0.7	3.7	511.6%	0.1%	2.8	3.1	3.1	-4.9%	0.2%
Travel and subsistence	3.3	3.1	2.9	3.0	-3.2%	0.2%	3.7	3.8	3.9	9.5%	0.2%
Venues and facilities	0.5	0.0	0.9	0.9	21.6%	-	0.9	0.9	1.0	2.4%	-

Table 30.13 Socioeconomic Innovation Partnerships expenditure trends and estimates by subprogramme and economic classification

Economic classification	Audited outcome			Adjusted appropriation	Average growth rate (%)		Medium-term expenditure estimate			Average growth rate (%)	
	2015/16	2016/17	2017/18		2018/19	2015/16 - 2018/19	2019/20	2020/21	2021/22	2018/19 - 2021/22	Average Expenditure/ Total (%)
R million											
Transfers and subsidies¹	1 695.0	1 717.3	1 567.3	1 725.6	0.6%	97.1%	1 766.1	1 865.7	1 801.5	1.5%	96.7%
Departmental agencies and accounts	425.0	444.2	384.4	568.7	10.1%	26.4%	588.5	623.4	507.8	-3.6%	30.9%
Higher education institutions	14.6	14.6	–	–	-100.0%	0.4%	–	–	–	–	–
Public corporations and private enterprises	1 199.0	1 207.4	1 157.1	1 156.9	-1.2%	68.4%	1 177.6	1 242.3	1 293.6	3.8%	65.8%
Non-profit institutions	56.3	51.0	25.8	–	-100.0%	1.9%	–	–	–	–	–
Households	0.1	0.1	0.0	–	-100.0%	–	–	–	–	–	–
Total	1 743.1	1 768.6	1 616.1	1 778	0.7%	100.0%	1 824.4	1 928.2	1 867.9	1.7%	100.0%
Proportion of total programme expenditure to vote expenditure	23.4%	24.0%	21.6%	22.3%	–	–	22.4%	22.4%	21.0%	–	–
Details of selected transfers and subsidies											
Departmental agencies and accounts											
Departmental agencies (non-business entities)											
Current	425.0	444.2	384.4	568.7	10.1%	26.4%	588.5	623.4	507.8	-3.6%	30.9%
Various institutions: Economic competitiveness and support package: Local manufacturing capacity research and technical support	–	–	–	80.0	–	1.2%	80.0	84.4	–	-100.0%	3.3%
Various institutions: Economic competitiveness and support package: Local systems of innovation for the cold chain technologies project	–	–	–	62.0	–	0.9%	62.0	65.4	–	-100.0%	2.6%
Various institutions: Innovative research and development	13.8	6.9	35.0	39.9	42.5%	1.4%	42.0	46.7	50.7	8.3%	2.4%
Human Sciences Research Council	288.7	290.1	304.7	303.7	1.7%	17.2%	313.9	331.2	344.1	4.3%	17.5%
Various institutions: Local manufacturing capacity research and technical support	42.0	70.7	3.3	25.9	-14.9%	2.1%	28.7	30.3	34.2	9.7%	1.6%
Various institutions: Local systems of innovation for the cold chain technologies project	60.0	64.0	30.7	10.6	-43.8%	2.4%	11.8	12.4	15.8	14.1%	0.7%
Various institutions: Resource-based industries research and development	1.3	1.0	–	–	-100.0%	–	–	–	–	–	–
National Research Foundation: Research information management system	12.2	7.2	–	4.0	-31.1%	0.3%	8.4	8.9	11.7	43.0%	0.4%
Human Sciences Research Council: Develop and monitor science and technology indicators	5.4	–	7.0	10.0	22.4%	0.3%	12.4	13.1	16.4	18.1%	0.7%
Various institutions: Environmental innovation	1.5	4.2	3.8	32.6	174.3%	0.6%	29.4	31.0	34.9	4.7%	1.7%
Public corporations and private enterprises											
Public corporations											
Other transfers to public corporations											
Current	336.5	335.4	228.1	193.8	-16.8%	15.8%	211.7	223.4	241.3	7.6%	11.8%
Various institutions: Advanced manufacturing technology strategy implementation	–	43.1	51.2	53.7	–	2.1%	59.5	62.8	67.3	7.8%	3.3%
Council for Scientific and Industrial Research	–	–	4.0	–	–	0.1%	–	–	–	–	–
Various institutions: Innovative research and development	12.3	19.3	5.2	–	-100.0%	0.5%	–	–	–	–	–
Various institutions: ICT	26.1	21.8	45.8	28.6	3.1%	1.8%	38.5	40.7	44.4	15.8%	2.1%
Various institutions: Local manufacturing capacity research and technical support	143.1	141.9	–	–	-100.0%	4.1%	–	–	–	–	–
Council for Scientific and Industrial Research: Mining research and development	–	–	24.1	63.0	–	1.3%	60.0	63.3	68.2	2.7%	3.4%
Various institutions: Local systems of innovation for the cold chain technologies project	104.8	54.4	–	–	-100.0%	2.3%	–	–	–	–	–
Various institutions: Resource-based industries research and development	45.2	41.1	97.9	48.4	2.3%	3.4%	53.7	56.6	61.3	8.2%	3.0%
Various institutions: Environmental innovation	4.9	13.7	–	–	-100.0%	0.3%	–	–	–	–	–

