**Budgetary Review and Recommendation Report of the Portfolio Committee on Higher Education, Science and Innovation on the Performance of the Department of Science and Innovation for the 2021/22 Financial Year, Dated 4 November 2022**

**The Portfolio Committee on Higher Education, Science and Innovation, having considered the performance of the Department of Science and Innovation, Council for Scientific and Industrial Research, Human Sciences Research Council, National Research Foundation, South African National Space Agency and the Technology Innovation Agency for the 2021/22 financial year, reports as follows:**

1. **Introduction**
	1. **Mandate of the Portfolio Committee on Higher Education, Science and Innovation**

The Portfolio Committee on Higher Education, Science and Innovation (hereafter, the Committee) is mandated by the Constitution and the Rules of Parliament to oversee the activities and performance of the Department of Science and Innovation (hereafter, the Department or DSI) and the entities that report to it. Furthermore, the Committee must consider, amend and/or initiate legislation; consider international agreements and provide a platform for the public to present views on issues and/or legislation specific to the science, technology and innovation (STI) system.

* 1. **Purpose of and method to develop the 2022 Budgetary Review and Recommendation Report of the Portfolio Committee on Higher Education, Science and Innovation**

To enhance Parliament’s oversight role, the Money Bills Amendment Procedure and Related Matters Act (No. 9 of 2009) was promulgated to provide Parliament with a procedure to make recommendations to the Minister of Finance to amend the budget of a national department. A key provision of this Act is that Portfolio Committees must annually compile Budgetary Review and Recommendation (BRR) Reports. These BRR Reports provide an assessment of service delivery performance given available resources; evaluates the effective and efficient use of resources; and may make recommendations on the forward use of resources. The BRR Reports are also source documents for the Committees on Appropriations when they make recommendations to the Houses of Parliament on the Medium-Term Budget Policy Statement (MTBPS).

Accordingly, the Committee considered the Department and entities’ 2021/22 Annual Performance Plans, budget allocations, quarterly performance and expenditure trends, and conducted oversight by having briefings on specific initiatives and programmes. On 19 and 21 October 2022, the Committee considered the 2021/22 Annual Reports of the Department, Council for Scientific and Industrial Research (CSIR), Human Sciences Research Council (HSRC), National Research Foundation (NRF), South African National Space Agency (SANSA) and the Technology Innovation Agency (TIA). The Committee also invited the Financial and Fiscal Commission (FFC) and the Auditor-General of South Africa (AGSA) to provide an analysis of the budget and performance, and explain the audit outcomes of the science and innovation portfolio, respectively.

1. **POLICY CONTEXT**
	1. **National Development Plan and Medium-Term Strategic Framework**

Science, technology and innovation are considered crucial for the creation of wealth and improving the quality of life in modern society, and countries that increase their investment in STI during times of economic crisis fared better in recovering from its effects than those that maintain or decrease STI investment levels. The National Development Plan (NDP) 2030 identifies the need to increase the size, coherence and effectiveness of the National System of Innovation (NSI) because STI is crucial for national development. Hence, the country must enhance its investment in infrastructure, improve the skills base and ensure that it better exploits the knowledge generated from its investments in research, development and innovation (RDI). This requires that, among others:

* South Africa invests more in research and development (R&D);
* The STI institutional arrangement improves the link between innovation and the productive needs of industry;
* Government should collaborate with the private sector to raise the level of R&D in companies; and
* Public investments in research infrastructure should be focussed on and fulfil the needs of a modern economy.

The 2019-2024 Medium-Term Strategic Framework (MTSF) is framed around seven apex priorities. Although these apex priorities are all interrelated, the Department’s focus and commitments are mainly on Priorities 2 (Economic Transformation and Job Creation) and 3 (Education, Skills and Health). The interventions led by the Department are:

**Priority 2: Economic Transformation and Job Creation**

**Outcome: Improve competitiveness through Information and Communication Technology (ICT) adoption.**

* Intervention: Increase investment in gross expenditure on R&D to 1.1% of GDP by 2024.
* Intervention: Strengthen the NSI by publishing 35 000 research articles by NRF-funded researchers cited in the Web of Science Citation database by 2024.

**Priority 3: Education, Skills and Health**

**Outcome: Expanded access to Post-School Education and Training (PSET) opportunities.**

* Intervention: Increase the number of black lecturers supported through the New Generation of Academics Programme (nGAP) by awarding bursaries to 12 200 PhD students by 2024.

**Outcome: Improved quality of PSET provisioning.**

* Intervention: Implement the nGAP by awarding bursaries to 24 400 pipeline postgraduate (honours and masters) students by 2024.
* Intervention: Increase the number of emerging researcher grants to 3 000 by 2024 to improve the percentage of PhD-qualified staff.

**Outcome: A responsive PSET system**.

* Intervention: Conduct 20 intellectual property (IP) awareness sessions at Technical and Vocational Education and Training (TVET) colleges by 2024.
* Intervention: Support 1.3 million users from the university and post-school sectors, national research facilities, science councils, and all public research-performing institutions through the South African National Research Network (SANReN) by 2024.
	1. **2019 White Paper on Science, Technology and Innovation**

Cabinet approved a new STI White Paper in March 2019. Henceforth, the Department has been keenly focused on formulating and finalising the implementation plan for this White Paper; namely, the 2021-2031 STI Decadal Plan. Although significant strides were made under the former 1996 Science and Technology White Paper, the current STI White Paper and Decadal Plan proposes the vision of a “whole-of-government approach” to innovation to ensure that greater and inclusive well-being and prosperity is derived through STI. To realise the potential contribution of science and innovation to South Africa’s socio-economic ambitions, the STI Decadal Plan sets a number of system goals. These include (i) an inclusive and coherent NSI, (ii) an expanded and transformed research system, (iii) increased and future-proof human capabilities, (iv) an enabling innovation environment, and (v) significantly increased funding for the NSI.

* 1. **Strategic Outcome-Oriented Goals of the Department of Science and Innovation**

The *new era* of STI policy places greater emphasis on technology and innovation deployment, the use of innovation in support of a capable state and service delivery, inclusivity, transformation, partnerships to address policy coherence, the development of human capabilities, knowledge expansion, innovation performance and increased investment. Hence, the Department identified the following six strategic outcomes for the period 2020-2025:

**Outcome 1:** A transformed, inclusive, responsive and coherent NSI;

**Outcome 2:** Human capabilities and skills for the economy and for development;

**Outcome 3:** Increase knowledge generation and innovation output;

**Outcome 4:** Knowledge utilisation for economic development in (a) revitalising existing industries and (b) stimulating R&D-led industrial development;

**Outcome 5:** Knowledge utilisation for inclusive development; and

**Outcome 6:** Innovation in support of a capable and development state.

1. **2021/22 financial performance OF THE DEPARTMENT OF SCIENCE AND INNOVATION**

The President stated in the 2021 State of the Nation Address that the overriding priorities of 2021 were to (i) defeat the coronavirus pandemic, (ii) accelerate economic recovery, (iii) implement economic reforms to create sustainable jobs and drive inclusive growth, and (iv) strengthen the state and fight corruption. The pandemic, more so than other recent crises, has emphasised the importance of science and innovation to both prepare for and react to future crises and has highlighted the need to ensure that STI policies direct RDI efforts toward achieving socio-economic and environmental sustainability, inclusivity and resilience. Hence, the resurgence of thought that advocates that STI should be considered an investment and not merely an expenditure item against the national fiscus.

The 2021 Budget was framed by the policy objectives set out in the 2020 MTBPS, which were to promote economic recovery and return public finances to a sustainable position. Hence, fiscal policy continued to focus on short-term economic support, pro-growth fiscal consolidation and debt stabilisation. The 2021/22 consolidated government allocation for innovation, science and technology was R17.4 billion (R15.4 billion in 2020/21, revised estimate), which was 1% of the total Medium Term Expenditure Framework (MTEF) allocation and 8.4% of the consolidated economic development allocation of R207.5 billion.

* 1. **Vote 35: Science and Innovation 2021/22 Budget Allocation**

The Department’s 2021/22 budget allocation increased from R7.3 billion in the 2020/21 financial year to R8.9 billion. This represented, when adjusted for inflation, a real increase of 17.8% and closely returned the Department’s allocation to what it was in 2020 (R8.8 billion) before the budget cuts to meet the needs of the national COVID-19 response. In terms of economic classification, the apportionment of the Department’s 2021/22 budget allocation of R8.9 billion remained the same as in previous years and comprised Current payments of R566.5 million (6.3%), Transfers and subsidies of R8.4 billion (93.6%), which increased from R6.8 billion in 2020/21, and Payments for capital assets of R2.9 million (0.03%).

The Department’s budget funds five major programmes, namely:

* + Programme 1 – Administration
	+ Programme 2 – Technology Innovation
	+ Programme 3 – International Cooperation and Resources
	+ Programme 4 – Research, Development and Support
	+ Programme 5 – Socio-economic Innovation Partnerships

The percentage budget allocation to the Programmes remained essentially the same as in previous financial years and Programmes 2, 4 and 5 that are responsible for the Transfers to the Department’s entities, received 94.7% of the Department’s total budget allocation.

