1. **Report of the Portfolio Committee on Science and Technology on Budget Vote 30: Science and Technology (2018/19), dated 8 May 2018.**

The Portfolio Committee on Science and Technology, having considered Budget Vote 30: Science and Technology and the 2018/19 Annual Performance Plans of the Department of Science and Technology and its entities, reports as follows:

1. **Introduction**

The Constitution of the Republic of South Africa, 1996 and the Rules of Parliament mandates the Portfolio Committee on Science and Technology (the Committee) to oversee the activities and performance of the Department of Science and Technology (the Department) and the entities that report to it. Hence, the Committee annually reviews whether the Department and entities’ performance plans are aligned to national strategic objectives and the appropriated budget.

The entities that report to the Department are the National Advisory Council on Innovation (NACI), the Technology Innovation Agency (TIA), the South African National Space Agency (SANSA), the National Research Foundation (NRF), the Academy of Science of South Africa (ASSAf), the Council for Scientific and Industrial Research (CSIR) and the Human Sciences Research Council (HSRC). The Department and its entities briefed the Committee on 17, 18, 19 and 25 April 2018, where they provided an overview of the strategic context within which they function, discussed priority performance indicators and their concomitant targets and the 2018/19 budget allocations.

1. **Strategic Overview of the Department of Science and Technology**
	1. **Policy mandate**

The 1996 White Paper on Science and Technology, which introduced the concept of the National System of Innovation (NSI), informs the Department’s mandate. A coherent and well-co-ordinated NSI would help South Africa achieve its development priorities; hence, the Department supports the NSI by:

* Co-ordinating the development of policies and strategies, which identify specific priority areas for the country where science, technology and innovation (STI)-related support is required.
* Creating systems and structures to co-ordinate the STI-related work of Government and agencies.
* Developing measurement systems and undertaking analyses to create an evidence base for improving the performance of the NSI.
* Optimising the governance of publicly funded STI institutions to support Government’s priority outcomes.
* Funding research, development and innovation (RDI) infrastructure.
* Funding human capital development at postgraduate level.
* Unlocking STI resources through partnerships with international, continental and multilateral agencies.
* Supporting the technological competitiveness of firms and industry sectors through focussed research and development (R&D) programmes.
	1. **Policy context**

The National Development Plan (NDP) characterises STI as crucial for development since countries that have effectively alleviated poverty by growing their economies, have done so by investing in and developing strong STI environments and capabilities. Hence, the NDP states that South Africa’s NSI needs to be expanded as well as be more effective. This requires that South Africa invest more in R&D, that the STI institutional arrangement must improve the link between innovation and the productive needs of industry, and that Government should collaborate with the private sector to raise the level of R&D in companies.

Furthermore, the NDP outlines three phases of innovation to create an inclusive and dynamic economy that is driven by knowledge. The Department has translated these phases into STI implementable actions and its 2015-2020 Strategic Plan proposes the following:

* **Phase One (2012-2017) – Use knowledge to increase economic efficiency**

The NSI, using what has been achieved to date, will expand research capacity by developing human capital and building institutions. It will continue to support and help improve the productivity and capability of existing economic sectors, as well as support emerging economic sectors through technological innovation.

* **Phase Two (2018-2023) – Use knowledge to enhance industrialisation**

The NSI will continue to accelerate the demographic transformation of the STI sector and use knowledge to enhance economic efficiency. Government will increase R&D investment and commercialisation, and optimise the use of imported technology.

* **Phase Three (2025-2030) – Knowledge-based economy**

This phase is characterised by a significant increase in the number of knowledge workers and high-technology industries that will boost exports and increase South Africa’s capacity to commercialise indigenous technologies. Thereafter, the Department will strive to sustain and expand this progress. These efforts all require a strong, co-ordinated, effective and coherent NSI.

* 1. **2015-2020 Strategic outcome-oriented goals**

The Department’s 2015-2020 Strategic Plan states that the Department will direct its efforts and resources toward the following five strategic outcome-orientated goals:

* Goal 1: Responsive, co-ordinated and efficient NSI – build on previous gains to create a responsive, co-ordinated and efficient NSI.
* Goal 2: Increased knowledge generation – maintain and increase the relative contribution of South African researchers to global scientific output.
* Goal 3: Human capital development – increase the number of high-level graduates and improve their representivity.
* Goal 4: Using knowledge for economic development – derive a greater share of economic growth from R&D-based opportunities and partnerships.
* Goal 5: Knowledge utilisation for inclusive development – accelerate inclusive development through scientific knowledge, evidence and appropriate technology.

To achieve the five strategic outcome-orientated goals, the Department has prioritised the following policy initiatives for the 2018/19 financial year:

* Human Capital Development (HCD) – a model developed to quantify the skills and funding required to achieve the NDP target of 100 PhDs per million of the population will be presented to the Directors-General of the Economics Cluster. Furthermore, recommendations from the “Research training environment in postgraduate engineering programmes” and the “Silent majority” studies will also be implemented.
* South African Open Science Policy – finalise the development of a draft Open Science Framework that will inform the formulation of this policy.
* White Paper on Science, Technology and Innovation – finalise the new STI White Paper, which sets the long term policy direction for the South African government to ensure a growing role for STI in a more prosperous and inclusive society.
* Science, Technology and Innovation Institutional Landscape (STIIL) Review – implement the STIIL Review Roadmap, which outlines how best to build on the existing institutional landscape to enhance the diversity of public research institutions.
* Decadal Plan for STI aligned with the NDP – develop the next STI Decadal Plan (current plan is the Ten-Year Innovation Plan 2008-2018) that will set out the technology focus areas, initiatives and institutional arrangements, funding needs, implementation risks and monitoring and evaluation indicators and intervals over the 2019-2029 period.
* Sovereign Innovation Fund – establish the Sovereign Innovation Fund, which is a joint funding instrument with National Treasury and the Department of Small Business Development to finance innovative ventures and small and medium enterprises in South Africa.
* Strategy for the uptake of locally developed technologies – finalise a strategy to improve the uptake and deployment of South African-derived products and services in addressing service delivery challenges.
1. **Budget 2018**