Table 30.13 Socioeconomic Innovation Partnerships expenditure trends and estimates by subprogramme and economic classification

Details of selected transfers and subsidies											
R million	Audited outcome			Adjusted appropriation	Average growth rate (%)	Average: Expenditure/ Total (%)	Medium-term expenditure estimate			Average growth rate (%)	Average: Expenditure/ Total (%)
	2015/16	2016/17	2017/18				2018/19	2019/20	2020/21		
Higher education institutions											
Current	14.6	14.6	-	-	-100.0%	0.4%	-	-	-	-	-
Various institutions: Advanced manufacturing technology strategy implementation	2.9	0.3	-	-	-100.0%	-	-	-	-	-	-
Various institutions: Innovative research and development	4.5	8.0	-	-	-100.0%	0.2%	-	-	-	-	-
Various institutions: Local manufacturing capacity research and technical support	2.4	2.0	-	-	-100.0%	0.1%	-	-	-	-	-
Various institutions: Local systems of innovation for the cold chain technologies project	3.5	4.3	-	-	-100.0%	0.1%	-	-	-	-	-
Various institutions: Resource-based industries research and development	1.3	-	-	-	-100.0%	-	-	-	-	-	-
Non-profit institutions											
Current	56.3	51.0	25.8	-	-100.0%	1.9%	-	-	-	-	-
Various institutions: Advanced manufacturing technology strategy implementation	0.1	0.1	8.1	-	-100.0%	0.1%	-	-	-	-	-
Various institutions: Innovative research and development	8.1	8.9	-	-	-100.0%	0.2%	-	-	-	-	-
Various institutions: Local systems of innovation for the cold chain technologies project	36.4	30.3	-	-	-100.0%	1.0%	-	-	-	-	-
Various institutions: Resource-based industries research and development	1.7	1.7	-	-	-100.0%	-	-	-	-	-	-
Various institutions: Environmental innovation	10.1	10.0	17.7	-	-100.0%	0.5%	-	-	-	-	-
Public corporations and private enterprises											
Private enterprises											
Other transfers to private enterprises											
Current	42.2	-	13.3	-	-100.0%	0.8%	-	-	-	-	-
Various institutions: Advanced manufacturing technology strategy implementation	42.2	-	13.3	-	-100.0%	0.8%	-	-	-	-	-
Public corporations and private enterprises											
Public corporations											
Public corporations (subsidies on products and production)											
Current	820.2	872.0	915.6	963.2	5.5%	51.7%	965.8	1 018.9	1 052.3	3.0%	54.1%
Council for Scientific and Industrial Research	820.2	872.0	915.6	963.2	5.5%	51.7%	965.8	1 018.9	1 052.3	3.0%	54.1%

1. Estimates of National Expenditure data tables are available and can be downloaded from www.treasury.gov.za. These data tables contain detailed information by goods and services, and transfers and subsidies item by programme.

Entities

Council for Scientific and Industrial Research

Mandate

The Council for Scientific and Industrial Research was established in 1945 and is governed in terms of the Scientific Research Council Act (1988). The council fosters industrial and scientific development in the national interest through multidisciplinary research and technological innovation.

Selected performance indicators**Table 30.14 Council for Scientific and Industrial Research performance indicators by programme/objective/activity and related outcome**

Indicator	Programme/Objective/Activity	MTSF outcome	Past			Current	Projections		
			2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
Number of journal articles published per year	Council for Scientific and Industrial Research science, engineering and technology operating units and centres	Outcome 5: A skilled and capable workforce to support an inclusive growth path	300	300	317	310	310	320	340
Number of conference papers delivered per year	Council for Scientific and Industrial Research science, engineering and technology operating units and centres		290	290	325	335	340	345	350
Number of new technology demonstrators per year	Council for Scientific and Industrial Research science, engineering and technology operating units and centres	Outcome 4: Decent employment through inclusive growth	30	40	60	50	55	55	55
Amount of contract research and development income per year	Council for Scientific and Industrial Research science, engineering and technology operating units and centres		R1.9bn	R1.9bn	R1.8bn	R2bn	R2.1bn	R2.2bn	R2.4bn
Number of science, engineering and technology staff per year	Council for Scientific and Industrial Research science, engineering and technology operating units and centres	Outcome 5: A skilled and capable workforce to support an inclusive growth path	1 850	1 966	1 850	1 860	1 860	1 950	2 150
Percentage of black science, engineering and technology staff per year	Council for Scientific and Industrial Research science, engineering and technology operating units and centres		57% (1 055/ 1 850)	60% (1 180/ 1 966)	61% (1 129/ 1 850)	62% (1 153/ 1 860)	63% (1 172/ 1 860)	64% (1 248/ 1 950)	72% (1 398/ 1 950)
Number of science, engineering and technology staff with doctorates per year	Council for Scientific and Industrial Research science, engineering and technology operating units and centres		330	351	339	369	390	430	510
Number of new patents granted per year	Council for Scientific and Industrial Research science, engineering and technology operating units and centres	Outcome 4: Decent employment through inclusive growth	15	15	19	15	15	15	15

Expenditure analysis

Over the medium term, the Council for Scientific and Industrial Research will focus on conducting high-quality and relevant research, and pursuing technological innovation to foster industrial and scientific development. In its continuing effort to develop, renew and transform the science, engineering and technology base, the council plans to provide knowledge solutions for the inclusive and sustainable advancement of industry and society, and foster strategic partnerships for the development of innovative and technological capabilities for local industries. In addition, the council expects to build on current industrial development opportunities such as pharmaceutical innovation and agro-processing. As part of its strategic intent for innovation, the council will focus on striking the right balance between scientific development and industrial development.