Notable changes in the allocations to Transfers and subsidies from 2020/21 to 2021/22 included:

* + The allocation for Innovation Projects research increased from R171.4 million to R503.3 million. This allocation supports innovation activities that aim to increase, commercialise and use publicly funded IP.
	+ The allocation for Science awareness and initiatives to encourage youth participation in science increased from R33.5 million to R91.6 million.
	+ The allocation for the Square Kilometre Array’s (SKA) capital contribution to research increased from R456.6 million to R802.4 million. This was for the 20 antennae that will be added to the MeerKAT.
	+ The allocation to the CSIR: Mining R&D increased from R41.7 million to R63.5 million.
	+ The allocation to the CSIR: Cyberinfrastructure R&D increased from R60.2 million to R272.1 million. This was the next tranche of funding to enhance the National Integrated Cyberinfrastructure System, which was allocated R3.6 billion over the medium term.

The 2021 MTBPS stated that the Department had reprioritised funds over the MTEF to support technology localisation, beneficiation, advanced manufacturing and research by the NRF. The 2021/22 Adjusted Estimates of National Expenditure (AENE) showed that the Department’s budget allocation increased by R72.3 million to equal R9 billion. This increase comprised R67 million for Transfers and subsidies, R2.8 million for Current payments and R2.5 million for Payments for capital assets

The R67 million allocated for Transfers and subsidies formed part of the Presidential Youth Employment Intervention. Of this:

* R25 million was to provide training to 450 graduates and 50 community mentors as environmental champions to conduct door‐to‐door community education and awareness campaigns in partnership with the Duzi Umngezi Conversation Trust;
* R32 million was to appoint 900 unemployed graduates through the Water Research Commission’s water graduate employment programme, aimed at improving employment readiness in the water sector; and
* R10 million was to provide training to 250 graduates at the CSIR, to support it in various fields.

The remaining R5.3 million of the R72.3 million increase was allocated for higher salary increases than what the main budget provided for.

Significant virements and shifts were effected to meet South Africa’s obligations for the SKA’s capital contribution to research. These totalled R215.7 million and included:

* From Programme 2: R70 million from TIA and R5.7 million from the Green Nano Chemistry and Nano Medicine Platforms; and
* From Programme 4: R105 million shifted within the NRF and R35 million from the CSIR’s Cyberinfrastructure R&D.

Other significant virements and shifts included:

* R33.9 million shifted from the South African Medical Research Council (SAMRC) to the Network for Genomic Surveillance and mRNA Vaccine Technology Transfer Hub within Programme 2;
* R30.9 million shifted from TIA to SANSA for the Space Weather Centre;
* R20 million shifted within the NRF for human resource development at the Centres of Excellence;
* R25.9 million from the NRF to Programme 5 for Innovation for Inclusive Development; and
* R38.6 million from the CSIR to the Technology Stations Programme.

The 2021/22 AENE stated that the Department’s entities spent more of their ring‐fenced funds in 2021/22 for projects undertaken on behalf of the Department than they did in 2020/21, resulting in fewer surplus funds being surrendered to the Department.

After the AENE process, further virements totalling R62.9 million were effected. In addition, R11.2 million was shifted within Transfers and subsidies. The latter funds were used for:

* A wastewater surveillance system for COVID-19;
* The relocation of the Centre for Proteomic and Genomic Research to the Cape Health Innovation Campus;
* The development of a plant-based bio-surfactant as a pharmaceutical product;
* A vaccine development strategy and the mRNA Vaccine Technology Transfer Hub;
* Capacity development for Historically Disadvantaged Individuals/Institutions (HDIs);
* A K-line imager advanced technology development;
* A sorghum cluster and agroprocessing facility and hub; and
* The Indigenous Knowledge (IK) Registration System.

Additional revenue raised by the Department comprised R1.09 million from surpluses on project funds, commission from Persal transactions, interest received from a deposit account at a commercial bank, payment of bursary debts and other recoverable expenditure. The Department also received R69.8 million in donor funds from the European Union (EU) and spent R59.9 million of these funds.

* 1. **Vote 35: Science and Innovation 2021/22 Budget Expenditure**

The Department spent 99.5% (98.4% in 2020/21), i.e. R8.9 billion of R9 billion (underspending of R43.6 million), of its 2021/22 budget. Table 1 shows the expenditure by Programme and economic classification. The material variance in expenditure per programme was due to Programme 1: Administration and was due to delays in filling prioritised positions. Programme 1: Administration accounted for R23.9 million of the R43.6 million total under-expenditure for 2021/22, with the largest contributor being Compensation of employees at R17.6 million. The material variance in expenditure per economic classification attributed R30.5 million under-expenditure on Compensation of employees across all programmes, R5.7 million under-expenditure on Goods and services and R3.8 million under-expenditure on the Payments for capital assets, which was due to delays in finalising the procurement of laptops and tablets. The under-expenditure on Transfers and subsidies comprised R1.6 million by Programme 4 and R2 million by Programme 5.

**Table 1:** **Department of Science and Innovation’s 2021/22 Expenditure by Programme and Economic Classification**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Programme** | **Final appropriation** | **Actual expenditure** | **Variance** | **Expenditure as a % of final appropriation** |
| **R’000** |
| **1. Administration** | 328 308 | 304 454 | 23 854 | 92.7% |
| **2. Technology Innovation** | 1 725 017 | 1 719 613 | 5 404 | 99.7% |
| **3. International Cooperation and Resources** | 136 276 | 131 808 | 4 468 | 96.7% |
| **4. Research, Development and Support** | 4 995 061 | 4 991 443 | 3 618 | 99.9% |
| **5. Socioeconomic Innovation Partnerships** | 1 820 977 | 1 814 725 | 6 252 | 99.7% |
| **Total** | **9 005 638** | **8 962 043** | **43 595** | **99.5%** |
| **Current payments** | 521 882 | 485 583 | 36 299 | 93% |
| **Transfers and subsidies** | 8 470 925 | 8 467 427 | 3 498 | 99.9% |
| **Payments for capital assets** | 12 731 | 8 941 | 3 790 | 70.2% |
| **Payments for financial assets** | 100 | 92 | 8 | 92% |
| **Total** | **9 005 638** | **8 962 043** | **43 595** | **99.5%** |

Source: 2021/22 Annual Report of the Department of Science and Innovation

* 1. **Auditor-General’s Report on the Financial Statements of the Department of Science and Innovation**

The AGSA awarded the Department an unqualified audit opinion with no findings; hence, a clean audit, for the fourth consecutive financial year. The AGSA stated that no material findings on compliance with key legislation and no significant deficiencies in internal control were identified. In addition, The AGSA stated that, “The relevant role players within the accountability ecosystem (i.e. the minister, accounting officer, audit committee and internal audit unit) provided the necessary assurance, which contributed to the sustained key internal controls, particularly those relating to leadership and governance”.

The Department did not incur any irregular expenditure or fruitless and wasteful expenditure in 2021/22. Irregular expenditure relating to prior years and awaiting condonation by National Treasury amounted to R7.9 million.

1. **2021/22 performance OF THE DEPARTMENT OF SCIENCE AND INNOVATION**

The Department captured its performance into 52 annual performance targets. These were further broken-down into quarterly targets that were reported on when the Committee considered the Department’s quarterly financial and non-financial performance reports.

**Table 2: 2021/22 Quarterly and Annual Programme Performance of the Department of Science and Innovation**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Programme** | **Quarter 1** | **Quarter 2** | **Quarter 3** | **Quarter 4** | **2021/22 Annual****Performance)** |
| **✓** | **🞮** | **✓** | **🞮** | **✓** | **🞮** | **✓** | **🞮** | **✓** | **🞮** |
| **1. Administration** | 2 | 0 | 3 | 1 | 2 | 1 | 4 | 1 | 6 | 0 |
| **2. Technology Innovation** | 3 | 2 | 2 | 0 | 4 | 1 | 11 | 1 | 15 | 0 |
| **3. International Cooperation and Resources** | 6 | 1 | 7 | 1 | 6 | 3 | 4 | 5 | 8 | 1 |
| **4. Research, Development and Support** | 5 | 3 | 8 | 2 | 6 | 2 | 10 | 2 | 11 | 1 |
| **5. Socio-economic Innovation Partnerships** | 6 | 2 | 5 | 2 | 4 | 3 | 6 | 3 | 8 | 2 |
| **Total achieved and not achieved** | **22****(73%)** | **8** | **25****(81%)** | **6** | **22****(69%)** | **10** | **35****(74%)** | **12** | **48****(92%)** | **4** |
| **Total performance targets** | **30** | **31** | **32** | **47** | **52** |

**✓** Achieved

**🞮** Not achieved

For 2021/22, the Department achieved an overall performance of 92% (83% in 2020/21[[1]](#footnote-1) and 87% in 2019/20), achieving 48 of its 52 performance targets (Table 2). During the Committee’s assessment of the Department’s quarterly performance, attention was drawn to the negative trajectory in performance between the second and third quarters. Although the decline was mostly ascribed to factors that were outside the Department’s span of control, the Committee nonetheless cautioned that due attention be given to ensure that the issues do not reoccur.

In relation to overall performance for 2021/22, the four targets that were not achieved are shown in Table 3. Two of the performance targets, namely HDIs capacity building initiatives for international cooperation and pre-approval decisions for the R&D Tax Incentive, were not achieved in the previous financial year as well.