The 2018 Budget directs spending to the most critical priorities; comprising education, social protection, and inclusive economic growth. It also seeks to raise revenue so that the growth in public debt can be reined-in, and anticipates a steady increase in economic growth.

With regards to STI as an enabler for economic growth and the creation of a conducive environment for small business development, specific mention was made of the R2.1 billion fund (allocated over the medium-term) to benefit innovative small and medium enterprises during the early start-up phase. A phase that is not well-supported by the private sector due to the risks involved. This fund is being developed between the Departments of Science and Technology and Small Business Development and the National Treasury. Additional constraints such as the lack of access to markets and the high cost of data are being addressed via efforts to reduce the cost of data and freeing up broadband spectrum, as well as designating a percentage of public procurement specifically for locally manufactured goods and services.

The Minister of Finance also made specific mention of building sectors where South Africa enjoys comparative advantage, for example, mining, manufacturing, and agriculture. Sectors, among others, where R&D is being used extensively to revitalise and expand existing capacity and ability. Furthermore, R200 billion has been earmarked for economic development, where R18.8 billion is allocated for industrialisation incentives over the medium-term of which an additional allocation of R3.3 billion is allocated for the Economic Competitiveness and Support Package (ECSP) to support growth and job creation in support of the Industrial Policy Action Plan. The ECSP is key for the Department to continue with its Sector Innovation Funds that are being used for its initiatives in support of Government’s Nine-point plan.

1. **Vote 30: Science and Technology (2018/19)**

Over the medium-term and in line with the NDP, the Department will use its budget allocation to produce new knowledge, use this knowledge to stimulate economic and social growth and development, develop human capacity, fund research and innovation, and fund the acquisition and provision of infrastructure. The Department’s budget allocation has increased by R233.3 million from R7.6 billion in the 2017/18 financial year to ***R7.8 billion in the 2018/19*** financial year. This denotes, when adjusted for inflation, a real decrease of 2.3%. The Department’s budget allocation is projected to increase to R8.2 billion in 2019/20 and R8.7 billion in 2020/21. Over the medium-term, Cabinet has approved budget reductions of R186.1 million, which will be effected on spending on goods and services, and on the baseline budgets of entities.

In terms of economic classification, the apportionment of the Department’s 2018/19 budget allocation of R7.8 billion remains the same as in previous years and comprises Current payments of R603.3 million (7.8%), Transfers and subsidies of R7.2 billion (92%) and Payments for capital assets of R12.2 million (0.2%). The Department’s 2018 APP states that as of February 2018, the vacancy rate was 12.4%, of which 3.5% was at a senior management level. Budget cuts have meant that these vacancies cannot be filled. Furthermore, the Department’s 2018 APP states that, due to constraints on the salaries budget, the vacancy rate will be capped at 20% for 2018/19 and 23% for 2019/20.

During the Committee’s interaction with the Department, the Minister of Science and Technology (the Minister) stated that how Government funds STI needs urgent and heightened scrutiny, since due to the nature of scientific endeavour, having sustainable funding over the lifetime of STI initiatives is key to achieving the desired outcomes and impact. Therefore, budget cuts within a period where funding has been committed, are detrimental to a successful outcome. Furthermore, the Minister stated that an aggressive increase in RDI investment is needed for science and technology to fulfil a greater role in economic growth, to adequately transform the sector, and to increase South Africa’s global competitiveness.

* 1. **2018/19 Budget allocation per Programme**

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

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

These programmes fulfil the Department’s mandate of realising the full potential of science and technology in social and economic development through the development of human resources, research and innovation. The percentage budget allocation to the Programmes (Table 1) and sub-programmes remains virtually the same as in previous financial years.

**Table 1: Budget summary of the Department of Science and Technology**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Programme****R’ million** | **2017/18****Adjusted appropriation** | **2018/19****Expenditure estimate****(percentage of total budget)** | **Nominal percentage change in 2018/19** | **Real percentage change in 2018/19 (inflation-adjusted)** |
| 1. Administration | 376.0 | 383.8 (4.9%) | 2.09 | -3.24 |
| 2. Technology Innovation | 1 075.1 | 1 131.7 (14.5%) | 5.27 | -0.22 |
| 3. International Co-operation and Resources | 132.4 | 136.4 (1.8%) | 3.04 | -2.34 |
| 4. Research, Development and Support | 4 350.1 | 4 360.3 (56%) | 0.23 | -4.99 |
| 5. Socio-Economic Innovation Partnerships | 1 623.6 | 1 778.3 (22.8%) | 9.52 | 3.81 |
| **Total** | **7 557.2** | **7 790.5** | **3.1%** | **-2.29%** |

The budget allocation is aligned to the priorities of strengthening and expanding STI human capital development and ensuring that innovation and knowledge underpin the government’s growth strategy. Hence, Programmes 2, 4 and 5, receives 93.3% of the Department’s total budget allocation.