To achieve these objectives, over the period ahead, the council plans to implement a range of research, development and innovation programmes in areas such as health, energy, defence and security. Spending on these activities is expected to amount to R2.5 billion over the MTEF period.

As the nature of the council's work requires highly specialised skills and is labour intensive, spending on compensation of employees accounts for 56.5 per cent (R5.4 billion) of total expenditure over the medium term. Spending on compensation of employees is projected to increase at an average annual rate of 5.7 per cent, from R1.6 billion in 2018/19 to R1.9 billion in 2021/22, as the council capacitates the newly launched biorefinery industry development and photonics prototyping facilities.

Total revenue is projected to be R9.8 billion over the medium term, of which 40.2 per cent (R4 billion) is derived from transfers from the department. Transfers from the department are expected to increase at an average annual rate of 3.5 per cent, from R1.3 billion in 2018/19 to R1.4 billion in 2021/22. The remaining revenue is generated from services rendered and other revenue streams, which include contract research and development income from local and international public and private sectors, income from intellectual property, and proceeds from technology transfer proceeds. The council expects to achieve a net profit of R267 million

over the MTEF period, which it plans to invest in property, plant and equipment.

Programmes/objectives/activities

Table 30.15 Council for Scientific and Industrial Research expenditure trends and estimates by programme/objective/activity

R million	Audited outcome			Revised estimate 2018/19	Average growth rate (%) 2015/16 - 2018/19	Average Expenditure/Total (%) 2015/16 - 2018/19	Medium-term expenditure estimate			Average growth rate (%) 2018/19 - 2021/22	Average Expenditure/Total (%) 2018/19 - 2021/22
	2015/16	2016/17	2017/18				2019/20	2020/21	2021/22		
Administration	372.7	391.1	374.8	432.3	5.1%	14.5%	544.7	567.8	598.8	11.5%	17.2%
Council for Scientific and Industrial Research science, engineering and technology operating units and centres	2 323.6	2 277.4	2 182.4	2 471.2	2.1%	85.5%	2 481.4	2 586.8	2 727.9	3.3%	82.8%
Total	2 696.3	2 668.5	2 557.2	2 903.5	2.5%	100.0%	3 026.1	3 154.6	3 326.7	4.6%	100.0%

Statements of historical financial performance and position

Table 30.16 Council for Scientific and Industrial Research statements of historical financial performance and position

Statement of financial performance									
R million	Budget	Audited outcome	Budget	Audited outcome	Budget	Audited outcome	Budget estimate	Revised estimate	Average Outcome/Budget (%)
	2015/16	2016/17	2016/17	2017/18	2017/18	2018/19	2018/19	2015/16 - 2018/19	
Revenue									
Non-tax revenue	1 878.6	2 067.2	2 039.6	2 031.7	2 185.4	1 821.5	2 348.7	2 134.8	95.3%
Sale of goods and services other than capital assets	1 832.4	1 970.3	1 998.6	1 937.1	2 143.9	1 776.1	2 308.0	1 973.5	92.4%
<i>of which:</i>									
<i>Sales by market establishment</i>	1 832.4	1 970.3	1 998.6	1 937.1	2 143.9	1 776.1	2 308.0	1 973.5	92.4%
Other non-tax revenue	46.2	96.9	41.0	94.7	41.5	45.4	40.7	161.2	235.2%
Transfers received	795.0	680.5	815.6	714.1	835.7	722.4	879.7	1 262.5	101.6%
Total revenue	2 673.6	2 747.7	2 855.2	2 745.8	3 021.1	2 543.9	3 228.4	3 397.3	97.1%
Expenses									
Current expenses	2 610.4	2 694.8	2 793.1	2 668.5	2 958.9	2 557.2	3 159.2	2 903.5	93.9%
Compensation of employees	1 455.0	1 468.2	1 541.2	1 487.9	1 671.3	1 538.9	1 787.2	1 624.3	94.8%
Goods and services	1 103.8	1 163.7	1 194.2	1 109.9	1 222.2	952.4	1 302.6	1 195.9	91.7%
Depreciation	51.6	54.5	57.8	61.7	65.5	65.9	69.4	83.3	108.7%
Interest, dividends and rent on land	–	8.4	–	9.0	–	–	–	–	–
Total expenses	2 610.4	2 696.3	2 793.1	2 668.5	2 958.9	2 557.2	3 159.2	2 903.5	94.0%
Surplus/(Deficit)	63.0	51.0	62.0	77.0	62.0	(13.0)	69.0	494.0	
Statement of financial position									
Carrying value of assets	784.4	753.7	813.4	762.9	841.3	784.4	873.8	791.9	93.4%
<i>of which:</i>									
<i>Acquisition of assets</i>	(99.9)	(100.5)	(117.5)	(72.0)	(143.8)	(87.4)	(102.0)	(106.1)	79.0%
Investments	16.5	7.6	18.1	20.2	20.7	9.1	25.1	19.0	69.5%
Inventory	103.6	106.0	106.9	85.4	107.9	113.7	118.7	113.6	95.8%
Receivables and prepayments	247.9	252.5	264.4	281.9	280.2	224.7	299.8	294.9	96.5%
Cash and cash equivalents	810.7	1 012.9	793.7	1 106.5	798.0	1 100.6	806.9	815.6	125.7%
Non-current assets held for sale	–	27.6	–	–	–	–	–	–	–
Total assets	1 963.1	2 160.2	1 996.5	2 256.9	2 048.0	2 232.4	2 124.3	2 035.0	106.8%
Accumulated surplus/(deficit)	942.4	930.5	992.6	1 007.8	1 088.3	994.5	1 157.5	985.8	93.7%
Deferred income	–	23.5	–	4.2	–	11.2	–	–	–
Trade and other payables	1 009.1	1 195.5	991.3	1 234.1	945.9	1 215.7	952.1	1 038.4	120.1%
Provisions	11.6	10.7	12.7	10.8	13.8	11.0	14.8	10.9	82.0%
Total equity and liabilities	1 963.1	2 160.2	1 996.5	2 256.9	2 048.0	2 232.4	2 124.3	2 035.0	106.8%