**Table 3: 2021/22 Performance Targets that were Not Achieved**

| **Programme** | **Planned performance target** | **2021/22** |
| --- | --- | --- |
| **Actual achievement** | **Reasons for variance** | **Addressing underperformance** |
| **3. International Cooperation and Resources** | 32 capacity-building initiatives for international cooperation specifically targeting historically disadvantaged institutions and individuals by 31 Mar 2021, and by 31 March 2022. | 24 capacity building initiatives |

|  |
| --- |
| A holistic strategic approach to the inclusion of historically disadvantaged institutions was not emphasised in engagements on international opportunities.  |

 | The Programme has to improve its strategic approach towards the inclusion of historically disadvantages institutions in its engagements on international opportunities. |
| **4. Research, Development and Support** | No fewer than 6 200 pipeline postgraduate students awarded bursaries annually as reflected in the reports from the NRF and other relevant entities by 31 Mar 2022. | 5 643 pipeline postgraduate students were awarded bursaries. | It is difficult to make accurate projections of the number of PhD students versus pipeline (honours and master’s) students to be supported as such numbers are ultimately dependent on the demand, i.e. the number of applications in each category. | A conservative but reasonably fair target has been set for 2022/23, and more attention will be given to the pipeline (honours and master’s) bursary target than to the PhD bursary target, which was exceeded. |
| **5. Socio-economic Innovation Partnerships** |

|  |
| --- |
| 392 high-level research students (of which 57 at PhD level) fully funded or co-funded in designated niche areas (advanced manufacturing, aerospace, chemicals, mining, advanced metals, ICTs, the Industry Innovation Programme (incl. SIFs and green economy) by 31 March 2022 (non-cumulative target). |

 | 287 high-level research students (of which 57 at PhD level) fully funded or co-funded in designated niche areas.  | Significant funds from technology development projects (e.g. the Advanced Metals Initiative and the Advanced Manufacturing Technology Strategy) were allocated to technology diffusion projects (e.g. the Technology Stations Programme and the Technology Localisation Implementation Unit).There were also difficulties in verifying the number of students.  | The planning process for the funding or co-funding of high-level research students in designated niche areas (advanced manufacturing, aerospace, chemicals, mining, advanced metals, ICTs, the Industry Innovation Programme (incl. SIFs and green economy) will be improved with a greater emphasis on the breakdown of the key performance indicator target and of the technical indicator description definitions in the context of experienced validation difficulties. |
| Pre-approval decisions provided within 90 days from the date of receipt for 80% of the applications for the R&D Tax Incentive received between 1 Jan and 31 Dec 2021. | 54% (or 67) of 124 applications for the R&D Tax Incentive were provided with pre-approval decisions. | The quality of information received from applicants is still problematic. A lack of automation and staff shortages has an effect on the monitoring and processing of applications.  | To ensure turnaround times are adhered to, ensure that the R&D Tax Incentive pre-approval application process is automated and ensure that staff shortages are addressed by the better monitoring and processing of applications. |

Source: 2021/22 Annual Report of the Department of Science and Innovation

* 1. **Notable Achievements in 2021/22**
* In relation to efforts to implement the 2019 STI White Paper and finalise the 2021-2031 STI Decadal Plan, the following milestones were achieved:
	+ The first Interministerial Committee (IMC) on STI was held in November 2021 and the Ministers and Directors-General that were in attendance expressed their support for the STI Decadal Plan initiatives, and committed to working together to realise the vision of the STI White Paper.
	+ A number of engagements were held on the STI Public Budget Coordination Mechanism where the support of provincial governments for the principles of the budget coordination mechanism were obtained, and it was agreed that provinces would earmark the procurement of R&D by their own entities (rather than by consultants) as focus items for STI spending going forward.
* The Department has been supporting the development of domestic rocket engine technologies since 2010. The Aerospace Systems Research Group at the University of KwaZulu-Natal spearheaded the development of rocket engine technologies in both liquid and solid rockets. The Ablative Blow-down Liquid Engine (ABLE) was successfully tested in November 2021 at the Denel Overberg Test Range in the Western Cape. The powerful liquid-propellant rocket engine is the first step towards locally developing a launch vehicle for placing satellites into orbit. Furthermore, ABLE is one of the most powerful student-built liquid rocket engines ever produced.
* Through The Grassroots Innovation Programme (GIP) and the Technology Acquisition and Deployment Fund (TADF), the Department facilitated access to multi-tiered support packages (including technology development, IP protection, mentorship, etc.) for over 100 beneficiaries. This support for the commercialisation of locally developed technologies and innovations by youth, women and people with disabilities, benefited unemployed graduates emerging as entrepreneurs. The GIP launched 10 innovation products on the market. The programme will now expand its offering to include GIP Robotics, GIP Enterprise and GIP Exchange, which will facilitate technology exchange between South African grassroots entrepreneurs and their Indian counterparts.
* A notable achievement in the year under review was the critical role played by the Department in positioning South Africa as the host for the mRNA Vaccine Technology Transfer Hub, an initiative of the World Health Organization in partnership with the South African and French governments and the Medicines Patent Pool. The aim of the Hub is to diversify vaccine manufacturing and, specifically, to accelerate vaccine production in Africa, through a consortium made up of the Medicines Patent Pool, Biovac, Afrigen Biologics and Vaccines, the Department, the SAMRC, a network of universities and the Africa Centres for Disease Control and Prevention. The main objective is to establish a training facility where mRNA vaccine technology is developed to the scale required for the mass production of vaccines, and for the full package of technology developed to be transferrable to multiple recipients in low and middle-income countries.
* To strengthen the use of IK for innovation, the Department and North-West University launched the IK Registration System in March 2022.
	1. **Auditor-General’s Test of the Performance Information of the Department of Science and Innovation**

The AGSA does not express an opinion or conclusion on the reported performance information. Neither does the AGSA evaluate the completeness and appropriateness of the performance indicators. However, the AGSA does test the usefulness and reliability of the reported performance information for selected Programmes. In this case, Programme 2: Technology Innovation was selected. During the audit process, the AGSA identified material misstatements in the annual performance report of Programme 2: Technology Innovation. However, since the Department’s management corrected these misstatements, the AGSA did not raise any material findings on the usefulness and reliability of the reported information for this Programme.

1. **ENTITIES OF THE DEPARTMENT OF SCIENCE AND INNOVATION**

The Department’s entities are funded through an annual baseline allocation also known as the parliamentary grant; specific project and/or contract funds; or from income that is generated from research and commissioned projects; or from income that is generated from royalty, publishing, membership, registration and/or facility fees.

For the current reporting period, the Committee considered the 2021/22 Annual Reports of the CSIR, HSRC, NRF, SANSA and TIA.

**Table 4: 2021/22 Departmental transfers and performance summary of the entities of the Department of Science and Innovation**

| **Entity** | **Departmental transfer****R’000** | **Performance** | **Audit outcome** |
| --- | --- | --- | --- |
| **2020/21** | **2021/22** | **2020/21** | **2021/22** | **2020/21** | **2021/22** |
| Council for Scientific and Industrial Research | 893 581 | 978 449 | 80% | 81% | Unqualified with no findings | Unqualified with no findings |
| Human Sciences Research Council | 289 325 | 314 391 | 90% | 90% | Unqualified with findings | Qualified with findings |
| National Research Foundation | 859 469 | 962 587 | 78% | 72% | Unqualified with no findings | Unqualified with no findings |
| South African National Space Agency | 161 196 | 202 193 | 82% | 94% | Unqualified with findings | Unqualified with no findings |
| Technology Innovation Agency | 408 825 | 447 703 | 90% | 86% | Unqualified with no findings | Unqualified with no findings |
| **Total** | **2 637 236** | **2 938 536** | **Average (84%)** | **Average (85%)** | **3 of the 5 obtained clean audits** | **4 of the 5 obtained clean audits and 1 regressed** |

* 1. **COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH**

The CSIR’s mandate is to foster, through directed and multidisciplinary research and technological innovation, industrial and scientific development. As such, the CSIR researches, develops, localises and diffuses technologies to accelerate socio-economic prosperity in South Africa.

The CSIR’s current strategy, named Project Synapse, responds to global and local socio-economic and technological megatrends and South Africa’s challenges and opportunities. Project Synapse defines technology sector clusters that seek to balance scientific and industrial development by intensifying industrial development in priority, high-impact economic sectors through RDI. Project Synapse defines priority industries as those industries that:

* Present the greatest potential for socio-economic impact according to a robust set of economic and social criteria that are both forward looking and reflective of the current status; and
* Dependent on R&D, are amenable to stimulation through innovation, and thus offer opportunities for the CSIR to pursue.

In line with the intent of Project Synapse, the CSIR value proposition includes:

* Technology licensing and start-up creation;
* Access to specialised, state of the art infrastructure, skills and technology incubation;
* Innovation support;
* Improvement of industry competitiveness;
* New industry creation;
* Technology localisation and supplier development; and
* Community-based industry creation.
	+ 1. **2021/22 Revenue**

The CSIR’s total revenue was R2.65 billion (R2.57 billion in 2020/21 and R2.76 billion in 2019/20), which was 8% less than the target set. The net profit of R137 million exceeded the budget estimate by R233 million since the CSIR projected that it would suffer a R96 million loss in 2021/22. Contract revenue was R1.92 billion (R1.91 billion in 2020/21) and the parliamentary grant was R730.3 million (R670 million in 2020/21). Royalty revenue was R7.4 million (R2.6 million in 2020/21).

The largest portion of the CSIR’s revenue, at 56%, was contract R&D from the public sector, followed by the parliamentary grant at 27%. Private sector and international contract revenues were 9% (13% in 2020/21) and 8% (5% in 2020/21) respectively. The CSIR improved its B-BBEE rating level, moving from level 2 to level 1, which is currently the best among public sector entities.