Important to note within the performance indicators selected to appear in the 2018 Estimates of National Expenditure (ENE), is that over the medium-term, the numbers of postgraduate students supported and research awards granted remain stagnant. Responding to previous recommendations from the Committee to ensure that performance indicators better reflect the work of the Department and to account for the effect of budget cuts; the Department have made changes to a range of its 2015-2020 Strategic Plan proxy indicators. For the 2018/19 financial year, the Department has 23 strategic objectives, which have been translated into 43 performance indicators.

* + 1. **Programme 1: Administration**

Programme 1 provides strategic leadership, management and support services to the Department and has five sub-programmes. These are Ministry, Management, Corporate Services, Governance and Office Accommodation. The work of this Programme focuses on administration, and policy and planning.

**Table 2: Budget summary of Programme 1: Administration**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Programme****R’million** | **2017/18****Adjusted appropriation** | **2018/19****Expenditure estimate** | **Nominal percentage change in 2018/19** | **Real percentage change in 2018/19 (inflation-adjusted)** |
| Ministry | 4.5 | 5.1 | 15.33 | 9.32 |
| Management | 115.9 | 119.6 | 3.23 | -2.15 |
| Corporate Services | 242.5 | 243.3 | 0.32 | -4.91 |
| Governance | 8.3 | 10.7 | 28.71 | 22.00 |
| Office Accommodation | 4.8 | 5.0 | 5.20 | -0.28 |
| **TOTAL** | **376.0** | **383.8** | **2.1** | **-3.24** |

Programme 1’s R383.8 million allocation will mainly be spent on salaries (R174 million) and on Goods and services (R183.3 million). R14.3 million is allocated to Transfers and subsidies to non-profit institutions. Key initiatives that will continue in 2018/19 is the Business process mapping exercise, modernisation of the Information Technologies (IT) unit, processes to mitigate the effects imposed by the constraints on the salaries budget, and efforts to reconfigure the Directorate: Strategy and Planning to better serve the Department and the NSI.

To date, the administrative mechanisms implemented by Programme 1 have ensured unqualified or clean audits for the Department and its entities, as well as recognition from the Presidency as being one of the best managed national departments. The intention to reposition and redefine the administrative function so that it continues to improve on the support provided to the Department and its entities remains.

**a) Programme 1 Entity: National Advisory Council on Innovation (NACI)**

NACI aims to provide evidence-based advice to the Minister of Science and Technology and, through the Minister, Cabinet on STI matters. To address the challenges facing the NSI, NACI adopted four new strategic outcome-oriented goals as the basis for its 2016-2021 Strategic Plan. These in essence comprise building internal capacity, improving operations, and improving data analysis and advice.

Key outputs for 2018 include:

* Three STI advice documents
* The State of STI Report
* Two NSI monitoring and evaluation reports
* Continued implementation of the National STI Information Portal
* Finalising the foresight exercise for the new STI White Paper and Decadal Plan
* Implement NACI’s Knowledge Management System
* The term of the current NACI Council ends July 2018; hence, the aim is to have the Institutional Review Report available at the same time

NACI’s operations are administered by Programme 1. The budget allocation for 2018/19 is R20 million (R19.5 million in 2017/18), which comprises R11 million for salaries and R9 million for goods and services. NACI, in terms of fulfilling its mandate, continues to be hampered by being located within the Department and being inadequately resourced. However, within its current structure and location, NACI will continue to strive to package its advice to the Minister and Cabinet in a manner that will allow the potential of innovation for socio-economic development to be more evident. NACI will also focus on increasing its staff capability and organisational capacity. The term of the current NACI Council ends in July 2018 and an institutional review is being undertaken. The results of the institutional review will be used to inform the focus and work of the new Council.

* + 1. **Programme 2: Technology Innovation**

Programme 2 enables R&D in space science and technology, energy security, the bioeconomy, and in the areas of nanotechnology, robotics, photonics and indigenous knowledge systems (IKS), and promotes the realisation of commercial products, processes and services from these R&D initiatives. In addition, through the implementation of enabling policies and interventions along the entire innovation value chain, promotes the protection and utilisation of intellectual property (IP), technology transfer and technology commercialisation. Programme 2 has four sub-programmes and one specialised service delivery unit (SSDU). These are Space Science, Hydrogen and Energy, Bio-innovation, Innovation Priorities and Instruments (IPI) and the National Intellectual Property Management Office (NIPMO).

**Table 3: Budget summary of Programme 2: Technology Innovation**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Programme****R’million** | **2017/18****Adjusted appropriation** | **2018/19****Expenditure estimate** | **Nominal percentage change in 2018/19** | **Real percentage change in 2018/19 (inflation-adjusted)** |
| Space Science | 174.9 | 161.9 | -7.45 | -12.27 |
| Hydrogen and Energy | 156.8 | 167.8 | 7.03 | 1.45 |
| Bio-innovation | 156.1 | 178.4 | 14.31 | 8.35 |
| Innovation Priorities and Instruments | 540.5 | 572.7 | 5.96 | 0.44 |
| National Intellectual Property Management Office | 46.8 | 50.9 | 8.64 | 2.97 |
| **TOTAL** | **1 075.1** | **1 131.7** | **5.3** | **-0.22** |