Statements of estimates of financial performance and position**Table 30.17 Council for Scientific and Industrial Research statements of estimates of financial performance and position**

Statement of financial performance	Revised estimate	Average growth rate (%)	Average: Expenditure/ Total (%)	Medium-term estimate			Average growth rate (%)	Average: Expenditure/ Total (%)
				2018/19	2019/20	2020/21		
R million								
Revenue								
Non-tax revenue	2 134.8	1.1%	70.9%	1 830.4	1 893.2	2 024.3	-1.8%	59.8%
Sale of goods and services other than capital assets	1 973.5	0.1%	67.5%	1 654.5	1 709.7	1 830.7	-2.5%	54.4%
<i>of which:</i>								
<i>Sales by market establishment</i>	1 973.5	0.1%	67.5%	1 654.5	1 709.7	1 830.7	-2.5%	54.4%
Other non-tax revenue	161.2	18.5%	3.4%	175.9	183.5	193.6	6.3%	5.4%
Transfers received	1 262.5	22.9%	29.1%	1 277.5	1 347.7	1 401.4	3.5%	40.2%
Total revenue	3 397.3	7.3%	100.0%	3 107.9	3 240.9	3 425.7	0.3%	100.0%
Expenses								
Current expenses	2 903.5	2.5%	100.0%	3 026.1	3 154.6	3 326.7	4.6%	100.0%
Compensation of employees	1 624.3	3.4%	56.6%	1 677.3	1 793.0	1 918.6	5.7%	56.5%
Goods and services	1 195.9	0.9%	40.8%	1 261.2	1 291.0	1 333.9	3.7%	41.0%
Depreciation	83.3	15.2%	2.4%	87.7	70.6	74.3	-3.8%	2.6%
Total expenses	2 903.5	2.5%	100.0%	3 026.1	3 154.6	3 326.7	4.6%	100.0%
Surplus/(Deficit)	494.0			82.0	86.0	99.0		
Statement of financial position								
Carrying value of assets	791.9	1.7%	35.7%	819.6	848.3	886.4	3.8%	38.6%
<i>of which:</i>								
<i>Acquisition of assets</i>	(106.1)	1.8%	-4.2%	(74.0)	(151.7)	(160.8)	14.9%	-5.6%
Investments	19.0	35.7%	0.6%	19.0	19.0	19.0	-	0.9%
Inventory	113.6	2.3%	4.8%	120.8	128.3	137.9	6.7%	5.8%
Receivables and prepayments	294.9	5.3%	12.2%	313.6	333.0	358.0	6.7%	15.0%
Cash and cash equivalents	815.6	-7.0%	46.3%	839.6	881.0	916.2	4.0%	39.8%
Total assets	2 035.0	-2.0%	100.0%	2 112.5	2 209.6	2 317.6	4.4%	100.0%
Accumulated surplus/(deficit)	985.8	1.9%	45.2%	985.8	985.8	993.3	0.3%	45.6%
Trade and other payables	1 038.4	-4.6%	53.9%	1 115.7	1 212.7	1 313.1	8.1%	53.8%
Provisions	10.9	0.5%	0.5%	11.0	11.1	11.2	1.0%	0.5%
Total equity and liabilities	2 035.0	-2.0%	100.0%	2 112.5	2 209.6	2 317.6	4.4%	100.0%

Personnel information**Table 30.18 Council for Scientific and Industrial Research personnel numbers and cost by salary level**

