

Report of the Portfolio Committee on Science and Technology on Budget Vote 30: Science and Technology (2017/18), dated 16 May 2017.

The Portfolio Committee on Science and Technology, having considered Budget Vote 30: Science and Technology, and the 2017/18 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 3, 4 and 10 May 2017, where they provided an overview of the strategic context within which they function, discussed priority performance indicators and their concomitant targets and the 2017/18 budget allocations.

2. Strategic Overview of the Department of Science and Technology

2.1. 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 currently supports the NSI by:

- Co-ordinating the development of country-level policies and strategies, such as the 2002 National Research and Development Strategy (NRDS) and the 2007 Ten-Year Innovation Plan (TYIP), which identify specific priority areas for the country where science, technology and innovation (STI)-related support is required.
- Creating systems and structures to coordinate 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.

Over the next five years, the Department aims to intensify its efforts to exploit and use knowledge for economic and inclusive development, and expand and transform South Africa's research capability.

2.2. 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 and, therefore, be aligned with the sectors that will realise the country's growth objectives. 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, public investments in research infrastructure should be focussed on and fulfil the needs of a modern economy.

The 2014-2019 Medium-Term Strategic Framework (MTSF) represents the first phase of implementation of the NDP and commits Government to 14 key outcomes. The Department contributes to Outcomes 3, 4, 5, 6 and 10. Furthermore, the Department also supports, through a series of initiatives, the Nine-Point Plan, which seeks to increase the rate of South Africa's economic growth. Specific areas where the Department contributes to the Nine-Point Plan include:

- Revitalisation of agriculture and agro-processing.
- Increasing the impact of the Industrial Policy Action Plan (IPAP).
- Beneficiation of mineral wealth.
- Unlocking the potential of small business and rural and township enterprises.
- Growing the oceans economy through Operation Phakisa.
- Resolving the energy challenge by advancing alternative energy sources.
- Scaling-up private sector participation in R&D.

2.3. 2015-2020 Strategic outcome-oriented goals

The Department's 2015-2020 Strategic Plan introduced a new vision and mission to articulate what the Government wants to achieve through its investments and efforts in STI. To position STI within the framework of the NDP, 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, coordinated 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.

The Department prioritised the following policy initiatives for the 2017/18 fiscal year:

- Establishment of a Sovereign Innovation Fund
- Expansion of the Sector Innovation Funds
- Review of the Intellectual Property Rights from Publicly Financed Research and Development Act
- Expansion of Hydrogen South Africa Programme
- Finalisation of the Innovation for Inclusive Development Strategy
- Development of a new White Paper on Science, Technology and Innovation (STI) and the finalisation of the Science, Technology and Innovation Institutional Landscape Review (STIIL)
- Completion of 64 MeerKAT antennae commissioned for a single polarisation array.

3. Overview of Budget Vote 30: Science and Technology (2017/18)

The National Budget was tabled amid great concerns around South Africa's growth and investment potential and the crucial need to limit national debt. In light of these fiscal concerns and despite the Department having a huge mandate to fulfil with great expectations for the value that STI will bring to the economy and livelihoods of South Africans; the Department's budget has decreased by R319.7 million in the 2017/18 financial year. For the 2017/18 financial year, the total budget allocation is R7.6 billion. During the 2016/17 financial year the adjusted budget was R7.4 billion. While there has been a nominal increase of 1.7 percent, compared to 201/17, when considering the inflation rate, there is in fact a decrease in the budget allocation of 4.3 percent. Further reductions in particular programmes, salaries and goods and services form part of the effort to lower the public service wage bill and the national expenditure ceiling.

3.1. 2017/18 Budget allocation per Programme

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

Indicator	Programme	Current	Projections		
		2016/17	2017/18	2018/19	2019/20
Number of instruments funded in support of knowledge utilisation per year	Technology Innovation	25	19	21	19
Number of commercial outputs in designated areas per year	Technology Innovation	8	4	3	3
Amount of international funds directly invested in research, science, technology and innovation human capital development programmes, as well as research infrastructure investments in South Africa, accounted for as part of cooperation initiatives implemented by the department, per year	International Cooperation and Resources	R400m	R420m	R440m	R480m
Number of PhD students awarded bursaries, as reflected in National Research Foundation and relevant entities project reports per year	Research, Development and Support	3 136	3100	3 100	3 100
Number of pipeline postgraduate (BTech, honours and masters) students awarded bursaries through programmes managed by the National Research Foundation and relevant entities per year	Research, Development and Support	10 996	10 800	10 800	10 800
Number of researchers awarded research grants through programme managed by the National Research Foundation as reflected in the foundation's project reports per year	Research, Development and Support	4 539	4 500	4 500	4 500
Number of knowledge and innovation products added to the intellectual property portfolio through fully funded or co-funded research initiatives per year	Socio-Economic Innovation Partnerships	35	15	18	20

- 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.