The CSIR identified the following factors, which constrained its ability to earn revenue:

* Reduction in contract R&D revenue because of continuing adverse economic conditions due to the ongoing COVID-19 pandemic, resulting in parts of the business not being fully operational, for example, the CSIR International Convention Centre.
* Reduced level of productivity due to the ongoing COVID-19 pandemic earlier in the financial year.
* Key contracts with the public sector were not secured, for example, contracts with Armscor/Department of Defence and Department of Correctional Services in the Defence and Security cluster. Delays in securing large-value contracts, such as a contract for the Titanium Centre of Competence and the National Foundry Technology Network.
* Lease agreements with proposed tenants for vacant space were not secured as planned due to working from home arrangements because of the COVID-19 pandemic, which diminished the need for office space.
* Delays in the acquisition of equipment funded by public sector funding (this also resulted in lower than planned depreciation expenses).
* The electricity crisis affected wind tunnel testing and the ability to earn revenue from this facility during periods of constrained energy supply.
* Moreover, National Treasury Regulations make it increasingly difficult for public entities to contract directly with government and state-owned enterprises for mandated work. Public institutions require the CSIR to compete for R&D activities in open tenders, which, as a public entity mandated to perform this type of work, should not be the case. This practice leads to the loss of revenue opportunities of approximately R450 million, every year.
	+ 1. **2021/22 Performance**

Overall, the CSIR achieved or exceeded 25 of the 31 (81%) key performance indicators (KPIs) for the 2021/22 financial year (80% in 2020/21). Compared to the previous financial year, selected performance highlights included:

* A 40% increase in priority patent applications;
* A 15% increase in the number of technology demonstrators;
* A 300% increase in the number of technology licence agreements;
* A 180% increase in the number of localised technologies;
* A 3% increase in the number of small, medium and micro enterprises (SMMEs) supported;
* The number of projects that contributed to increasing the capability of the state increased by 95%;
* The science, engineering and technology (SET) base increased by 5.2%;
* The number of exchange programmes with industry increased by 287.5%, in line with the intention to work more closely with industry.

In relation to its five Strategic Outcomes (SO), the CSIR recorded the following achievement:

**SO1: Conduct RDI of transformative technologies and accelerate their diffusion**

The CSIR achieved three of the five performance indicators. As in 2020/21, the CSIR did not achieve the target for the number of technology licence agreements signed (12 instead of 19). This was due to delays in negotiating new licence agreements between the CSIR and its partners. The target for new priority patent applications filed (seven instead of nine) was also not met due to pipeline issues.

**SO2: Collaboratively improve the competitiveness of high-impact industries to support South Africa’s re-industrialisation**

The CSIR exceeded all three performance indicators, demonstrating its commitment to support re-industrialisation through technology support.

**SO3: Drive socio-economic transformation through RDI that supports the development of a capable state**

The CSIR met all three performance indicators that contribute to the support of a capable state.

**SO4: Build and transform human capital and infrastructure**

SO4 comprised 12 performance indicators, of which five were exceeded, four were achieved and three were not achieved. The targets that were not achieved included the percentage of SET staff who hold a PhD degree, the total number of chief researchers and the percentage of chief researchers who are female. To mitigate against these matters, the CSIR undertook to increase recruitment efforts and implement a career ladder process to curb the regression.

**SO5: Diversify income and maintain financial sustainability and good governance**

SO5 comprised eight performance indicators, of which four were exceeded, three were achieved and one was not achieved. The target for total income realised was not achieved, falling 8% short of the target set.

The CSIR identified the following areas of improvement:

* The CSIR needs to ensure that it has a strong pipeline of priority patent applications to support the growth in patents granted. More importantly, the CSIR must monetise this IP through licensing and other means of commercialisation.
* The growth and transformation of the principal and chief researcher pools remain a challenge and despite implementing various initiatives, progress is slow. As such, the CSIR created a strategic fund to attract chief and principal researchers to the organisation.
* In its efforts to diversify its income streams, the CSIR is seeing improvement in its private sector contract R&D; however, the pace of growth remains slow. The constrained economic environment is a major contributing factor to this performance.
	+ 1. **2021/22 Audit Outcome**

The AGSA selected SO1 – Conduct RDI of transformative technologies and accelerate their diffusion, to test the usefulness and reliability of the reported performance information. The AGSA did not raise any material findings on the usefulness and reliability of the reported information for this strategic outcome.

The AGSA awarded the CSIR an unqualified audit opinion with no findings; hence, a clean audit, for the fourteenth consecutive financial year. The AGSA stated that no material findings on compliance with key legislation and no significant deficiencies in internal control were identified. In addition, the AGSA stated that, “The relevant role players within the accountability ecosystem provided the necessary assurance, which contributed to the sustained key internal controls, particularly those relating to leadership and governance”. Furthermore, the AGSA stated that, “Management and the accounting authority enforced preventative controls and consequence management, which resulted in sustainable audit outcomes”.

The CSIR incurred irregular expenditure of R3.7 million due to nine incidences of non-compliance with supply chain management regulations, three of which were committed prior to 2021/22. At the time of reporting, management was effecting consequence management against the officials who committed the offences. In all instances, no loss was suffered by the CSIR. The CSIR incurred R17 000 in fruitless and wasteful expenditure due to legal costs incurred from the late payment of a supplier.

* 1. **HUMAN SCIENCES RESEARCH COUNCIL**

The HSRC is mandated to:

1. Initiate, undertake and foster strategic basic and applied research in human sciences. Address developmental challenges in the Republic, elsewhere in Africa and in the rest of the world.
2. Inform the effective formulation and monitoring of policy, as well as evaluate the implementation thereof.
3. Stimulate public debate through the effective dissemination of fact-based research results.
4. Help build research capacity and infrastructure for the human sciences.
5. Foster research collaboration, networks and institutional linkages.
6. Respond to the needs of vulnerable and marginalised groups in society through research and analysis of developmental issues.
7. Develop and make available data sets underpinning research, policy development and public discussion of developmental issues.
8. Develop new and improved methodologies for use in the development of such data sets.

The HSRC continued its focus on poverty and inequality over the current five-year strategic plan period. Through its vision of being a national, regional and global leader in the production and dissemination of transformative social science and humanities research in the interests of a just and equal society, the HSRC carried out research-based services to inform government planning, policy and development. It provided advice and analysis to government and stakeholders on various issues, drawing from a humanities and social sciences perspective.

A new HSRC Board, comprising 11 members and under the leadership of Dr Cassius Lubisi, took office on 1 November 2021. In his foreword to the 2021/22 Annual Report, Dr Lubisi stated that on assuming office, three priorities demanded the Board’s immediate attention. These were:

* The previous Board could not fill the position of Chief Executive Officer (CEO), which has been vacant since April 2021. The new Board commenced with a renewed recruitment process and it is expected that the CEO position will be filled in the current financial year.
* HSRC staff had endured significant emotional and financial hardship for the past three years, as cost-of-living adjustments or performance-based increases were disallowed for several years. Following extensive consultation with the Executive Authority, National Treasury and independent senior counsel, the new Board was able to implement modest cost-of-living adjustments to bring much needed relief and an improvement in staff morale.
* It emerged in 2020 that a deviation from the prevailing tax legislation occurred during a payroll system transition in 2016. Because of a human and system programming error, the requisite tax on unapproved risk policies attached to the HSRC Pension Fund was not paid to SARS. This anomaly was identified by management and when reported to the Board in August 2020, was corrected immediately. A process for calculating the outstanding liability was concluded and a process of applying for Voluntary Disclosure Relief from SARS is underway.
	+ 1. **2021/22 Revenue**

The current financial model of the HSRC depends significantly on external funding to support research and the broader mandate of the HSRC. There is continued pressure on the HSRC to increase external income earnings at a faster pace than the growth in its parliamentary grant, to ensure that all necessary budget commitments in terms of staff, administration, infrastructure and research can be met. Hence, the HSRC’s view that, “The declining Parliamentary Grant continues to constrain, rather than facilitate the HSRC’s mandate”. In mitigation, the HSRC will review its funding strategies and explore opportunities to unlock funding as part of its shift in focus from research generation to research use.

Total revenue for 2021/22 was R588.9 million with the parliamentary grant constituting R273.4 million (46%) of the total revenue. Research revenue was R280.1 million and other operating revenue was R35.5 million.

Programme 1: Administration was allocated R242.9 million (42%) of the total budget and spent R180.9 million, where salaries constituted R101.5 million (R27 million less than planned) of the expenditure. Programme 2: Research, Development and Innovation was allocated R339.2 million (58%) of the total budget and spent R362.4 million, overspending by R23.3 million because of increased research activities undertaken. The HSRC reported a surplus of R45 million at the end of the 2021/22 financial year. The surplus was primarily due to a significant decrease in the administration and operating costs of the HSRC. The completion of project activities and milestones on several large-scale projects enabled the HSRC to exceed its external income target by 22%. Hence, research costs and depreciation expenses were above the budgeted amounts because of increased research activities during the financial year.

* + 1. **2021/22 Performance**

The HSRC pursues its research agenda within five strategic outcomes, summarised in the acronym “LeaPPT+S”. This stands for **Lea**dership in knowledge production, **P**olicy influence, **P**artnerships, **T**ransformed research capabilities and **S**ustainability.

The HSRC’s five strategic outcomes are implemented across two programmes; namely, Programme 1: Administration and Programme 2: Research, Development and Innovation.