Number of posts estimated for 31 March 2019			Number and cost ¹ of personnel posts filled/planned for on funded establishment												Number				
Number of funded posts	Number of posts on approved establishment	Number of posts	Actual			Revised estimate			Medium-term expenditure estimate						Average growth rate (%)	Average: Salary level/Total (%)			
			2017/18	2018/19	2019/20	2020/21	2021/22	2019/20	2020/21	2021/22	2018/19 - 2021/22								
Council for Scientific and Industrial Research			Number	Cost	Unit cost	Number	Cost	Unit cost	Number	Cost	Unit cost	Number	Cost	Unit cost	Number	Cost	Unit cost		
Salary level	3 170	3 170	3 170	1 538.9	0.5	3 170	1 624.3	0.5	3 170	1 677.3	0.5	3 323	1 793.0	0.5	3 323	1 918.6	0.6	5.7%	100.0%
1 – 6	695	695	695	63.4	0.1	695	66.9	0.1	695	69.1	0.1	736	73.8	0.1	736	79.0	0.1	5.7%	22.0%
7 – 10	1 531	1 531	1 531	572.9	0.4	1 531	604.7	0.4	1 531	624.4	0.4	1 603	667.5	0.4	1 603	714.3	0.4	5.7%	48.3%
11 – 12	453	453	453	326.6	0.7	453	344.7	0.8	453	356.0	0.8	475	380.5	0.8	475	407.2	0.9	5.7%	14.3%
13 – 16	470	470	470	531.1	1.1	470	560.5	1.2	470	578.8	1.2	488	618.8	1.3	488	662.1	1.4	5.7%	14.8%
17 – 22	21	21	21	45.0	2.1	21	47.5	2.3	21	49.0	2.3	21	52.4	2.5	21	56.1	2.7	5.7%	0.6%

1. Rand million.

National Research Foundation**Mandate**

The National Research Foundation was established in terms of the National Research Foundation Act (1998), as amended. In terms of the National Research Foundation Amendment Bill (2016), the organisation is mandated to support research through funding, human resource development and the provision of research facilities to enable knowledge creation, innovation and development in all fields of science and technology, and promote indigenous knowledge.

Selected performance indicators**Table 30.19 National Research Foundation performance indicators by programme/objective/activity and related outcome**

Indicator	Programme/Objective/Activity	MTSF outcome	Past			Current	Projections		
			2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
Number of members of the public reached through interactions focusing on science awareness activities per year	Science engagement	Entity mandate	1 013 716	1 084 760	1 191 892	1 080 000	680 300 ¹	682 150 ¹	683 300
Number of black researchers funded per year	Research and innovation support and advancement		1 355	1 563	1 698	2 182	2 154	2 295	2 368
Number of female researchers funded per year	Research and innovation support and advancement		1 610	1 699	1 698	1 520	1 478	2 423	2 496
Number of black postgraduate students funded per year	Research and innovation support and advancement	Outcome 5: A skilled and capable workforce to support an inclusive growth path	8 980	10 747	11 328	9 350	9 418	9 941	10 079
Number of female postgraduate students funded per year	Research and innovation support and advancement		7 032	8 017	8 266	7 119	6 479	6 969	7 064
Number of masters students supported per year	Research and innovation support and advancement		4 853	4 995	5 435	4 582	3 706	3 892	3 938
Number of doctoral students supported per year	Research and innovation support and advancement		3 181	3 363	3 519	3 066	2 941	3 075	3 110
Number of researchers rated through the National Research Foundation system per year	Research and innovation support and advancement		3 369	3 663	3 885	3 750	3 900	4 050	4 200
Number of active grants emanating from binational, multinational and agency-to-agency agreements per year	Research and innovation support and advancement	Entity mandate	1 161	1 008	996	990	945	950	955
Number of users of equipment funded by the national equipment programme and national nanotechnology programme per year	Research and innovation support and advancement	Outcome 6: An efficient, competitive and responsive economic infrastructure network	2 360	2 937	2 881	2 641	593 ²	1 843 ²	884
Number of publications emanating from the usage of equipment funded by the national equipment programme and national nanotechnology programme per year	Research and innovation support and advancement		1 105	779	908	695	593 ³	485 ³	233
Number of Web of Science publications in nuclear, biodiversity, conservation and environment at the National Research Foundation's facilities per year	National research infrastructure platforms	Entity mandate	275	321	574	397	558 ¹	583 ¹	624 ¹

1. Targets decrease in line with available budget.

2. Due to a significant change in the budget allocation for new equipment grants, the foundation will service only 41 per cent of the demand for equipment support over the medium term.

3. Decrease in the number of publications emanating from the usage of national equipment programme due to a change in budget allocation.

Expenditure analysis

The National Research Foundation executes its mandate through the National Research Foundation Strategy 2020, a five-year plan in its final year of implementation. Over the medium term, the foundation plans to continue striving to become a globally competitive institution by focusing on research and development in support of human capacity, knowledge generation and innovation.

The foundation provides support across the full spectrum of current and future knowledge workers' careers, particularly for highly qualified technicians. This is achieved through a human capacity development pipeline, which informs the support for next-generation researchers, emerging researchers and established researchers. Accordingly, the foundation expects to invest 36 per cent (R2.8 billion) of its total human capital development budget over the MTEF period in developing the next generation of researchers. It intends to do this by awarding scholarships and bursaries; and offering academic development programmes to honours, masters, doctoral and postdoctoral students. R880.6 million has been earmarked for this purpose in 2019/20, when the foundation expects to support 3 706 masters and 2 941 doctoral students.

