



ANNUAL PERFORMANCE PLAN 2023-2026





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2023-2026

nmisa
National Metrology Institute of South Africa

NMISA provides vital support to industry by ensuring that measurements and standards are accurate, reliable, and traceable, which helps to enhance product quality, improve manufacturing processes, and increase consumer confidence in products and services.

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ABBREVIATIONS AND ACRONYMS

AfCFTA	Africa Continental Free Trade Area
AFRIMETS	Intra-Africa Metrology System
AMD	Applied Metrology Division
APP	Annual Performance Plan
ARI	African Reference Institute
BIPM	International Bureau of Weights and Measures
CC	Consultative Committee
CEO	Chief Executive Officer
CGPM	General Conference on Weights and Measures
CIPM	International Committee for Weights and Measures
CMC	Calibration and Measurement Capabilities
CMM	Chemical, Materials and Medical Metrology
CRM	Certified Reference Material
CSIR	Council for Scientific and Industrial Research
EHS	Environment, Health and Safety
EXCO	Executive Committee
ERP	Enterprise Resource Planning
GDP	Gross Domestic Product
HR	Human Resources
ICASA	Independent Communications Authority of South Africa
ILC	Interlaboratory Comparison
IPP	Independent Power Producer
ISO	International Organization for Standardization
KCDB	Key Comparison Database
KPI	Key Performance Indicator
LED	Light Emitting Diode
MOU	Memorandum of Understanding
MRA	Mutual Recognition Arrangement

NIST	National Institute of Standards and Technology
NMI	National Metrology Institute
NMISA	National Metrology Institute of South Africa
NMS	National Measurement Standards
NRCS	National Regulator for Compulsory Specifications
OH&S	Occupational Health and Safety
PEM	Physical and Electrical Metrology
PFMA	Public Finance Management Act
PPP	Private-Public Partnership
PSD	Particle Size Distribution
PTS	Proficiency Testing Schemes
R&D	Research and Development
RIID	Regional, International Relations and Innovation
SADC	Southern African Development Community
SADCMET	SADC Cooperation in Measurement Traceability
SANAS	South African National Accreditation System
SANS	South African National Standards
SBDG	Strategy, Business Development and Governance
SHEQ	Safety, Health, Environment and Quality
SI	International System of Units
SKA	Square Kilometre Array
SMME	Small, Medium and Micro Enterprises
SOE	State-Owned Enterprises
STEM	Science, Technology, Engineering, Mathematics
TC-QS	Technical Committee for Quality
the dtic	Department of Trade, Industry and Competition
TI	Technical Infrastructure



FOREWORD BY THE MINISTER

Mr Ebrahim Patel

Minister of Trade, Industry and Competition

The 2023/24 Annual Performance Plan of the National Metrology Institute of South Africa (NMISA) reflects the continued efforts of **the dtic** Group to align our activities around a common purpose; grounded in efforts to support Industrialisation to promote jobs and rising incomes, drive Transformation to build an inclusive economy, and build a Capable State to ensure improved impact of public policies.

The APP contains an ambitious set of targets aimed at realising the vision of the NMISA governing legislation, and utilising these regulations to meet their purpose of empowering a larger number of South Africans to contribute towards our shared prosperity. In the year ahead, the NMISA will play a critical role in creating a fair and prosperous South African economy. While companies face a challenging global economic environment, the work of the NMISA will help create the conditions for sustained growth that are most needed when times are hardest.

Since the start of the Sixth Administration, the Department of Trade, Industry and Competition and all entities in **the dtic** Group have begun a process of adopting a revised output-driven planning system, grounded in the objective of combining all our efforts towards creating real impact for South Africans. In 2023/24, **the dtic** concluded this process by introducing 45 output targets, to which the NMISA makes a critical contribution. These include supporting 1 million jobs, mobilising R200 billion in investment, supporting R700 billion in manufacturing exports, and helping Black Industrialists to create 20 000 jobs and R36.8 billion in output. The table on page 64 and 74, sets out the 45 outcomes.