Programme 2 receives R1.13 billion of the Department’s total allocation. Approximately 89% (R1 billion) is allocated to Transfers and subsidies, where TIA and SANSA receive the largest allocations. The IPI sub-programme continues to receive the largest share of Programme 2’s budget, that is 51% (R573 million). The IPI sub-programme supports and strengthens the policy initiatives that aim to create and sustain an enabling environment for innovation, technology development and the commercialisation of products from publicly funded R&D. The lowest allocation, approximately 4.5% (R50.9 million), goes to NIPMO. The remaining funds are relatively equally distributed between the Space Science (R161.9 million), Hydrogen and Energy (R167.8 million), and Bio-innovation (R178.4 million) sub-programmes. The largest allocation decrease is to the Space Science sub-programme and equals R13 million. The remaining sub-programmes all receive above-inflation allocation increases.

**a) Programme 2 Entity: Technology Innovation Agency (TIA)**

TIA aims to support, stimulate and intensify technological innovation to improve economic growth. TIA is positioned as a development finance institution that provides “gap” funding for technology development projects (seen as high-risk investments; hence, there is a lack of commercial funding) with high social and economic impact. Conversely, the level of the current budget imposes limits on TIA’s risk appetite and by extension the sectors in which it operates. TIA’s goals are to; support commercialisation of technological innovations; increase access to infrastructure for technology development; and stimulate an agile and productive NSI. The investment and/or support programmes that drive TIA’s work are grouped under the Innovation Funding and Pre Commercialisation Support initiative and the Innovation Enabling and Support initiative. Key outputs for TIA include technology development funding that will enhance or develop technology-based companies that will also lead to job creation. As well as, creating an enabling environment for technology innovation that will lead to job creation, increased company turnover and technology support funding for small and medium enterprises.

TIA’s total 2018/19 budget is R536.6 million (R500 million in 2017/18), which comprises R420.3 million from the Department and R116.3 million from other funding sources (22% of total). TIA plans to spend 35% (R189.7 million) of its budget on administration and the remaining 65% (R346.9 million) on project disbursements/investments. The increased expenditure on administration from 30% to 35% is to allow for additional staff resources to enable TIA to achieve its medium-term growth targets. TIA has shown that for every R1 million that it spends, it creates four direct jobs; and over the last four years, has created 2 000 direct jobs.

TIA’s financial sustainability remains a concern where an ideal budget for innovation project disbursements would be R1 billion. Hence, TIA will in 2018/19 seek to gain greater access to the R15.8 billion allocated across Government for innovation, science and technology; apply to be included in the 11th Schedule of the Income Tax Act so that TIA can benefit from a tax exemption on its grants; and apply to retain surplus funds. TIA is assessing its various industry support initiatives to determine how these could be scaled up, not only in terms of the numbers of enterprises receiving support, but also in terms of the nature and impact of the support given. TIA is also planning to undertake a national marketing and awareness campaign to enhance its visibility across society and all relevant industry sectors.

**b) Programme 2 Entity: South African National Space Agency (SANSA)**

SANSA aims to position “South Africa as an international hub for space solutions for the world of the future”. To achieve this, SANSA’s five strategic goals are to address national challenges through space applications; lead high-impact R&D; develop human capital and ensure transformation; enhance the competitiveness of South Africa’s space industry; and develop global partnerships. SANSA has since its inception been sub-optimally funded and the limitations that have resulted are:

* SANSA’s inability to fully meet its mandate, especially with regards to global navigation satellite services (GNSS) and satellite telecommunications solutions and applications
* Limited support to the local space industry
* As an implementing agency, SANSA’s salary bill accounts for its major cost

Key cost drivers remain the cost of access to earth observation satellites, maintaining data storage facilities, attracting and retaining high-end skills, and developing the earth observation satellite EO-Sat 1.

The Parliamentary grant allocation to SANSA from the Space Science sub-programme is R138 million (R131 million in 2017/18), it also receives R6.9 million as a ring-fenced grant (down from R132 million in 2017/18) and expects to receive R76.7 million from contract and other income. Hence, SANSA’s total estimated revenue for 2018/19 is R222 million (R391 million in 2017/18). The decline in the ring-fenced grant allocation is related to the funding for the development of EO-Sat 1 that has not yet been confirmed. This is further reflected in the decline, from R120 million to R10 million, of the allocation to the Space Engineering programme. Because this sector is dependent on highly specialised skills, which are also in short supply in South Africa, the salaries budget remains a key cost driver and will account for R124 million (56%) of SANSA’s total expenditure. In essence, the baseline allocation to SANSA to fulfil its mandate is R138 million, its salary budget is R122 million, leaving SANSA with R14 million to establish, resource and run a national space programme. The establishment of SANSA merged three highly technical organisations, all with high-end infrastructure to maintain and upgrade as needed. It is this infrastructure from which SANSA generates it contract income. In 2018/19, SANSA will only have R5 million for capital expenditure. Only the allocation to the Earth Observation programme increases from R64 million to R67 million for the acquisition, distribution and storage of satellite imagery.