National Treasury has outlined the following selected indicators against which performance will be measured:

Variations in the budget allocation of the medium-term are illustrated in the graph below:

Figure 1: Comparison of budget allocations over the medium-term

While there is a nominal increase in the budget allocations over the financial years following 2016/17, due to inflation the budget actually decreases over the medium-term.

Programme analysis

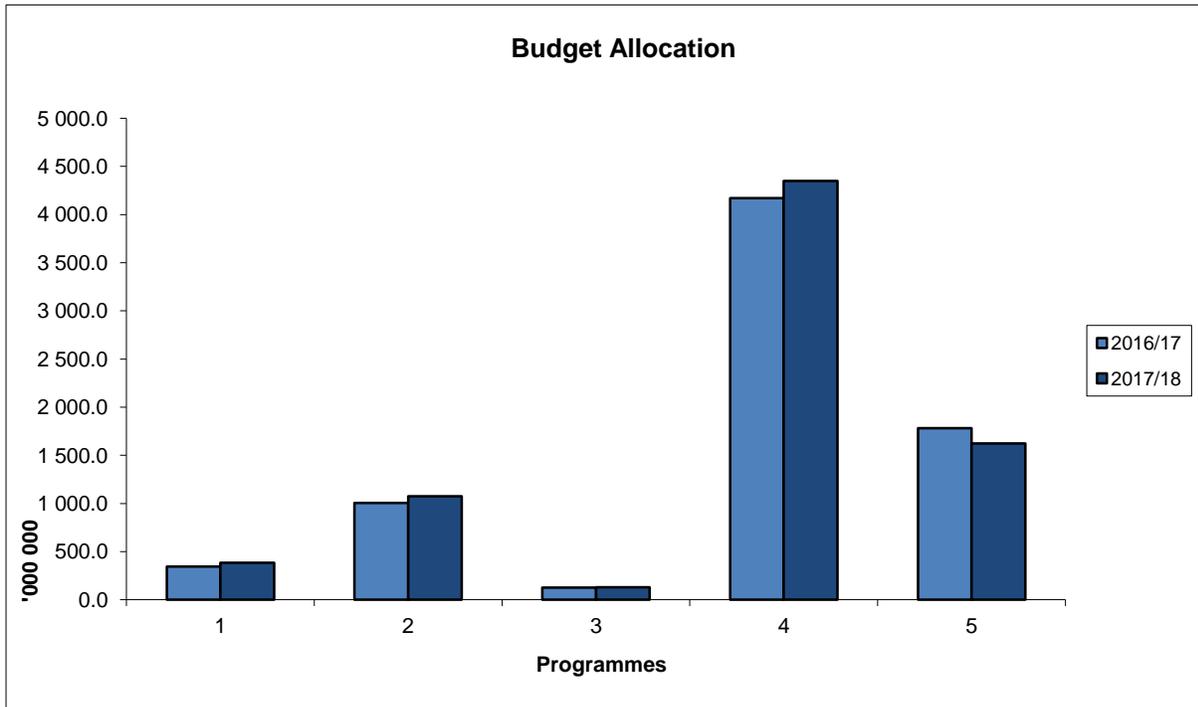
This section will explore budget allocations per programme for the 2017/18 financial year. The table below sets out the budget allocation per programme for the current financial year and compares it to allocations in 2016/17.

Table 1: Change to allocations per programme for 2017/18

Programme	Budget		Nominal Rand change	Real Rand change	Nominal per cent change 2017/18	Real per cent change 2017/18
	2016/17	2017/18	2016/17 – 2017/18		2016/17 – 2017/18	
R million						
1: Administration	345.1	383.7	38.6	15.9	11.2%	4.6%
2: Technology Innovation	1005.4	1073.6	68.2	4.6	6.8%	0.5%
3: International Cooperation and Resources	124.5	128.7	4.2	-3.4	3.4%	-2.8%
4: Research, Development and Support	4171.0	4348.9	177.9	-79.8	4.3%	-1.9%
5: Socio-Economic Innovation Partnerships	1783.0	1622.3	-160.7	-256.8	-9.0%	-14.4%
TOTAL	7429.0	7557.2	128.2	-319.7	1.7%	-4.3%

The following graph is a visual representation of the budget allocations (not adjusted against inflation) tabulated above:

Figure 2: Comparison of budget allocations per programme for 2016/17 and 2017/18 (not inflation-adjusted)



Programme 1: Administration

The programme is responsible for the provision of leadership, management and support services to the Department.