Advanced infrastructure is a key enabler of globally competitive research, development and innovation. As such, an estimated R4.6 billion over the MTEF period will provide unique national research facilities in the nuclear sciences, biodiversity, astronomy and geosciences fields that require highly qualified technicians. A further R2.4 billion over the period has been earmarked for the Square Kilometre Array, which will be the world's largest and most sensitive radio telescope.

Over the medium term, the foundation expects to receive an estimated 79 per cent (R11.2 billion) of its revenue through a parliamentary grant; and the remainder through contract funding from the Department of Science and Technology, and other government departments and entities. The parliamentary funding includes an additional R167.9 million set aside for maintaining and enhancing the research and training activities of iThemba Laboratories in 2018/19.

Programmes/objectives/activities

Table 30.20 National Research Foundation expenditure trends and estimates by programme/objective/activity

R million	Audited outcome			Revised estimate 2018/19	Average growth rate (%)		Medium-term expenditure estimate			Average growth rate (%) 2018/19 - 2021/22	Average Expenditure/ Total (%) 2018/19 - 2021/22
	2015/16	2016/17	2017/18		2015/16 - 2018/19	2019/20	2020/21	2021/22			
Administration	82.2	85.0	89.7	126.6	15.5%	2.4%	126.7	133.9	142.0	3.9%	3.0%
Science engagement	163.9	169.5	169.9	125.2	-8.6%	3.9%	118.4	118.5	132.5	1.9%	2.8%
Research and innovation support and advancement	2 645.2	2 690.5	2 793.8	2 504.2	-1.8%	66.4%	2 799.4	2 846.5	2 805.1	3.9%	61.5%
National research infrastructure platforms	394.7	430.0	1 140.8	1 272.4	47.7%	20.0%	1 413.1	1 467.0	1 712.1	10.4%	32.8%
National research facilities: Astronomy	514.0	637.9	-	-	-100.0%	7.4%	-	-	-	-	-
Total	3 800.1	4 013.0	4 194.2	4 028.4	2.0%	100.0%	4 457.6	4 565.9	4 791.7	6.0%	100.0%

Statements of historical financial performance and position

Table 30.21 National Research Foundation statements of historical financial performance and position

Statement of financial performance									
R million	Audited outcome		Audited outcome		Audited outcome		Budget estimate	Revised estimate	Average: Outcome/Budget (%) 2015/16 - 2018/19
	Budget	2015/16	Budget	2016/17	Budget	2017/18			
Revenue									
Non-tax revenue	1 307.5	1 487.1	1 241.6	1 383.0	1 237.5	1 416.8	630.3	1 011.5	120.0%
Sale of goods and services other than capital assets	122.0	127.6	130.5	106.7	129.7	115.3	65.8	65.8	92.7%
<i>of which:</i>									
<i>Sales by market establishment</i>	69.1	72.1	76.6	68.0	81.7	80.6	63.6	63.6	97.7%
<i>Other sales</i>	52.8	55.4	53.9	38.7	48.0	34.7	2.1	2.1	83.5%
Other non-tax revenue	1 185.5	1 359.6	1 111.1	1 276.3	1 107.8	1 301.4	564.5	945.7	123.0%
Transfers received	2 877.1	2 675.5	3 197.8	3 118.2	3 378.1	3 309.8	3 691.4	3 478.2	95.7%
Total revenue	4 184.6	4 162.6	4 439.4	4 501.1	4 615.6	4 726.5	4 321.7	4 489.6	101.8%
Expenses									
Current expenses	1 308.6	1 243.4	1 362.2	1 415.0	1 459.6	1 474.1	1 579.2	1 577.8	100.0%
Compensation of employees	666.4	577.9	678.8	627.1	750.0	717.8	791.9	792.0	94.0%
Goods and services	563.1	573.8	585.5	663.1	596.9	601.5	637.5	636.0	103.8%
Depreciation	79.0	91.6	97.9	124.7	112.7	154.8	149.8	149.8	118.5%
Interest, dividends and rent on land	0.0	0.1	0.0	0.0	0.0	0.0	-	-	233.3%
Transfers and subsidies	2 394.5	2 556.7	2 460.5	2 598.0	2 504.6	2 720.1	2 509.2	2 450.6	104.6%
Total expenses	3 703.1	3 800.1	3 822.6	4 013.0	3 964.2	4 194.2	4 088.4	4 028.4	102.9%
Surplus/(Deficit)	481.0	362.0	617.0	488.0	651.0	532.0	233.0	461.0	
Statement of financial position									
Carrying value of assets	1 862.0	1 708.3	2 353.6	2 209.7	2 873.0	2 745.4	3 106.3	3 216.1	96.9%
<i>of which:</i>									
<i>Acquisition of assets</i>	(565.9)	(440.0)	(741.7)	(630.0)	(776.0)	(694.1)	(383.1)	(620.5)	96.7%
Investments	25.8	22.8	20.0	18.4	17.0	16.1	15.0	15.0	93.1%
Inventory	6.5	6.2	6.5	7.1	6.3	6.1	3.4	3.4	100.4%
Receivables and prepayments	1 000.8	1 500.4	986.4	1 513.0	945.7	1 080.8	874.1	890.1	130.9%
Cash and cash equivalents	648.4	671.5	589.1	494.8	510.0	463.4	505.0	505.0	94.8%
Defined benefit plan assets	0.5	1.5	1.3	3.7	1.2	4.0	1.0	4.2	338.1%
Total assets	3 544.0	3 910.6	3 956.9	4 246.7	4 353.2	4 315.9	4 504.7	4 633.7	104.6%