**Programme 1: Administration**

The Administration Programme is responsible for the strategic direction and overall management of the HSRC. An Impact Centre was established in 2020 to focus on enhancing the use and impact of the HSRC’s research.

Programme 1 achieved 10 of its 11 performance indicators. The target on the percentage of researchers with PhDs (planned for 76% and attained 69%) was not met during the reporting period. The variance in achievement was attributed to staff-turnover and project-specific recruitment of lower-level research staff. Furthermore, the HSRC faces the challenge of a limited number of senior researchers who are required not only to raise funds, but also to implement a range of contract research projects, and reach scholarship targets. As was highlighted in all previous institutional reviews, the HSRC needs to employ more senior researchers on permanent conditions of service to ease the burden of fund raising, and to provide reliable mentoring to its research trainees. However, filling the vacancies for senior research staff has been constrained by salary caps implemented by National Treasury and further reductions in the allocation for the Compensation of employees. The HSRC competes with the market for these in-demand, high-level skills and cannot offer market-related competitive salaries or, until February 2022, permanent positions.

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

This programme conducts basic and applied research, generating and applying knowledge that addresses and provides deeper insights into some of the challenges that society is grappling with. Programme 2 includes the Africa Institute of South Africa (AISA), the Centre for Community-based Research in Sweetwaters, Pietermaritzburg and the Centre for Science, Technology and Innovation Indicators (CeSTII).

Programme 2 achieved nine of its 10 performance indicators. The target of 47 book chapters published (actual achievement 40 book chapters) was not met. One of the contributing factors is that the book publication process is lengthy and is dependent on many factors, most of which are beyond the control of the HSRC.

Overall, in 2021/22, the HSRC maintained its previous performance and achieved 19 of its 21 (90%) performance indicators.

* + 1. **2021/22 Audit Outcome**

The AGSA selected Programme 2: Research, Development and Innovation, to test the usefulness and reliability of the reported performance information. The AG did not raise any material findings on the usefulness and reliability of the reported information for this Programme.

The AGSA awarded the HSRC a qualified audit opinion with findings, a regression from last year’s unqualified audit opinion with findings. The basis for the qualified audit opinion stemmed from the HSRC not accurately recording leave accrual in the financial statements. Consequently, leave accrual was understated by R11.3 million. The matter arose because the HSRC did not implement manual reconciliation processes to confirm that its systems produced information that was valid, accurate and complete. Furthermore, the AGSA identified weaknesses relating to the design and/or implementation of controls in the focus areas of security management, user access management, physical and environmental controls, and IT service continuity, which could have a direct impact on the entity’s business operations.

The AGSA recorded findings in relation to non-compliance with selected legislative prescripts where the HSRC submitted financial statements that were not prepared in accordance with the prescribed financial reporting framework and supported by full and proper records. Furthermore, in relation to procurement and contract management, some of the invitations for competitive bidding were not advertised for the required minimum period, and there was no evidence that bid documentation and invitations to tender for procurement of commodities designated for local content and production stipulated the minimum threshold for local production and content. Finally, the AGSA could not obtain sufficient and appropriate audit evidence that disciplinary steps were taken against officials who had incurred irregular expenditure because investigations into irregular expenditure were not performed. These instances also led the AGSA to a finding that there were deficiencies in internal control.

The HSRC incurred irregular expenditure of R792 000 in the current financial year and R19.6 million identified in the current financial year but incurred during 2020/21. The HSRC incurred R15.9 million irregular expenditure in 2020/21.

The HSRC incurred fruitless and wasteful expenditure of R14 000 (R27 000 in 2020/21 for the same reasons provided) due to staff members missing flights and incurring traffic fines. These monies will be recovered from staff.

* 1. **NATIONAL RESEARCH FOUNDATION**

The objective of the NRF is to contribute to national development by:

1. Supporting, promoting and advancing research and human capacity development, through funding and the provision of the necessary research infrastructure, to facilitate the creation of knowledge, innovation and development in all fields of science and technology, including the humanities, social sciences and IK;
2. Developing, supporting and maintaining national research facilities;
3. Supporting and promoting public awareness of, and engagement with, science; and
4. Promoting the development and maintenance of the national science system.

The strategic outcomes of the NRF are:

**Outcome 1:** A transformed, internationally competitive and sustainable research workforce;

**Outcome 2:** Enhanced impact of the research enterprise;

**Outcome 3:** Enhanced impact of Science Engagement; and

**Outcome 4:** A transformed organisation that lives its culture and values.

* + 1. **2021/22 Revenue**

The NRF mainly derived its income from the parliamentary grant (R962.6 million), Departmental contracts (R3 billion), other contract income (R350 million), sales revenue (R94.8 million) and interest received (R40 million). The NRF’s total income increased by 25% from R3.6 billion in 2020/21 to R4.5 billion in 2021/22, but was still approximately R464 million less than originally budgeted. The overall decline of the NRF’s budget continued, which translated to lower than needed investment, which in turn translated to slower impact.

The NRF’s total expenditure increased by 24% from R3.6 billion in 2020/21 to R4.2 billion in 2021/22 and was mainly attributed to a significant recovery in operational activity as COVID-19 restrictions eased and normality returned. The NRF reported an accumulated surplus of R7.3 million.

Grants, bursaries and other research expenditure increased by 14% from R2.1 billion to R2.4 billion and were attributed to the National Equipment Programme as this funding is received every alternate year. Programme and operating expenditure was R973 million and expenditure on staff salaries and wages was R717 million. The increase in operating expenditure was due to the return to a stable level of operations, while the payment of South Africa’s membership contribution to the SKA Observatory (SKAO) increased expenditure by R275 million.

Capital expenditure increased by R291 million as spending aligned to delivery on the South African Isotope Facility (SAIF) 70 MeV cyclotron and the MeerKAT extension project ramped up.

To ensure operational and financial sustainability, the NRF contained it overheads expenditure below the 10% threshold, decreasing from 9.5% in 2020/21 to 7.9% in 2021/22.

* + 1. **2021/22 Performance**

The NRF is organised into four programmes, which together record progress against the NRF’s strategic outcomes. The programmes are:

**Programme 1: Corporate** – provides enabling systems and structures that support effective and efficient governance, strategy and planning capacity, and shared services.

**Programme 2: Science Engagement** - leads and coordinates the discourse on science with and for society and supports the national imperative of developing a scientifically literate society.

**Programme 3: Research and Innovation Support and Advancement (RISA)** - supports and promotes research through the development of human capacity, the generation of knowledge, and the provision of, and access to, cutting-edge research infrastructure.

**Programme 4: National Research Infrastructure Platforms (NRIP)** - provides leading-edge research infrastructure platforms in support of knowledge generation, innovation and human capacity development.

These Programmes contribute to the NRF’s four strategic outcomes against which performance is measured. Overall, the NRF achieved or exceeded 13 of its 18 (72%) performance indicators. The targets that were not achieved are:

**Programme 2: Science Engagement**

The target for the number of scientists/journalists that used indigenous languages in science communication was 320. The actual achievement was 156. This is a new area of focus for the NRF; hence, this is designated as a stretch target where performance gradually improves.

**Programme 3: Research and Innovation Support and Advancement**

The target for the number of NRF-funded researchers was 4 521. The actual achievement was 3 201 due to lower demand for a number of funding instruments.

The target for the number of peer-reviewed publications produced by NRF-funded researchers was 9 250. The actual achievement was 9 116 due to researchers undertaking fewer field trips and attending fewer international conferences and workshops due to the COVID-19 restrictions; hence fewer papers were produced.

**Programme 4: National Research Infrastructure Platforms**

The target for the proportion of South African researchers from designated groups who use the National Facilities (NFs) was 39%. The actual achievement was 11% due to the NFs systems not being designed to collect this data from users.

The target for the number of Southern African Large Telescope (SALT) Gen1.5 subprojects being implemented was four. The actual achievement was three due to the SALT Board suspending one project.

The underachievement against these targets will be mitigated as follows:

**Programme 2: Science Engagement** – KPIs for the next reporting cycle were reviewed in consultation with the Department to measure output that is within the control of the NRF.

**Programme 3: Research and Innovation Support and Advancement** - targets for funded researchers will be adjusted in line with the available budget and baseline performance over the past three financial years. The peer-reviewed publications’ KPI, although a significant measure of performance for the NRF, is not within its direct control. Hence, the output was removed from the 2022/23 Annual Performance Plan. Publications will; however, still be tracked by the NRF as an outcome of the NRF’s investment into the NSI.

**Programme 4: National Research Infrastructure Platforms** - The NRF has adopted a POPIA Policy that will guide the NFs on the lawful collection and processing of personal information of users of the Research Infrastructure Platforms.

Notable progress was achieved against specific strategic measures. These included:

* + Successful implementation of the DSI-NRF Postgraduate Student Funding Policy.
	+ The Engaged Research Framework was adopted in March 2022. The Framework provides for an ongoing process of embedding Science Engagement more holistically within NRF programmes and enabling engaged scholarship.
	+ The Leading Researchers and Scholars Programme (LRSP) was developed in consultation with the Department and the first call for applications was expected during 2022/23.
	+ The NRF developed the Framework to Advance the Societal and Knowledge Impact of Research and the consolidated NRF Impact Implementation Plan was completed at the end of 2021/22, for execution in 2022/23.
	+ The overall implementation progress for the SAIF at iThemba LABS reached 75%.
		1. **2021/22 Audit Outcome**

The AGSA selected Programme 3 – Research and Innovation Support and Advancement, to test the usefulness and reliability of the reported performance information. The AGSA did not raise any material findings on the usefulness and reliability of the reported information for this Programme.