For the 2017/18 financial year, the budget allocation for this programme is R383.7 million. During the previous financial year, the budget was R345.1 million.

Budget allocations for all sub-programmes are tabulated below:

Table 2: Programme 1: Administration

Sub-programme	Budget 2017/18	Percentage of total programme budget
R million		
1: Ministry	4.5	1.2%
2: Management	108.6	28.3%
3: Corporate Services	256.3	66.8%
4: Governance	9.6	2.5%
5: Office Accommodation	4.8	1.3%
TOTAL	383.7	100.0%

Table 3 below reflects how budget allocations per sub-programme has changed between financial years 2016/17 and 2017/18.

Table 3: Change to allocations per sub-programme for Programme 1

Sub-programme	Budget		Nominal per cent change in 2017/18	Real per cent change in 2017/18
	2016/17	2017/18		
R million				
1: Ministry	4.4	4.5	2.3%	-3.8%
2: Management	105.4	108.6	3.0%	-3.1%
3: Corporate Services	221.5	256.3	15.7%	8.9%
4: Governance	9.3	9.6	3.2%	-2.9%
5: Office Accommodation	4.6	4.8	4.4%	-1.8%
TOTAL	345.1	383.7	11.2%	4.6%

Programme 2: Technology Innovation

The purpose of this programme is to enable research and development in space science and technology, energy security and the bioeconomy, and in the merging and converging areas of nanotechnology, robotics, photonics and indigenous knowledge systems, to promote the realisation of commercial products, processes and services. The programme further promotes the protection and utilisation of

intellectual property, technology transfer and technology commercialisation through the implementation of enabling policies and interventions along the entire innovation value chain.

In the 2017/18 financial year, this programme has seen an increase in budget allocation, from R1005.4 million in 2016/17 to R1073.6 million in 2017/18.

The budget allocation for this programme is divided amongst its sub-programmes as follows:

Table 4: Programme 2: Technology Innovation

Sub-programme	Budget 2017/18	Percentage of total programme budget
R million		
1: Space Science	173.4	16.2%
2: Hydrogen and Energy	156.8	14.6%
3: Bioeconomy	156.1	14.5%
4: Innovation Priorities and Instruments	540.5	50.3%
5: National Intellectual Property Management Office	46.8	4.4%
TOTAL	1073.6	100.0%

Table 5 reflects how budget allocations per sub-programme has changed between financial years 2016/17 and 2017/18.

Table 5: Change to allocations per sub-programme for Programme 2

Sub-programme	Budget		Nominal per cent change in 2017/18	Real per cent change in 2017/18
	2016/17	2017/18		
R million				
1: Space Science	166.9	173.4	3.9%	-2.3%
2: Hydrogen and Energy	152.2	156.8	3.0%	-3.1%
3: Bioeconomy	138.1	156.1	13.0%	6.3%
4: Innovation Priorities and Instruments	521.4	540.5	3.7%	-2.5%
5: National Intellectual Property Management Office	26.8	46.8	74.6%	64.3%
TOTAL	1005.4	1073.6	6.8%	0.5%

The National Intellectual Property Management Office (NIPMO) is the implementing office for the IPR Act. In 2016/17 a review of NIPMO and the impact of the IPR Act was undertaken.

The outcome of this review will inform amendments to the IPR Act that will be initiated in 2017/18. The NIPMO sub-programme has received quite a substantial budgetary increase compared to the previous financial year which may be linked to these activities.

Programme 3: International Cooperation and Resources

The purpose of Programme 3 is to strategically develop, promote and manage international partnerships that strengthen the national system of innovation. The programme further enables an exchange of knowledge, capacity and resources between South Africa and its international partners, with a focus on supporting science, technology and innovation capacity building in Africa. The programme also supports foreign policy through science diplomacy.

In the 2017/18 financial year, this programme has seen an increase in budget allocation, from R124.5 million in 2016/17 to R128.7 million in 2017/18.

The budget allocation for this programme is divided amongst its sub-programmes as follows:

Table 6: Programme 3: International Cooperation and Resources

Sub-programme	Budget 2017/2018	Percentage of total programme budget
R million		
1: Multilateral Cooperation and Africa	29.6	23.0%
2: International Resources	59.5	46.2%
3: Overseas Bilateral Cooperation	39.6	30.8%
TOTAL	128.7	100.0%

Table 7 below reflects how budget allocations per sub-programme has changed between financial years 2016/17 and 2017/18.