Table 30.21 National Research Foundation statements of historical financial performance and position

Statement of financial position								Average: Outcome/ Budget (%)	
	Budget	Audited outcome	Budget	Audited outcome	Budget	Audited outcome	Budget estimate	Revised estimate	
R million	2015/16		2016/17		2017/18		2018/19		2015/16 - 2018/19
Accumulated surplus/(deficit)	–	4.1	–	0.4	–	2.6	–	–	–
Capital and reserves	97.7	104.1	78.3	94.5	83.1	89.0	82.1	82.1	108.4%
Capital reserve fund	1 862.0	1 708.3	2 353.6	2 209.7	2 873.0	2 745.4	3 106.3	3 216.1	96.9%
Finance lease	0.6	0.2	0.2	0.2	0.2	0.1	0.2	0.1	47.9%
Deferred income	1 478.8	1 972.0	1 420.4	1 798.7	1 294.4	1 335.9	1 225.1	1 232.0	117.0%
Trade and other payables	96.0	103.7	94.9	134.8	94.5	107.7	82.6	95.0	119.9%
Provisions	8.9	18.1	9.4	8.4	8.0	35.2	8.5	8.5	201.6%
Total equity and liabilities	3 544.0	3 910.6	3 956.9	4 246.7	4 353.2	4 315.9	4 504.7	4 633.7	104.6%

Statements of estimates of financial performance and position**Table 30.22 National Research Foundation statements of estimates of financial performance and position**

Statement of financial performance		Average growth rate (%)	Average: Expen- diture/ Total (%)	Medium-term estimate			Average growth rate (%)	Average: Expen- diture/ Total (%)
	Revised estimate			2019/20	2020/21	2021/22		
R million	2018/19	2015/16 - 2018/19					2018/19 - 2021/22	
Revenue								
Non-tax revenue	1 011.5	-12.1%	29.7%	1 010.7	919.1	956.4	-1.8%	21.0%
Sale of goods and services other than capital assets	65.8	-19.8%	2.3%	67.9	70.8	76.2	5.0%	1.5%
<i>of which:</i>								
<i>Sales by market establishment</i>	63.6	-4.1%	1.6%	66.2	68.6	73.9	5.1%	1.5%
<i>Other sales</i>	2.1	-66.2%	0.7%	1.7	2.2	2.3	2.9%	0.0%
Other non-tax revenue	945.7	-11.4%	27.4%	942.8	848.3	880.2	-2.4%	19.5%
Transfers received	3 478.2	9.1%	70.3%	3 605.5	3 765.8	3 826.1	3.2%	79.0%
Total revenue	4 489.6	2.6%	100.0%	4 616.2	4 684.8	4 782.6	2.1%	100.0%
Expenses								
Current expenses	1 577.8	8.3%	35.6%	1 727.4	1 799.0	1 923.2	6.8%	39.4%
Compensation of employees	792.0	11.1%	16.9%	870.6	936.8	995.4	7.9%	20.1%
Goods and services	636.0	3.5%	15.4%	675.5	670.4	724.5	4.4%	15.2%
Depreciation	149.8	17.8%	3.2%	181.4	191.8	203.3	10.7%	4.1%
Transfers and subsidies	2 450.6	-1.4%	64.4%	2 730.2	2 766.9	2 868.6	5.4%	60.6%
Total expenses	4 028.4	2.0%	100.0%	4 457.6	4 565.9	4 791.7	6.0%	100.0%
Surplus/(Deficit)	461.0			159.0	119.0	(9.0)		
Statement of financial position								
Carrying value of assets	3 216.1	23.5%	57.2%	3 365.1	3 474.6	3 454.3	2.4%	72.5%
<i>of which:</i>								
<i>Acquisition of assets</i>	(620.5)	12.1%	-13.9%	(330.3)	(301.3)	(183.0)	-33.4%	-7.7%
Investments	15.0	-13.0%	0.4%	14.0	12.0	11.0	-9.8%	0.3%
Inventory	3.4	-18.5%	0.1%	3.3	3.2	3.3	-1.0%	0.1%
Receivables and prepayments	890.1	-16.0%	29.6%	842.1	827.8	820.0	-2.7%	18.2%
Cash and cash equivalents	505.0	-9.1%	12.6%	406.0	388.0	350.0	-11.5%	8.9%
Defined benefit plan assets	4.2	42.3%	0.1%	4.3	4.0	4.0	-1.6%	0.1%
Total assets	4 633.7	5.8%	100.0%	4 634.7	4 709.6	4 642.6	0.1%	100.0%
Capital and reserves	82.1	-7.6%	2.2%	80.8	78.2	77.2	-2.0%	1.7%
Capital reserve fund	3 216.1	23.5%	57.2%	3 365.1	3 474.6	3 454.3	2.4%	72.5%
Finance lease	0.1	-27.7%	0.0%	0.1	0.1	0.1	-5.5%	0.0%
Deferred income	1 232.0	-14.5%	37.6%	1 090.1	1 059.7	1 016.8	-6.2%	23.6%
Trade and other payables	95.0	-2.9%	2.6%	90.0	88.0	85.0	-3.6%	1.9%
Provisions	8.5	-22.3%	0.4%	8.7	9.0	9.2	2.7%	0.2%
Total equity and liabilities	4 633.7	5.8%	100.0%	4 634.7	4 709.6	4 642.6	0.1%	100.0%