The AGSA awarded the NRF an unqualified audit opinion with no findings; hence, a clean audit, for the third consecutive financial year. The AGSA further stated that no material findings on compliance with key legislation and no significant deficiencies in internal control were identified. In addition, the AGSA stated that, “The relevant role players within the accountability ecosystem provided the necessary assurance, which contributed to the sustained key internal controls, particularly those relating to leadership and governance”.

The NRF did not incur any irregular expenditure or fruitless and wasteful expenditure in 2021/22. On 26 July 2022, the NRF Board approved that irregular expenditure of R12.9 million relating to 2020/21 be removed from the Annual Financial Statements.

* 1. **SOUTH AFRICAN NATIONAL SPACE AGENCY**

The legislative mandate of SANSA is premised on two primary Acts; namely, the Space Affairs Act (No. 84 of 1993) and the South African National Space Agency Act (No. 36 of 2008). The former, an instrument of the Department of Trade, Industry and Competition, caters for the regulatory/policy context for the South African space programme; whereas the latter, an instrument of the Department, enables the establishment of SANSA as an implementing agency for the South African space programme. The National Space Strategy and the South African Earth Observation Systems (SAEOS) Strategy provide edicts that directly inform the operationalisation of the South African space programme, inclusive of the role that SANSA should play.

During the first eight years of SANSA’s operations, its Strategic and Annual Performance Plans were aligned to the budgetary allocations for both its internal business operations and broader support to the local space sector. This approach imposed limitations on SANSA’s planned and implemented scope of initiatives. With its revised 2020-2025 Strategic Plan, SANSA seeks to ensure that the South African space sector is able to develop and compete globally, and that it responds to the critical needs of its user community, primarily represented by all spheres of government.

* + 1. **2021/22 Revenue**

SANSA’s total revenue was R332.8 million, with Transfers and grants constituting R249.8 million and the parliamentary grant of R181.3 million constituting 54.5% of total revenue. Contract revenue was R83 million, which was R11.7 million more than was budgeted. This increase was mainly attributed to additional foreign revenue earned through Space Operations from Intelsat (multinational satellite services provider) and Paneos (antenna for the detection and monitoring of space debris). Total expenditure was R347 million and personnel expenditure accounted for 44% of total expenditure due to the high-level, scarce skills needed by SANSA.

SANSA identified several key infrastructure projects with an estimated value of R4.54 billion. The major infrastructure project is the development of the Space Infrastructure Hub for which the feasibility study was concluded in this financial year. SANSA is also constructing a regional 24-hour Space Weather Operational Centre, which was 70% completed at the end of the financial period under review.

* + 1. **2021/22 Performance**

SANSA has five programmes; namely, Administration, Earth Observation, Space Operations, Space Science and Space Engineering. These Programmes contribute to the following six strategic outcomes against which performance was measured:

**Outcome 1:** Increased space relevant knowledge that supports the developmental agenda;

**Outcome 2:** Growth of the space sector through SANSA space related industry expenditure;

**Outcome 3:** Increased human capacity for the implementation of key space initiatives;

**Outcome 4:** SANSA positioned as a key enabler of government’s space related policies;

**Outcome 5:** Appropriate infrastructure developed to support the local space sector; and

**Outcome 6:** Increased share of the global space operations market.

SANSA achieved an overall performance of 94% for the 2021/22 financial year (82% in 2020/21).

**Programme 1: Administration** – Many initiatives were undertaken in relation to new business development, stakeholder engagement and communication. However, neither the Skills Audit nor Workforce Plan, which were the measurable performance targets, was concluded. This was due to the Skills Audit project only being launched in January 2022, with the Workforce Plan being a deliverable of this project.

**Programme 2: Earth Observation** – Met all 12 measurable performance targets.

**Programme 3: Space Science** – Met all nine measurable performance targets.

**Programme 4: Space Operations –** Met all three measurable performance targets.

**Programme 5: Space Engineering –** Met three of the seven measurable performance targets. The targets that were not met are:

* The percentage (20%) contract expenditure to small and medium enterprises (SMEs), and contract expenditure to broad space industry (R10 million) due to the ongoing negotiations around the transfer of the Houwteq Assembly Integration and Testing (AIT) facility from Denel to SANSA. The expenditure would have been towards the upgrade of the facility.
* The targets (one each) set for activities initiated through African and National partnerships. Work on these initiatives is still pending.

Selected performance highlights included:

* + - * SANSA was appointed as the host of the Digital Earth Africa Programme Management Office to amplify the value of Earth Observations for the continent.
			* SANSA has expertise in the entire space value chain from research, to development, to application and its research can be placed in the top 10% of research output when compared to South African universities.
			* The SANSA Hermanus Facility achieved ISO 9001:2015 certification for its products and services, which was one of the requirements of the International Civil Aviation Organisation upon designating SANSA as a regional Space Weather Centre for the aviation industry.
			* SANSA engaged 22 224 youth through its space awareness initiatives.
			* SANSA supported 86 students and interns versus the targeted 50.

SANSA stated that the risks to its operations and performance were characterised by the following:

**Completion of the EO-Sat1 satellite build programme**

A proposal describing the EO-Sat1 contracting history, current stakeholder environment and two options on how to proceed was submitted and accepted by the SANSA Board for submission to the Department’s Director General (DG). In parallel to the proposal, SANSA’s Board supported the consolidation and closeout of all lapsed, existing related contracts with Denel Spaceteq, the main build contractor, to establish a clean contractual baseline for the future. The project was placed on hold in the 2018/19 financial year pending the sourcing of additional funding to complete the project.

**Transfer the ownership of the Houwteq facility from Denel to SANSA**

The prolonged delay relating to the transfer of the Houwteq facility from Denel to SANSA has negatively affected the establishment of an Assembly, Integration and Testing (AIT) facility to ensure the provision of relevant support to industry. There are still risks associated with shifts in the industry’s current usage of Houwteq and industry requirements will need to be monitored closely; especially since Denel’s call to mothball the facility.

**Suboptimal funding levels**

The allocated budget for SANSA remains suboptimal and it needs to seek additional funding to be able to fulfil its mandate. Some of these funding commitments include investor funding, which require SANSA to be able to borrow. This has implications for SANSA’s future operating model and its’ functioning as a Schedule 3A entity.

**Protection of SANSA sites**

SANSA is experiencing interference relating to its operational activities, both from radio frequency interference (RFI) and magnetic interference. Interventions in this regard include declaring some of the sites as National Key Points and instituting regulatory reforms to protect these sites.

* + 1. **2021/22 Audit Outcome**

The independent auditor, Nexia SAB&T, does not express an opinion or conclusion on the reported performance information. Neither does the auditor evaluate the completeness and appropriateness of the performance indicators. However, the auditor does test the usefulness and reliability of the reported performance information for selected Outcomes. In this case, Outcome 4: SANSA positioned as a key enabler of government’s space related policies, was selected. The auditor did not raise any material findings on the usefulness and reliability of the reported information for this Outcome.

SANSA has resolved all matters that resulted in audit findings in the previous two years. Hence, the independent auditor awarded SANSA an unqualified audit opinion with no findings, a clean audit. The auditor further stated that no material findings on compliance with key legislation and no significant deficiencies in internal control were identified.

SANSA incurred irregular expenditure of R1.7 million because a supplier omitted to complete its declaration of interest. SANSA did not suffer financial loss, and there was no fruitless and wasteful expenditure noted on this transaction as all goods and services were required by SANSA.

* 1. **TECHNOLOGY INNOVATION AGENCY**

It is the mandate of TIA to translate a greater proportion of publicly funded research into commercial technology products and services. This implies exploiting the existing body of knowledge at universities and public research organisations, and channelling it towards the development of technology-based industries. This is done with the intention of creating sustainable jobs and transforming the economy from one that is reliant on commodity exports to one that is knowledge-based and equipped to address modern local and global challenges.

A critical review of TIA’s execution of its core mandate revealed that TIA has supported a large number of innovations. However, the translation and commercialisation success rate has been suboptimal. Hence, TIA aims to reposition itself strategically within the NSI by directing a greater proportion of its resources towards the translation and commercialisation of publicly financed IP emanating from higher education institutions and science councils. Consequently, TIA’s 2021/22 Annual Report shows that the proportion of its budget allocated to publicly funded beneficiaries increased from 57% to 75% (amounting to R280.9 million).

The 2020-2025 strategic focus of TIA hinges on three core pillars/outcomes:

**Outcome 1: Commercialising innovations** – TIA has a significant portfolio of de-risked, early-stage technologies for investors to commercialise.

**Outcome 2: Delivering on the Bio-economy Strategy** by targeting the Health, IK, Agriculture and Industrial Biotechnology sectors.

**Outcome 3: Increasing the participation of entrepreneurs and innovators, and supporting SMMEs in technological innovation** - Providing access to key infrastructure capabilities such as the Technology Stations and other innovation-enabling interventions.

* + 1. **2021/22 Revenue**

Total revenue was R633.9 million, with the parliamentary grant constituting R447.7 million of the total revenue. Total expenditure for the year was R611.3 million, which was R39.1 million higher than budgeted for. This was due to higher than projected investment expenditure of R52.2 million offset by savings in operational expenditure. Total disbursements amounted to R458.9 million, representing a 9.4% increase on 2020/21. These comprised R86 million for commercialising innovations, R221.5 million for the Bio-economy Strategy and R151.3 million for innovation enabling initiatives. For the third consecutive financial year, TIA dispersed more than 90% of its MTEF allocation. TIA realised an actual surplus of R22.6 million, which was largely attributed to a combination of greater income generated, lower than anticipated investment expenditure and savings on operational expenditure.