“The APP contains an ambitious set of targets aimed at realising the vision of the NMISA governing legislation, and utilising these regulations to meet their purpose of empowering a larger number of South Africans to contribute towards our shared prosperity.”



While the NMISA has incorporated many of these objectives into the APP, our next steps will be to further align the work of NMISA to meet these common objectives through the implementation of its governing legislation. Within one month of tabling this version of the plan, proposed revisions must be submitted to the Executive Authority to better align with the vision of these targets.

Implementation of this plan must take account of the challenging fiscal environment in which government is operating, and as such I have instructed all entities to undertake a further review of their spending plans for the period of the plan, and to submit a final, revised financial plan within one month of tabling this version of the plan. This plan should aim to reduce unnecessary spending, and redirect these resources to better serve our core objectives.

The APP 2023/24, is hereby submitted in accordance with the Revised Framework on Strategic and Annual Performance Plans.

Mr Ebrahim Patel

Minister of Trade, Industry and Competition

Date: 31 March 2023



FOREWORD BY THE CHAIRPERSON

Ms Lindie Lankalebalelo
Acting Chairperson

NMISA was established and is fulfilling its legal mandate under the Measurement Units and Measurement Standards Act, Act No. 18 of 2006.

- To provide for the use of measurement units of the International System of Units (SI).
- To designate other measurement units for use and to provide for the designation of the National Measurement Standards (NMS), and to develop, keep, maintain, and disseminate the NMS (reference measurements, reference standards and reference materials).

The following strategic goals formulated in 2019 have not changed and are aligned with the 3 outcomes that **the dtic** is championing to build a capable state and to strengthen the quality infrastructure.

- Metrology for regulatory purposes and in support of government laboratories: for compliance and for development of regulations.
- Metrology consolidation for SOEs to provide efficient shared services.
- Metrology for industry including assistance to small, medium and micro enterprises (SMMEs) to provide appropriate services in support of manufacturing, beneficiation, and export.
- Strategic alignment with the legal metrology function in the country, to enhance the application of advanced scientific and applied metrology to support the implementation of the Legal Metrology Act.

“ Amid the reduction in its capital budget, NMISA endeavoured to find innovative ways to create additional value for our stakeholders to enhance financial sustainability. ”



The NMISA Board has led the organisation to achieving its five-year plans developed for 2019–2024, amidst challenges that included the negative impact of the Covid-19 pandemic and resulting national and international lockdowns. The pandemic had a consequence of slowing down the implementation of some of the programmes that were focused on enhancing medium to long term sustainability.

The pandemic also led to a delay in the project for the review of the quality infrastructure to set a platform for the inclusion of the requirement for embedding the need for demonstrating accuracy of measurement results through traceability to the National Measurement Standards of South Africa into most regulations in South Africa.

As we implement the final year of the strategic plan 2019–2024 NMISA is faced with the challenge of a reduction in the capital budget, and this will affect and delay the conclusion of key programs and projects that have been initiated. The main projects that will be affected is the implementation of the Applied Metrology unit whose main focus is to enhance the stakeholder and client focus with the intention to increase impact. Amid the reduction in its capital budget, NMISA endeavoured to find innovative ways to create additional value for our stakeholders to enhance financial sustainability.

During the financial year the terms of office of the current Board of Directors and the current CEO will also come to an end. The board is looking forward to supporting **the dtic** in realising its goals through measurement excellence.

Ms Lindie Lankalebalelo

Acting Chairperson



EXECUTIVE SUMMARY BY THE CEO

Dr Wynand Louw

Acting Accounting Officer

The NMISA has been focused in recent years on enhancing the measurement capability in line with **the dtic** intention to build a capable state. The recapitalisation funding received over the past few years have been very useful in successfully modernising the National Measurement Standards (NMS), developing the associated human capital with skills required by the increasing stringent requirements for accurate measurements. The rapid technological advances and the associated development in the metrology world present a risk that metrology institutes in developing countries may be left behind. This has a knock-on effect on localisation and setting up industries that are sustainable and therefore affecting trade.

Through the recapitalisation project, the NMISA has been positioning itself to support trade and exports with measurement solutions that are key to enhancing competitiveness of South African products and ensuring the much-needed product safety. The project set out to equip the organisation with modern instruments and the upskilling of human capital, for NMISA to respond to measurement challenges with measurement solutions.