Personnel information

Table 30.23 National Research Foundation personnel numbers and cost by salary level

Number of posts estimated for 31 March 2019		Number and cost ¹ of personnel posts filled/planned for on funded establishment											Number						
Number of funded posts	Number of posts on approved establishment	Actual			Revised estimate			Medium-term expenditure estimate						Average growth rate (%)	Average: Salary level/Total (%)				
		2017/18		Unit cost	2018/19		Unit cost	2019/20		Unit cost	2020/21		Unit cost			2021/22		Unit cost	
National Research Foundation		Number	Cost	Unit cost	Number	Cost	Unit cost	Number	Cost	Unit cost	Number	Cost	Unit cost	Number	Cost	Unit cost	2018/19 - 2021/22		
Salary level	1 302	1 302	1 193	717.8	0.6	1 302	792.0	0.6	1 211	880.6	0.7	1 211	946.8	0.8	1 211	1 006.6	0.8	8.3%	100.0%
1 – 6	176	176	159	32.1	0.2	176	35.5	0.2	161	37.3	0.2	161	40.1	0.2	161	42.6	0.3	6.3%	13.4%
7 – 10	802	802	725	349.1	0.5	802	385.0	0.5	741	423.7	0.6	741	455.6	0.6	741	484.3	0.7	7.9%	61.3%
11 – 12	185	185	175	147.4	0.8	185	162.6	0.9	173	182.4	1.1	173	196.2	1.1	173	208.5	1.2	8.6%	14.3%
13 – 16	131	131	126	166.6	1.3	131	183.8	1.4	128	208.1	1.6	128	223.7	1.7	128	237.9	1.9	9.0%	10.4%
17 – 22	8	8	8	22.6	2.8	8	25.2	3.1	8	29.0	3.6	8	31.2	3.9	8	33.2	4.1	9.7%	0.6%

1. Rand million.

Other entities

Comprehensive coverage of the following entities is provided with more detailed information for the vote at www.treasury.gov.za under the budget information link.

- The **Academy of Science of South Africa** links South Africa with scientific communities at the highest levels in the SADC region, the rest of Africa and internationally; promotes common ground in scientific thinking across all disciplines; encourages and promotes innovative and independent scientific thinking; promotes the development of intellectual capacity in all people; provides effective scientific, evidence-based advice; and facilitates appropriate action in the public interest. The academy's total budget for 2019/20 is R37.2 million.
- The **Human Sciences Research Council** undertakes, promotes and coordinates research in the human and social sciences. The council's total budget for 2019/20 is R599.9 million.
- The **South African National Space Agency** was established in terms of the South African National Space Agency Act (2008) and came into existence in December 2010. The agency aims to be a key contributor to the South African earth observation strategy by providing space-based data platforms in collaboration with other entities that focus on in situ observation measurements such as the South African earth observation network. The agency's total budget for 2019/20 is R242.7 million.
- The **Technology Innovation Agency** draws its mandate from the Technology Innovation Agency Act (2008) and came into operation in April 2010. The agency was established as an intervention to improve research and development from higher education institutions, scientific councils, public entities and private companies, as well as commercialisation, thereby increasing technological innovation in the economy. The agency's total budget for 2019/20 is R589.8 million.

Additional table: Summary of expenditure on infrastructure

Project name	Service delivery outputs	Current project stage	Total project cost	Audited outcome			Adjusted appropriation	Medium-term expenditure estimate		
				2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
R million										
Infrastructure transfers to other spheres, agencies and departments										
Mega projects (total project cost of at least R1 billion over the project life cycle)										
Square Kilometre Array	Construction of telescopes	Construction	10 021.2	687.4	652.8	693.9	709.4	687.0	812.1	856.8
Large projects (total project cost of at least R250 million but less than R1 billion over the project life cycle)										
Space infrastructure	Construction of satellite	Construction	210.8	31.4	29.7	44.9	9.2	30.0	31.7	34.0
Hydrogen strategy	Purchase of equipment	Various	1 087.5	63.6	63.9	67.1	71.0	74.9	77.7	81.5
National nanotechnology centres	Equipping of centres	Various	246.1	50.4	50.7	81.5	–	–	–	–
Cyber-infrastructure	Creation of broadband network connectivity and high-performance computing	Various	2 822.1	213.5	214.5	413.3	236.3	251.7	260.8	273.8
Total			14 387.5	1 046.3	1 011.5	1 300.6	1 025.9	1 043.6	1 182.2	1 246.2