The 2021/22 financial year represented the first phase of the 3-year pilot of the Innovation Fund, a R150 million instrument of the Department aimed at enhancing and accelerating the rate of commercialisation of locally developed technologies. TIA is one of the implementing partners along with the SA SME Fund, the Public Investment Corporation and the Industrial Development Corporation. TIA received R80 million, with 87.5% of this successfully committed to approved projects and R25.2 million disbursed to project recipients. Under this fund, TIA concluded agreements with nine projects under the Bio-economy portfolio by the end of 2021/22. These included six IK-related projects with a total value of R40.5 million under the Natural Indigenous Products Programme (NIPP) Fund. The NIPP fund was established to advance the development and commercialisation of IK. A total of R31.4 million was disbursed to projects in 2021/22. For the Commercialisation portfolio, TIA concluded agreements with five projects (Pelebox, Riot and Lepsta in the ICT portfolio and Settlebed detector and Smartsensor in the Natural Resources portfolio) totalling R21.5 million, with R15.9 million disbursed in 2021/22. In addition, a further R10.5 million was disbursed to the University Technology Fund. TIA has been entrusted with a further R102.2 million to implement phase two of the Innovation Fund.

* + 1. **2021/22 Performance**

For 2021/22, TIA achieved 19 of its 22 annual performance indicators, which equates to an overall performance of 86% (90% in 2020/21). Of the 22 annual output indicators, nine related to support services and 13 to delivering on TIA’s core mandate. The three targets that were not achieved and the one partially achieved target are shown in Table 5.

**Table 5: 2021/22 Performance indicators that were not achieved by TIA**

| **Output indicator** | **Planned target** | **Actual Achievement** | **Reason for variance** |
| --- | --- | --- | --- |
| **Outcome 2: Delivering on the Bio-economy Strategy** |
| Number of existing Technology Innovation Clusters that are operational and functional. | 8 | 7 | TIA did not achieve this target due to not concluding funding agreements and associated business plans and funding proposals with the Dairy Genomics Programme and the Beef Genomics Programme. In the former instance, the industry association declined to commit to transformation targets. In the latter instance, several matters remained unresolved despite several engagements with the respective science council. |
| **Outcome 3: SMMEs supported through strategically informed and regionally distributed Technology Stations** |
| Number of SMMEs and cooperatives receiving SET support. | 3 500 | 3 167 | **Partially achieved.**TIA’s annual performance is 90% of the annual target of 3 500, which is deemed acceptable according to the technical indicator description for this output indicator per TIA’s 2021/22 Annual Performance Plan. |
| **Administration performance targets** |
| Improve on investment decision turnaround times. | Achieve a 4-week turnaround time on investment process for funding applications <R1 million by 31 March 2022.Achieve a 15-week turnaround time on investment process for funding applications R1 million - R15 million by 31 March 2022.Achieve a 26-week turnaround time on investment process for funding applications >R15 million by 31 March 2022. | Achieved an average 18.9-week turnaround time on investment process for funding applications <R1 million by 31 March 2022.Achieved an average 19.6-week turnaround time on investment process for funding applications R1 million - R15 million by 31 March 2022.For funding applications >R15 million received in the year no decisions had been taken by 31 March 2022. | TIA did not meet its turnaround time targets due to its complex approval processes. These matters addressed and the average turnaround time was reduced to approximately 19 weeks. |
| Support women- and youth-owned businesses through procurement initiatives. | Black youth-owned businesses: 10%. | Black youth-owned businesses: 7.4%. | Despite focussed procurement initiatives, procurement from black youth-owned businesses was lower than the annual target. This was attributed to continuation of existing contracts and the specialised nature of procurement in some cases wherein suppliers with youth ownership are limited. |

In relation to targets servicing TIA’s core mandate, TIA met or exceeded performance targets in terms of: the number of technologies licensed or assigned, technologies diffused, knowledge and innovation products produced, postgraduate students and postdoctoral fellows supported, SET support provided to SMMEs, existing Technology Platforms and Technology Stations managed and supported, and new Technology Platforms established. TIA overachieved against the annual targets for the number of products launched (37 against a target of 22), bio-based technologies developed (36 against a target of 15), joint collaborations (34 against a target of 15) and leveraged funds (R755.5 million against a target of R239 million). TIA also established three new technology transfer centres although none was planned.

* + 1. **2021/22 Audit Outcome**

The independent auditor, Rakoma and Associates Incorporated, does not express an opinion or conclusion on the reported performance information. Neither does the auditor evaluate the completeness and appropriateness of the performance indicators. However, the auditor does test the usefulness and reliability of the reported performance information for selected Outcomes. In this case, Outcome 1: Commercialised Innovations, was selected. The auditor did not raise any material findings on the usefulness and reliability of the reported information for this Outcome.

The independent auditor awarded TIA an unqualified audit opinion with no findings; hence, a clean audit for the thirdconsecutive financial year. The auditor further stated that no material findings on compliance with key legislation and no significant deficiencies in internal control were identified.

TIA incurred R292 000 in irregular expenditure in 2021/22, which related to the manner in which the former interim CEO was appointed and the remuneration paid for services rendered in this capacity.Prior year’s irregular expenditure amounted to R11.6 million. TIA did not incur any fruitless and wasteful expenditure in 2021/22.

1. **OVERVIEW OF PERFORMANCE**

The Department remained, for the fourth consecutive year, one of the best performing national departments and four of the five entities that appeared before the Committee were awarded clean audits. In 2021/22, the Department and these entities spent in excess of 95% of their allocated funds and achieved, on average, 85% of their performance targets. Furthermore, the Department and entities reported that they were on track to achieve a greater part of their MTSF targets. However, a key target that will remain unachieved is the enduring challenge to reach the proportion of gross expenditure on R&D (GERD) to GDP of 1.1% by 2024. Instead, the South African National Survey of Research and Experimental Development – Statistical Report 2019/20 showed that GERD as a percentage of GDP at current prices continues to decline, as reflective of the shrinking economy, and was 0.62% in 2019/20, a further decline from the 0.75% and 0.83% recorded in 2018/19 and 2017/18, respectively. Worryingly, business expenditure on R&D also continues to decline. To mitigate these challenges, the collaborative action to implement and fund the priority actions of the STI Decadal Plan and the implementation of the STI Public Budget Coordination Mechanism that seeks to unlock additional funding for STI, are crucial.

For the year under review, performance targets that were not achieved were mainly due to the constrained innovation and technology system, as well as its inherent uncertainty; the lack of demand for certain incentives and funding instruments; competition for high-level skills and factors that were outside the control of the Department and the entities, among others. Under-expenditure was mainly attributed to delays in filling prioritised posts.

The HSRC maintained its overall performance of 90% but regressed in terms of its audit opinion. The new Chairperson of the Board assured the Committee that decisive steps were being taken to implement the recommendations of the AGSA and to address the root causes of this matter, as well as ensure that the needed consequence management is enforced and the necessary monies are recovered from staff.

Notwithstanding their achievements and the progress made in respect of national priorities, the Department, its entities and the NSI as a whole remains underfunded. The sub-optimal level funding has limited the scope and impact of many of the initiatives aimed at increasing the size, coherence and effectiveness of the NSI, as required by the NDP, as well as efforts to ensure greater inclusivity, representation and higher rates of transformation, since the scale of these initiatives are defined by the available budget and not by the need it seeks to address. The sub-optimal level of funding for all entities has also compromised the full implementation of mandates and created capacity challenges as high-level skills seek better/more secure employment elsewhere. Hence, the Department and its entities are increasingly compelled to find additional forms of funding. However, due to the constrained national and global economy, the external funding the entities rely on to execute their functions has also declined. In addition, public procurement regulations require public entities to tender and compete with the private sector for government contracts, usually for work that the entities are mandated to do and for which they receive money from the national fiscus. In this regard, the CSIR reported that potential contract income from the public sector of approximately R450 million could not be realised.

Over the 2023 MTEF, the Department informed the Committee that funding requirements amounted to R3.5 billion, comprising:

* R2.7 billion for the SKA;
* R500 million for the Innovation Fund;
* R197 million to upgrade the Department’s building; and
* R50 million, each, for the catalytic projects of the Hydrogen Society Roadmap and the Space Weather Centre and its operations.

The Space Infrastructure Hub also requires funding of R3.5 billion over the next ten years. The Department has applied for funding through the Budget Facility for Infrastructure for the Space Infrastructure Hub and the SKA. However, the Space Infrastructure Hub requires approximately R1.6 billion over the current MTEF.