Due to sub-optimal funding levels and the funding for the further development of EO-Sat 1 not yet confirmed; key risks for SANSA include:

* Extended delays to the EO-Sat 1 programme, which requires R318 million in 2018/19
* Inadequate support to the South African space industry
* Inability to develop the necessary human capacity. Due to constrained finances, SANSA cannot employ more researchers. It also can’t employ the students it trains.
* Loss of credibility
* Loss of income
* Downgrade in services offered
* Inability to fulfil mandate

SANSA is regarded globally, based on merit, as the preeminent space agency and the strategic leader in space issues, on the African continent. Despite its dire financial circumstances, SANSA will continue to deliver on its mandate as best it can and will also be tabling a new Strategic Plan for 2018 – 2023 that seeks to ensure that South Africa participates in new opportunities within the space sector.

* + 1. **Programme 3: International Co-operation and Resources**

Programme 3 supports South Africa’s foreign policy through science diplomacy. Hence, it develops, promotes and manages international relationships, opportunities and science and technology agreements that both strengthen the NSI and enable an exchange of knowledge, capacity and resources between South Africa and its international partners, with a focus on supporting STI capacity building in Africa. Programme 3 has three sub-programmes; namely, Multilateral Co-operation and Africa, International Resources and Overseas Bilateral Co-operation. Programme 3 is allocated R136.4 million (R132.4 million in 2017/18), with R68.9 million allocated to Current payments and R67.5 million allocated to Transfers and subsidies. The Transfers and subsidies allocation is further broken down into R14.9 million to the NRF who manages bilateral co-operation agreements on behalf of the Department, R43.1 million for International multilateral agreements and R9.4 million for African multilateral agreements. The International Resources sub-programme receives R63 million (46%), the largest share of this Programme’s allocation, followed by Overseas Bilateral Co-operation receiving 31% and the remaining 23% allocated to Multilateral Co-operation and Africa.

Key outputs for Programme 3 include securing international investment for STI research and human capital development, securing access to international training programmes and STI infrastructure for South African students, facilitating funding for and supporting regional and continental STI initiatives, and occupying leadership positions and influencing decisions at intergovernmental STI fora.

Programme 3 needs a budget that will allow for strategic co-investment with international partners. The Department has shown that for every R1 it invests, it can secure up to R10 from an international partner. Bilateral and multilateral co-operation initiatives also require South Africa to fund its own costs under bilateral agreements and cover its membership in multilateral organisations. Programme 3 receives a nominal increase in its 2018/19 allocation, but once adjusted for inflation, this represents a real decrease of 2.3%.

* + 1. **Programme 4: Research, Development and Support**

Programme 4 seeks to provide an enabling environment for research and knowledge production that promotes the strategic development of basic sciences and priority science areas through science promotion, human capital development and the provision of research infrastructure and relevant research support, in pursuit of South Africa’s transition to a knowledge economy. Programme 4 has four sub-programmes; namely, Human Capital and Science Promotions, Science Missions, Basic Science and Infrastructure, and Astronomy.

**Table 4: Budget summary of Programme 4: Research, Development and Support**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Programme****R’million** | **2017/18****Adjusted appropriation** | **2018/19****Expenditure estimate** | **Nominal percentage change in 2018/19** | **Real percentage change in 2018/19 (inflation-adjusted)** |
| Human Capital and Science Promotions | 2 424.8 | 2 457.1 | 1.33 | -3.95 |
| Science Missions | 214.2 | 223.0 | 4.07 | -1.35 |
| Basic Science and Infrastructure | 976.6 | 927.6 | -5.02 | -9.97 |
| Astronomy | 734.5 | 752.6 | 2.47 | -2.87 |
| **TOTAL** | **4 350.1** | **4 360.3** | **0.2** | **-4.99** |

The marginal increase in Programme 4’s budget, once adjusted for inflation, represents a real decrease of 5%, with the Basic Science and Infrastructure sub-programme being subjected to a R49 million decrease in its allocation. Programme 4’s allocation is largely for Transfers and subsidies (R4.30 billion), the bulk of which is transferred to the NRF. Budget cuts within Programme 4 have meant that the number of students who receive bursaries, the number of students who receive work preparation (interns), and the number of infrastructure grants awarded all had to be reduced.

**a) Programme 4 Entity: National Research Foundation (NRF)**

The NRF promotes and supports research in all fields of science, and provides research funding and platforms through national research facilities and science engagement activities. One of its key goals is to ensure that South Africa contributes at least one percent to global R&D output by 2020 and that this knowledge output benefits society.

The NRF’s total revenue for 2018/19 is projected to be R4.3 billion (R5 billion in 2017/18). The total revenue consists of the Parliamentary grant of R905 million and contract income of R3.4 billion (R2.8 billion from the Department, which was R3.6 billion in 2017/18). This represents a 20% decline in total revenue in real terms. The NRF’s 2018 APP states that the continued decline in real terms of the Parliamentary grant poses significant risk to the sustainability of the NRF; and because 78% of its total budget is predetermined through contracts, the NRF does not possess the funding agility to respond to shifts in the NSI. The NRF APP further states that, “The cost of delivering on the mandate of the NRF is significantly outpacing the growth of the Parliamentary grant allocation. This includes, but is not limited to, inadequate reach and value of postgraduate student bursaries, which do not increase annually in accordance with the Consumer Price Index (CPI). Similarly, the value of grants to researchers have not increased, and in some instances have been reduced. In addition, maintenance, renewal and acquisition of necessary research infrastructure platforms and related equipment have been significantly compromised.” Currently, annual growth in expenditure stands at approximately 8%; whereas, the annual growth of the Parliamentary grant has approximately been 5.3%. Therefore, the declining (in real terms) Parliamentary grant presents a specific risk to the National Research Facilities, which it largely funds. Furthermore, the fluctuation and volatility of the rand negatively impacts the procurement of specialised imported materials and equipment. The National Research Facilities are also unable to renew their research workforce or renew, replace or acquire necessary research infrastructure. The lack of adequate resources has meant that the numbers of students and researchers that can be supported have had to be reduced; and no new calls for infrastructure grants will be issued.