Table 7: Change to allocations per sub-programme for Programme 3

Sub-programme	Budget		Nominal per cent change in 2017/18	Real per cent change in 2017/18
	2016/17	2017/18		
R million				
1: Multilateral Cooperation and Africa	28.7	29.6	3.1%	-3.0%
2: International Resources	57.5	59.5	3.5%	-2.7%
3: Overseas Bilateral Cooperation	38.3	39.6	3.4%	-2.7%

TOTAL	124.5	128.7	3.4%	-2.8%
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There have been no significant changes in budgetary allocations for each of the sub-programmes.

Programme 4: Research, Development and Support

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

Programme 4 receives the bulk of the total budget, R4.3 billion or 57.6 per cent.

Table 8 provides an overview of the budget allocation per sub-programme.

Table 8: Programme 4: Research, Development and Support

Sub-programme	Budget 2017/18	Percentage of total programme budget
R million		
1: Human Capital and Science Promotions	2424.8	55.8%
2: Science Missions	213.0	4.9%
3: Basic Science and Infrastructure	976.6	22.5%
4: Astronomy	734.5	16.9%
TOTAL	4348.9	100.0%

Table 9 reflects how budget allocations per sub-programme has changed between financial years 2016/17 and 2017/18.

Table 9: Change to allocations per sub-programme for Programme 4

Sub-programme	Budget		Nominal per cent change in 2017/18	Real per cent change in 2017/18
	2016/17	2017/18		
R million				
1: Human Capital and Science Promotions	2357.4	2424.8	2.9%	-3.2%
2: Science Missions	215.5	213.0	-1.2%	-7.0%
3: Basic Science and Infrastructure	906.5	976.6	7.7%	1.4%
4: Astronomy	691.5	734.5	6.2%	-0.1%

TOTAL	4171.0	4348.9	4.3%	-1.9%
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Programme 5: Socio-Economic Innovation Partnerships

The purpose of Programme 5 is to enhance the growth and development priority areas of government through targeted science and technology-based innovations, and the development of strategic partnerships with other government departments, industry, research institutions and communities.

Programme 5 receives the second biggest allocation of the total budget of the Department at R1.6 billion, which is a decrease in allocation compared to the 2016/17 allocation of R1.8 billion

Table 10 provides an overview of the budget allocation per sub-programme.

Table 10: Programme 5: Socio-Economic Innovation and Partnerships

Sub-programme	Budget 2017/18	Percentage of total programme budget
R million		
1: Sector Innovation and Green Economy	982.7	60.6%
2: Innovation for Inclusive Development	256.6	22.0%
3: Science and Technology Investment	25.3	1.6%
4: Technology Localisation, Beneficiation and Advanced Manufacturing	257.8	15.9%
TOTAL	1622.3	100%

Table 11 provides an overview of the budget allocation per sub-programme.

Table 11: Change to allocations per sub-programme for Programme 5

Sub-programme	Budget		Nominal per cent change in 2017/18	Real per cent change in 2017/18
	2016/17	2017/18		
R million				
1: Sector Innovation and Green Economy	932.2	982.7	5.4%	-0.9%
2: Innovation for Inclusive Development	349.5	256.6	2.0%	-4.0%
3: Science and Technology Investment	28.5	25.3	-11.2%	-16.5%

4: Technology Localisation, Beneficiation and Advanced Manufacturing	472.3	257.8	-45.4%	-48.7%
TOTAL	1783.0	1622.3	-9.0%	-14.4%

The biggest budget cut is seen in sub-programme 4: Technology Localisation, Beneficiation and Advanced Manufacturing. The budget has decreased from R472.3 million in 2016/17 to R257.8 million in 2017/18. The budget decrease could impact on the Department's ability to, for example, "provide technology support to a range of small and large firms, and are also aimed at increasing the turnover of small and medium enterprises (SMMEs), and enabling them to secure better contracts with large private-sector companies"

4. Committee Observations

The Committee commended the Department and the entities for the work they do and for formulating coherent strategies and performance plans. In concluding its deliberations on Budget Vote 30: Science and Technology, the Committee noted the following:

- Science, technology and innovation play an important role in improving economic performance and social well-being of all South Africans. To give effect to this, the Department aligns its activities with key policy instruments such as the 1996 White Paper on Science and Technology, the National Development Plan and the Nine-Point Plan that seeks to contribute to creating conditions for radical socio-economic transformation.
- the Nine-Point Plan recognises STI as key to socio-economic growth and it is therefore crucial that STI be placed at the centre of the work of Government. The effectiveness of the NSI can only be realised if optimally resourced and co-ordinated. Therefore, the Committee welcomes the Department's efforts to embark on a process to ensure the development of a coordination instrument to manage effectively and efficiently the RDI public budget.
- The Department and the entities have a mandate to deliver on Government's national priorities, which include areas such as poverty alleviation and unemployment. Hence, the Committee expressed its concern regarding the impact of reduced funding and the below inflation increases of baseline funding to entities.
- Inadequate funding to the Department and its entities effectively means reduction in targets and outputs and ability to grow and fulfil its mandates. It compromises maintaining existing and acquiring new infrastructure and skills.
- Inadequate funding inevitably affects retaining and attracting skilled persons in the STI institutions. The 42 vacancies reported in the Department are of concern as 17 of those vacant posts are considered critical posts. The direct impact of this would be oversight over its entities and the monitoring of departmental programmes and initiatives.
- The entities are constrained by a lack of adequate investment. Its dependency, in some instances, reliant on 70 percent of its income dependent on contract funding, is not sustainable and a further cause for concern. The primary function of researchers become compromised, as they are now required to undertake administrative tasks such as sourcing contracts and preparing tender documents for research funding.
- The current low economic growth trajectory and declining business investment in R&D investment, makes the 2019 target of having 1.5 percent R&D expenditure as a proportion of

GDP not achievable. The Gross Expenditure on R&D is 0.76%. To reach the target of 1.5%, current total expenditure on R&D has to be doubled. Since economic growth will be driven by STI, the Committee would like to see much more robust efforts to increase the gross expenditure on R&D.

- Central to increasing R&D investment, is the role of industry. It is important that industry co-fund, invest and participate in RDI in the strategic sectors of the economy. The Committee urges the Department to improve on effectiveness and instruments to stimulate R&D. The Department should intensify its efforts to increase broader awareness of the R&D tax incentive and ensure that more companies, especially small and medium enterprises, participate.
- The Committee is hopeful that by increased investment in strategic areas of STI, economic benefits are possible. The strengthening of the innovation capacity by forging necessary linkages with all the instruments in the NSI is important. The links between science and industry and its benefits cannot be overemphasized.
- The current forex volatility could negatively affect the activities of the Department and entities since science inflation are higher than standard inflation. A fluctuating exchange rate, could negatively affect the funds spent on activities such as, subscribing to international journals, importing and maintaining specialised equipment, acquiring satellite imagery, and importing scarce skills. The Committee is concerned that this reduces further the budget available for RDI.
- The Committee noted the adjustment of the APP target relating to the MeerKAT telescope dish installation and expressed its understanding that due to the nature of the research process (uncertain outcomes), formulating adequate performance targets has been a challenge for the Department. This uncertainty leads to questions relating to their performance statistics.
- The Committee however urged the Department to explore mechanisms that could measure the impact of its work especially in the areas, which affect basic service delivery.
- The Department should revisit the mandate, role and functions of all its entities to ensure that at those levels, areas of overlap are addressed. It is important that entities cooperate and work together in finding solutions to some of the national challenges in areas of energy, water, waste, etc.
- Intergovernmental collaborative 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 coordinated, not duplicated and resources are not wasted.
- The Committee restates its proposal for a policy, which could give way to a centralised research and development budget as well as monitoring and control mechanism for R&D activities across all government departments. This would ensure efficient allocation and spending on science, technology and innovation across all government departments.
- Enhanced coordination is necessary at Executive as well as Parliamentary level among the various portfolio and select committees in instances where science and technology issues are transversal.

5. 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.
- The Department reports to the Committee on possible measures to resolve the issues around the R&D Tax Incentive Initiative by end-October 2017.
- The Department table, as soon as possible, the 2015/16 and 2016/17, R&D Tax Incentive Programme performance reports. The Committee will schedule a briefing in the following term for this purpose.
- Government investigates formulating a policy that favours State-owned entities and institutions of higher learning, with the required expertise, when tendering for government research contracts that fall within their mandate. The Committee will schedule the necessary briefings to facilitate discussion on this matter.
- The House adopts Budget Vote 30: Science and Technology.

The Democratic Alliance has reserved their right to an opinion on the Vote.

The Economic Freedom Fighters indicated that they would not support the Vote.

Report to be considered