The current MTEF funding requirements and challenges of the entities include:

|  |  |
| --- | --- |
| **Entity** | **Funding requirements / Pressures** |
| **CSIR** | Funding required for the Capital Investment Plan. |
| The CSIR intends to establish a Seed Fund for the commercialisation of late stage technologies. Total investment required over the medium-term amounts to R1.2 billion. |
| **HSRC** | Baseline allocation over the 2023 MTEF is not inflation related/linked. The entity is likely to have budget shortfalls on staff costs. |
| Additional funding is required to augment the current budget programme structure. |
| No Capex budget (based on replacement time). The majority of assets is fully depreciated and should be replaced over the medium-term. |
| The HSRC building is aging and there is a need to fund the maintenance plan. Preventative maintenance will cost R10 million. |
| **NRF** | R7 billion is needed over the medium-term for established funding instruments/programmes - where additional funding could enhance the impact of these programmes, or for newly developed instruments, which have not yet been funded. |
| **SANSA** | The baseline allocation falls short of the funding required to fulfil the mandate adequately, operate some sites and meet staff costs. |
| Budgeting for core programmes is a challenge due to funding constraints. |
| Cost of compliance as a Schedule 3A listed Public Entity in terms of the PFMA is substantial. |
| **TIA** | Current funding levels remain largely inadequate for fulfilling the mandate effectively. |
| Funding pressure continues to exist in relation to funds available for operational needs (no inflationary increases incorporated into the baseline allocation over the 2023 MTEF). |
| Funding of R575 million needed for the Seed Fund (an instrument that has created significant impact within the system). |

Overall, the Department with its entities have shown that they can, to a significant degree, spend their allocated budget and achieve their performance targets. However, the lack of coherence and collaboration within the NSI and the current funding and capacity constraints will continue to hamper the realisation of the desired vision of a “whole-of-government approach” to innovation to ensure that greater and inclusive well-being and prosperity is derived through STI.

1. **COMMITTEE OBSERVATIONS**

The Committee commended the Department and the entities for their efforts in delivering on some of the key areas for social and economic development in line with the goals of the NDP and within acute financial constraints.

The Committee’s observations highlight some of the key areas emanating from the interactions with the Department, entities and relevant stakeholders, which require further attention and discussion. Hence, the Committee:

**Department of Science and Innovation**

* 1. Welcomed the Department retaining its clean audit and rating as one of the best performing national departments for a fourth consecutive financial year.
	2. Noted that because the Department was well managed it could direct greater attention to interrogating performance targets and recorded achievement.
	3. Reiterated that the Department must be intentional in its efforts to ensure inclusivity, transformation and representation, especially in relation to gender and people with disabilities, and that adequate funding and coherent planning must support these performance targets.
	4. Expressed their dissatisfaction that the target to award bursaries to pipeline postgraduate students was not met. Noting the shortage of skills in the specialised research areas for which bursaries were offered, the Committee enquired what efforts were underway to ensure that uptake met the available funding, especially since the Committee was inundated with funding requests from postgraduate students.
	5. Stressed that the high number of vacancies and “acting” positions at senior management level must be addressed urgently, especially since this accounted for the bulk of the Department’s under-expenditure.
	6. Reiterated that the Department needed to ensure that its oversight of the entities addresses the findings raised by the AGSA and that planned performance is aligned to the needs of the country.

**Department of Science and Innovation, and Entities**

* 1. Noted that because the Department and the majority of entities were well managed, greater attention could be given to interrogating actual performance and its potential socio-economic impact.
	2. Remained concerned about the measurable impact of STI on the lived realities of citizens.
	3. As with the Department, reiterated that the entities must be intentional in their efforts to ensure inclusivity, transformation and representation, especially in relation to gender and people with disabilities, and that adequate funding and coherent planning must support these performance targets.
	4. Noted that the budget allocations are not sufficient to fulfil the relevant mandates, which seek to facilitate inclusive economic growth and socio-economic development, promote environmental sustainability, support R&D-driven industrialisation, support the development of needed human capital and infrastructure and improve service delivery and government decision making, adequately.
	5. Noted that, despite financial limitations, the Department and entities have shown that they can, to a significant degree, spend their allocated budget and achieve their performance targets.
	6. Noted the efforts to diversify revenue streams through local and international partnerships and the commercialisation of relevant IP portfolios. Especially since the parliamentary grants continue to decline in real terms. Here the Committee cautioned that partnerships and licence and/or infrastructure hosting agreements must address the critical needs of the country.
	7. Noted that, due to funding constraints and the inability to offer market related salaries and service benefits, the science councils were struggling to retain highly skilled SET employees. This further influenced the performance of the entities and the relatively high number of vacancies.
	8. Took cognisance of the 2023 MTEF funding requirements and pressures of the Department and entities and will endeavour to schedule a specific engagement on this, as well as to consider the potential impact of these funding requirements not being met.
	9. Noted a number of instances where the Department and entities exceeded their performance targets, leading the Committee to question the planning processes around target setting.
	10. Questioned, in instances where targets were not achieved, how the Science Engagement programme was being used to address the issues that negatively affected performance achievement.
	11. Welcomed the increased allocation for science awareness and outreach initiatives, especially since it encouraged youth participation in and understanding of science.

**Entities**

* 1. Welcomed the largely positive performance and governance outcomes and noted with concern the regression in the HSRC’s audit opinion.
	2. Welcomed the new Chairperson of the HSRC Board and his assurances that all issues related to the audit opinion will be addressed, that the needed consequence management will be enforced and that the necessary monies will be recovered from staff.
	3. Noted that the HSRC Board would continue engagements around the current funding model so that the future financial sustainability of the HSRC improves.
	4. Stressed that when supply chain management processes are not adhered to, entities must ensure adequate consequence management.
	5. Welcomed that some of the senior management and critical skills vacancies would be filled during the current financial year, especially the CEO positions of the HSRC and SANSA. However, in the case of TIA, the CEO position would be filled once the Minister of Higher Education, Science and Innovation has briefed the new Board on the outcomes of TIA’s institutional review.
	6. Noted the plans by, specifically the CSIR and the HSRC, to attract and retain the needed SET staff.
	7. Noted the support for the commercialisation of locally developed technologies and innovations through the Grassroots Innovation Programme, managed by TIA. However, the Committee maintained that this was inadequate to service the demands of youth, women, people with disabilities and unemployed graduates who wanted to be entrepreneurs.
	8. Noted that SANSA is experiencing issues in relation to the protection of its sites from radio frequency and magnetic interference and that it requires the cooperation of all spheres of government to address.
	9. Noted the delays around the ongoing negotiations to transfer the Houwteq AIT facility from Denel to SANSA, so that this critical infrastructure is not lost.
	10. Noted the negative impact of procurement regulations on the ability of entities to earn contract income from the public sector. Entities are required to compete with private organisations that are larger and/or better resourced; hence, their bids may be lower even if they do not have the same level of expertise as the entities, for these tenders.
	11. Noted the ongoing funding constraints for postgraduate study and welcomed the effort to collaborate with the National Student Financial Aid Scheme and other government entities to consolidate the funding strategy for postgraduate students.
	12. Welcomed the e-certification innovation funded by TIA that automatically certifies documents. The Committee encouraged that these types of innovations should be considered by, for example, the South African Police Service who devote huge amounts of human resources to manually certify documents.
	13. Welcomed the initiative of the NRF to incorporate the use of indigenous languages in its science awareness programme through a partnership with community radio stations in rural areas.
1. **RECOMMENDATIONS**

The Portfolio Committee on Higher Education, Science and Innovation recommends that the:

* 1. The Minister of Higher Education, Science and Innovation (the Minister) and the Department exercise their direct oversight function over the entities more diligently, especially the HSRC to ensure compliance with the requisite governance and legislative prescripts.
	2. The Department and entities provide the Committee, within one month of the National Assembly adopting this report, with their audit action plans and progress reports in relation to consequence management.
	3. The Minister continues his efforts with National Treasury, the private sector and international partners to secure additional funding for the science and innovation portfolio.
	4. The Minister continues to engage National Treasury on a review of the procurement regulations for the science councils.
	5. The Committee establishes the specific detail around additional funding for the Department and entities. The Committee will schedule an engagement in the first term of 2023 to discuss this matter.
	6. The Minister and Department prioritise the finalisation of the institutional reviews of entities and implement the recommendations, especially where it affects the appointment of senior management officials.
	7. The Minister and the Department prioritise filling key vacancies in the Department and affected entities to ensure that the requisite leadership is in place.
	8. The Department and entities must be intentional in their efforts to ensure inclusivity, transformation and representation when filling vacancies.
	9. The Department and entities review their target setting in instances where significant overachievement was recorded.
	10. The Department enhances its collaboration with other government departments, entities and the private sector, to ensure better coordination and a possible consolidated approach around funding programmes for postgraduate students.
	11. The Department and NRF should intensify their efforts with universities and the research community to ensure that the uptake of specialised research bursaries is improved.
	12. The Department prioritises the finalisation of its Transformation Framework, which will address the Committee’s concerns around having a transformed, representative and inclusive science system.
	13. Henceforth, Annual Performance Plans must account for the needed transformation of the science system across all programmes, and demographic information must be presented in full detail.
	14. The Department and entities endeavor, where possible, to expand initiatives aimed at supporting and growing the participation of youth, people with disabilities and unemployed graduates, especially in relation to the commercialisation of local innovations.
	15. The Department explores mechanisms to better report on the impact of science and innovation investment.
	16. The Committee schedules a focused engagement to consider Impact and Inclusivity within the Department and its entities.
	17. The Department provides a brief on the progress and developments around the transfer of the Houwteq AIT facility from Denel to SANSA.

**Report to be considered.**

1. In 2020/21, the targets for bursaries awarded to doctoral students and pipeline postgraduate students had to be reported as not achieved in the Department’s 2020/21 Annual Report because the verification documents from the NRF were not available when performance was audited. However, by the time the Department and the NRF reported to the Committee, the verification process was complete and confirmed that the planned number of bursaries had been awarded in both categories, increasing the Department’s overall performance from 83% to 87%. [↑](#footnote-ref-1)