Expenditure across the NRF’s programmes is projected to be 59% to the Research and Innovation Support and Advancement (RISA) business unit, 25% to the National Research Facilities: Astronomy, 11% to the National Research Facilities: Biodiversity, Environmental and Nuclear Sciences, 3% for Science Engagement, and 2% for Corporate.

Strategically, across its programmes, the NRF is focussed on achieving positive impact (rather than just increasing numbers) with the resources at its disposal, and believes that transformation of the STI sector requires deliberate, well considered interventions. This requires a long-term commitment to the allocation of optimal, sustainable and relevant resources since the transformation framework being developed by the NRF encompasses the students and researchers, the STI focus areas that it supports, as well as the equity needs of the NRF itself.

**b) Programme 4 Entity: Academy of Science of South Africa (ASSAf)**

ASSAf promotes outstanding achievement in all fields of scientific enquiry, honours excellence, and provides evidence-based scientific advice to government and other stakeholders. Key outputs include fostering collaborations among global science organisations, raising awareness of and increasing the quality of South Africa’s scholarly output, promoting young scientists and women for science activities, STI policy advice for government, and improving scientific writing for research publishing. As such, ASSAf’s activities are structured within four programmes; namely, Governance and Administration, Scholarly Publishing, Liaison, and Science Advisory.

ASSAf’s 2018/19 income is projected to be R38.7 million, where R25.7 million is the baseline allocation from the Department who also allocates R9.1 million through various contracts. ASSAf will raise the additional revenue from its publications, membership fees and other income. Since ASSAf’s activities are labour-intensive and require highly skilled staff, compensation of employees remains a key cost driver, accounting for approximately 76% of total expenditure over the medium-term.

Sub-optimal funding, a small staff compliment and increased requirements imposed by ASSAf complying fully with the Public Finance Management Act (PFMA) remains a challenge. Uncertainty with regards to PFMA-compliance has been hampering ASSAf’s operations since 2016 and will be addressed via amendments to the Science and Technology Laws Act, which will be tabled in Parliament during the third term of 2018. It is also the considered view that ASSAf would benefit from having a deputy Chief Executive Officer and a permanently appointed President of Council to further its mandate. ASSAf is also hampered by a lack of awareness of its capability, in that its membership comprises some of the best minds in South Africa, who voluntarily offer their time and expertise to generate evidence-based advice for policy makers. Raising its profile and creating awareness of its stature is; therefore, of utmost importance. ASSAf will continue its efforts to increase and diversify its membership, increase the access South African researchers have to scholarly journals, improve the quality of South African scholarly publications, grow the number of academies in the region and Africa, and provide evidence-based scientific advice, as well as ensuring that the advice is considered and used.

* + 1. **Programme 5: Socio-Economic Innovation Partnerships**

Programme 5 seeks to enhance the growth and development priorities of government through targeted STI interventions and the development of strategic partnerships with all levels of government, industry, research institutions and communities. Programme 5 has four sub-programmes; namely, Sector Innovation and Green Economy, Innovation for Inclusive Development, Science and Technology Investment, and Technology Localisation, Beneficiation and Advanced Manufacturing.

**Table 5: Budget summary of Programme 5: Socio-Economic Innovation Partnerships**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Programme****R’million** | **2017/18****Adjusted appropriation** | **2018/19****Expenditure estimate** | **Nominal percentage change in 2018/19** | **Real percentage change in 2018/19 (inflation-adjusted)** |
| Sector Innovation and Green Economy | 984.0 | 1 036.8 | 5.37 | -0.13 |
| Innovation for Inclusive Development | 356.6 | 354.8 | -0.50 | -5.69 |
| Science and Technology Investment | 25.3 | 27.3 | 8.11 | 2.48 |
| Technology Localisation, Beneficiation and Advanced Manufacturing | 257.8 | 359.3 | 39.4 | 32.13 |
| **TOTAL** | **1 623.6** | **1 778.3** | **9.5** | **3.81** |

Programme 5 receives R1.8 billion of the Department’s total budget and allocates R1.7 billion to Transfers and subsidies. These transfers comprise R563 million for Departmental agencies and accounts and R963 million for Public corporations and private enterprises. The Sector Innovation and Green Economy sub-programme receives 58% (R1 billion) of the total allocation to establish high impact science research that would support the growth of environmental technologies and services in South Africa. The Technology Localisation, Beneficiation and Advanced Manufacturing sub-programme receives 20% of the total allocation to identify and grow STI capabilities that will improve the competitiveness of existing industries and facilitate the development of new R&D-led industries. This sub-programme receives a real (inflation-adjusted) increase of 32%, once again showing that initiatives that are focussed on directing economic growth are being given increased resources. R354.8 million is allocated to the Innovation for Inclusive Development sub-programme to support the use of science and technology-based innovations to address the triple challenge of poverty, unemployment and inequality by creating sustainable jobs, building sustainable human settlements and enhancing service delivery.

The work done under Programme 5 supports inclusive development, the development of a green economy, exploitation of knowledge for economic benefit, and the development of indicators and instruments to measure and monitor STI investments and the performance of the NSI. It is also the only Programme that receives a real increase in its 2018/19 allocation, reflecting the need to use the STI knowledge generated to create and grow industries and jobs, and improve the living conditions of South Africans. In this regard, collaboration among all stakeholders, co-operative governance, planning alignment and relevance, and adequate resources and skills are all key to achieving the goals of this Programme.

**a) Programme 5 Entity: Human Sciences Research Council (HSRC)**

The HSRC aims to be a research organisation that advances social sciences and humanities to help address pressing social issues such as inequality and poverty and enhances human welfare and development. Hence, its strategic intent is to address key priorities facing South Africa through its research, and to generate new knowledge that helps us understand the changing human and social environment in which we live. Key outputs in relation to its mandate include, fostering public dialogue and producing publications, researching and analysing developmental problems, promoting the African research agenda, developing research capacity for the humanities, and developing policy briefs that will inform government policy and evaluate its implementation.

The HSRC’s total projected income for 2018/19 is R570 million (R303.7 million (53%) from the Department). Due to the high level of skill the HSRC’s mandate requires, salaries remain a key cost driver and accounts for R293.6 million of the HSRC’s total expenditure. The second largest expenditure item is research costs of R116 million.

Funding constraints and its inability to attract and retain the necessary skills continue to negatively affect the work of the HSRC, resulting in a number of performance targets being reduced. Its efforts to transform the race and gender of its senior research capacity is hampered by the dearth of these skills within the sector and having to compete with institutions where researchers do not have to secure external contract research projects to supplement their salaries. Current visa requirements also hinder the ability of the HSRC to appoint researchers from other African countries. Operational costs continue to increase in relation to its ageing Pretoria building and the data systems that it has to maintain and secure.

**b) Programme 5 Entity: Council for Scientific and Industrial Research (CSIR)**

The CSIR’s mandate is to foster industrial and scientific development in the national interest through multidisciplinary research and technological innovation. The strategic objectives of the CSIR are:

* Build and transform human capital
* Conduct high-quality research to foster scientific development
* Conduct relevant research to foster industrial development
* Infrastructure renewal and development
* Financial sustainability and good governance

The CSIR derives its revenue from grants from the Department, contract R&D income from public and private sectors both locally and internationally, and income from IP and technology transfer initiatives. The total projected revenue for 2018/19 is R2.7 billion (R766.8 million Parliamentary grant). The CSIR projects zero profit for 2018/19. Due to the highly skilled nature of the CSIR’s work, compensation of employees remains a key cost driver and, over the medium-term, accounts for approximately 58% of the CSIR’s total expenditure.

The CSIR’s 2018 Shareholder Compact states that a key concern is declining financial sustainability due in part to the loss of traditionally lucrative long-term contracts; working with external partners, especially the private sector, has become more difficult; and problematic state-owned entities. In addition, the growth rate for the STI skills base is declining and the CSIR has not been significantly re-capitalised in the past three decades. Modernising the CSIR Campus will require significant government support. The latter will be implemented over 10 to 15 years through the Campus Master Plan, which will require approximately R5 billion.

The current financial situation has had the following effects on the CSIR:

* Due to the demand for senior researchers and PhDs across multiple sectors, the CSIR has a staff turnover rate of approximately 10% per annum; whereas, the industry average is approximately 7% per annum. It projects its 2018/19 STI staff component to be similar to what it had in 2014/15 (i.e. 1869, down from 1966 in 2016/17); hence, performance targets have to be reduced accordingly.
* The CSIR raises most of its contract income through R&D projects from the public sector. Hence, the declining national investment in R&D and the requirement for the CSIR to compete for tenders has adversely effected this income stream.

Due to the constraints imposed by its 2018/19 finances and the projected zero profit, the CSIR sees this as a consolidation year where costs will have to be contained and certain performance targets will have to be reduced. It is hoped that projected financial improvements in the outer year of the current medium-term will result in positive growth across all performance indicators. Despite the current challenges, the CSIR remains committed to its mandate and will continue to implement a range of initiatives to develop the required human capacity, conduct relevant research for scientific and industrial development, develop and provide RDI infrastructure, and promote the benefits and enhance the understanding of STI across society.

1. **Committee Observations**

Over the medium-term, Cabinet has approved budget reductions of R186.1 million, which will be effected on spending on goods and services, and on the baseline budgets of entities. The Minister of Finance responded to the Committee’s 2017 Budget Review and Recommendation Report request for additional funds for STI, as follows:

“...allocation grows at an annual average rate of 4.8 per cent. Over the medium term, the department transfers over 90 per cent of its total budget to its entities to fund research and development that drives science, technology and innovation. Historical spending trends suggest that the department’s six entities are adequately funded to deliver on their mandate given the yearly applications to the National Treasury to retain surplus funds. The DST must intensify its efforts to realise co-investment opportunities with the private sector.”

The Committee noting the response from the Minister of Finance and being cognisant of the fiscal constraints, responds as follows:

The APPs of the Department and its entities state that their performance delivery has been structured around the budgets that have been allocated to them, and not according to all the responsibilities that they are mandated to fulfil. This has meant that the STI mandate cannot be fully implemented at the current levels of funding. The key cost drivers for STI include: attracting and retaining the necessary skills, funding for skills development and transformation, funding for STI entities to fulfil mandates, funding for infrastructure acquisition and maintenance, funding for full-scale implementation of initiatives over the lifetime of these initiatives, and funding for new responsibilities.

Science related inflation is higher than standard inflation. Hence, allocations that grow in line with standard inflation only marginally assist the STI objectives. Allocation increases below standard inflation further exacerbate the sub-optimal funding environment that prevails. Furthermore, relying on external funding to fulfil government-specific mandates poses the risk that R&D focus may shift to the needs of the funder and away from Government’s priorities.

In concluding its deliberations on Budget Vote 30: Science and Technology, the Committee noted the following:

* + The Committee welcomed the re-appointment of the Director-General, Dr P. Mjwara. Having served the Department for more than 15 years, the Committee commends his commitment and is confident that his expertise will positively guide the Department through the current financial crisis.
	+ The Committee commended the Department and the entities for the work they do and for formulating coherent strategies and performance plans.
	+ Science, technology and innovation play a crucial role in driving economic transformation and social upliftment. Hence, the Committee was pleased with the efforts of the Department and its entities to align their activities to support regional and national plans and strategies that seek to stimulate the economy of South Africa and the region.
	+ Transformation of the STI sector in terms of human capacity, organisational composition, and the R&D focus areas; requires deliberate, well considered, and adequately resourced interventions. Hence, the Committee welcomes the development and the imminent release of a new STI White Paper and the plans to develop the next STI Decadal Plan. These policy interventions will help to chart a new trajectory for the future development and enhancement of South African STI.
	+ Crucial to the transformation of the human capacity in the STI sector, is the creation and continued growth of a pipeline of students interested in pursuing careers in science, mathematics and engineering. This can only be achieved if our education system provides all children, irrespective of circumstance, the same structure and level of opportunity.
	+ That it is crucial that STI be placed at the centre of the work of Government. For the NSI to have an impact on the economy, it must be optimally resourced and co-ordinated. Therefore, the Committee welcomed Cabinet’s approval of a STI budget co-ordination framework that is aligned to the Medium-Term Expenditure Framework (MTEF) and will be introduced in 2018/19.
	+ The Department and the entities have a mandate to deliver on Government’s national priorities. Hence, the Committee is extremely concerned about the evident financial sustainability challenges affecting the work of the Department and the entities. The entities most severely affected are SANSA, TIA, HSRC and the CSIR. In addition, infrastructure and skills are vital to knowledge generation. Therefore, the inability to:
		- attract and retain highly-skilled individuals;
		- grow human capital development programmes;
		- employ the students that the entities spend a lot of time training and supervising;
		- maintain and acquire needed infrastructure;
		- secure funding over the full lifetime of initiatives;

all present serious challenges to attaining the goals set for the NSI by the NDP Vision 2030.

* + The entities are constrained by a lack of adequate investment. This necessitates them to source external contract funding, which may then deflect the focus of the work done away from national interest to that of the contractor. Furthermore, the primary function of researchers is compromised, as they are now required to undertake administrative tasks such as sourcing contracts and preparing tender documents for research funding. Entities are then also required to compete with 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.
	+ Creating an enabling environment for innovative small and medium enterprises is crucial. Hence, the Committee welcomes the efforts to establish the Sovereign Innovation Fund, the development of a policy for Government to procure 30% of its good and services from South African companies, and the development of a policy to increase the uptake of locally manufactured products.
	+ Intergovernmental co-ordination and partnerships are instrumental in ensuring that the work done by the Department and the entities is used and implemented. These relationships are crucial to ensuring that crosscutting activities are better co-ordinated, and resources are not wasted.
	+ Enhanced co-ordination is also necessary at Parliament among the various portfolio and select committees in instances where science and technology issues are transversal. This especially relates to improving the access to science and mathematics education in the Early Childhood Development Phase, and the efforts and policies to create a more enabling environment for innovative small and medium enterprises.
	+ Awareness and understanding of science and knowing what South African STI institutions are doing, is key to stimulating and improving the public discourse around the advantages of implementing a science policy for social wellbeing and economic growth. However, existing awareness initiatives have been reduced due to budget cuts.
	+ The current total investment in R&D is inadequate to drive the economic transformation agenda of South Africa and would need to be increased to effectively meet the goals of NDP Vision 2030.
1. **Committee Recommendations**

The Portfolio Committee on Science and Technology, having considered the proposed Budget Vote 30: Science and Technology, recommends that:

* + All mechanisms to increase the budget allocation to the Department of Science and Technology be pursued by the Ministers of Science and Technology and Finance. This includes:
		- Urgent attention be given to implementing the STI budget co-ordination framework. The Committee will engage with the Interdepartmental Task Team on implementation progress within the third term of the 2018 parliamentary programme.
		- Government considering a process within current tender regulations that could assist public STI institutions, with the required expertise, to gain increased access to government research contracts that fall within their mandate to execute. The Committee will schedule a briefing to facilitate discussion on this matter within the third term of the 2018 parliamentary programme.
		- Government considering mechanisms that will ensure that public STI institutions have greater, and possibly preferential, access to the R15.8 billion allocated in 2018/19 to innovation, science and technology across all government departments.
	+ The Department and entities, in light of the funding crisis, find innovative ways to increase their efforts to be more visible to the public and drive the national dialogue on STI and its relevance to addressing critical national issues.
	+ The House adopts Budget Vote 30: Science and Technology.

The Democratic Alliance and the Economic Freedom Fighters reserve their opinion on the Budget Report.

**Report to be considered.**