Central to the role that NMISA plays is the support of regulators with measurement standards and solutions. Although mutual acceptance of measurement results forms the basis of all trade, there has been a gap in the embedding of traceability to the National Measurement Standards provided by NMISA into other Acts and Regulations. To tackle this, NMISA set strategic goals to consolidate metrology

services for regulators, government laboratories, and SoEs, as well as an enhanced strategic alignment with the legal metrology function in the country. The need to revise the Measurement Units and Measurement Standards Act remains critical to the achievement of these strategic objectives and the meeting of the NMISA mandate. Also important is the harmonisation of the quality infrastructure to provide quality assurance across all industries.

To improve the efficiency of regulation, NMISA has over the years forged relationships with several government departments and state-owned entities to support their activities with fit-for-purpose measurement solutions.

“NMISA provides the link to the international system of measurement units needed for trading both within AfCFTA and internationally. The principle applies “measured once, accepted everywhere”.”



The Technical (quality) Infrastructure enables South Africa to compete in the global economy: NMISA provides the link to the international system of measurement units needed for trading both within AfCFTA and internationally. The principle applies “measured once, accepted everywhere”.

Without a metrology institute in South Africa, measurement traceability to reference standards would have to be sourced from other countries or continents that realise primary measurement units. The expense of sourcing traceability to the international system of units can be measured in both rands and time as well as lost opportunities. Visibility and an awareness of the NMISA is key for the institute to ensure that its reach expands to service the needs of additional government departments, regulators and industries within South Africa and on the African continent.

The NMISA’s goals are aligned with reducing red tape, integration, and consolidation of metrological services. NMISA, working together with the other 3 technical infrastructure entities, collectively presents South Africa with quality assurance solutions that protect South African markets and enable growth of the South African economy. As NMISA moves closer and closer to achieving the targets set out in 2019, it has become evident that a modern national metrology institute impacts all areas of economic activity and plays an important role in social and economic growth.

The APP 2023–2026 will continue the focus on the implementation of the Applied Metrology division to continue with the customer centric focus the organisation has been driving. I am looking forward to an increase in the impact to the economy and enhanced coordination with other technical infrastructure entities because of the implementation of the NMISA programs.

Dr Wynand Louw
Acting Accounting Officer

OFFICIAL SIGN-OFF

It is hereby certified that this Annual Performance Plan:

- Was developed by the management of NMISA under the guidance of the Board and the Board Chair, Ms J Mogadime who has since resigned from the NMISA board;
- Takes into account all the relevant policies, legislation, and other mandates for which NMISA is responsible; and
- Accurately reflects the impact, outcomes, and outputs that NMISA will endeavour to achieve given the resources made available in the budget for 2023/24–2025/26.



Dr Jayne de Vos

Director Applied Metrology Division



Ms Natasha van der Walt

Director Strategy, Business Development and Governance Division



Mr Teboho Mthombeni

Director Corporate Services



Mr Mogau Sehlapelo

Chief Financial Officer



Dr Wynand Louw

Director Regional, International Relations and Innovation Division



Dr Wynand Louw

Acting Accounting Officer



Mr Benjamin van der Merwe

Director Physical and Electrical Metrology



Ms Lindie Lankalebalelo

Acting Chairperson

Approved by:



Dr Jeseelan Pillay

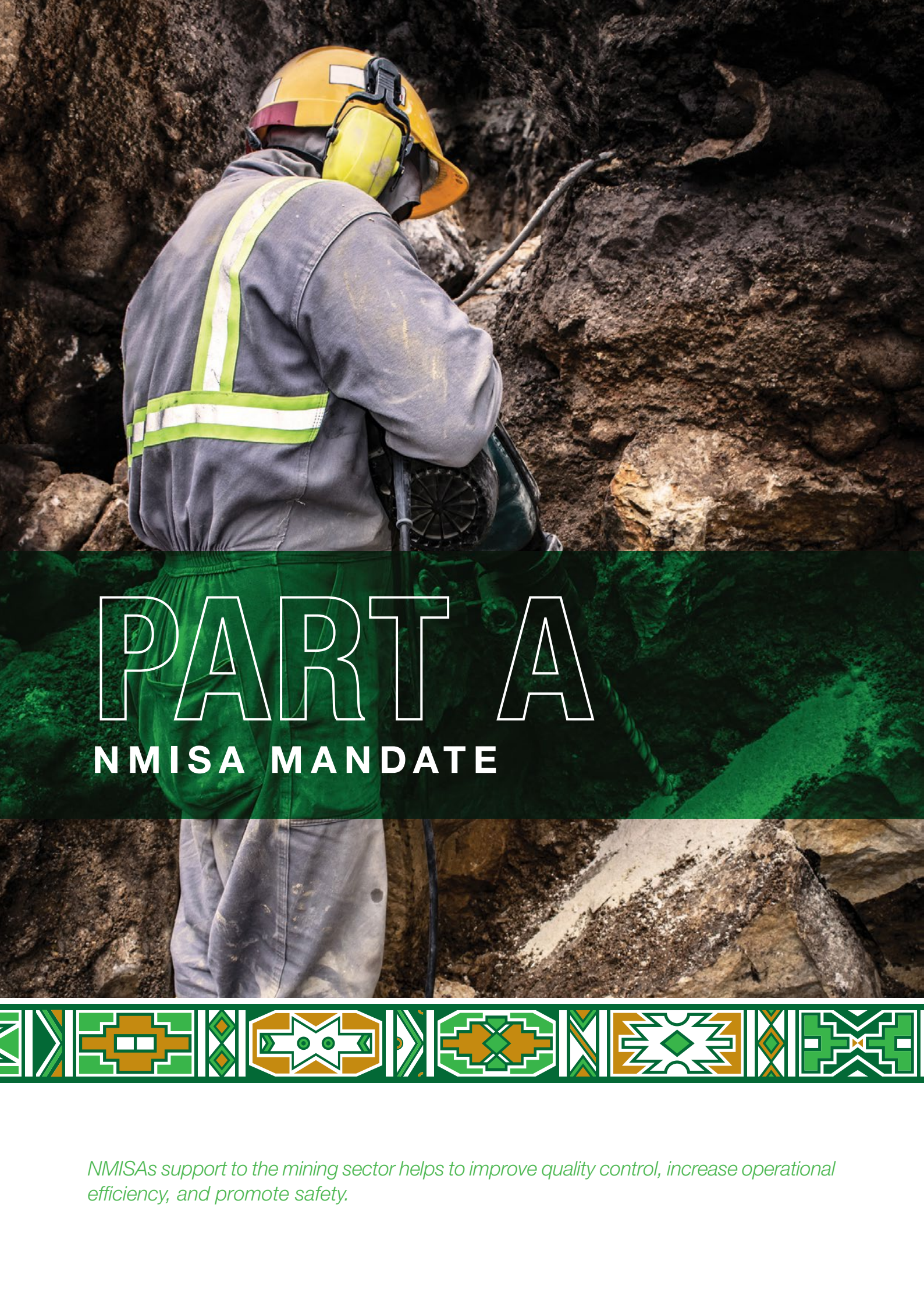
Director Chemical, Material and Medical Metrology Division

Mr Ebrahim Patel

Executive Authority



NMISA supports the automotive industry by providing accurate and reliable measurement solutions, calibration services, and proficiency testing to ensure compliance with local and international standards and regulations. Accurate measurements are crucial in the automotive industry for quality control, safety, environmental compliance, and the competitiveness of the industry.



PART A

NMISA MANDATE



NMISAs support to the mining sector helps to improve quality control, increase operational efficiency, and promote safety.

A1 OUR MANDATE

NMISA was established and is fulfilling its legal mandate under the Measurement Units and Measurement Standards Act, Act No. 18 of 2006.

- To provide for the use of measurement units of the International System of Units (SI).
- To designate other measurement units for use and to provide for the designation of the National Measurement Standards (NMS), and to develop, keep, maintain, and disseminate the NMS (reference measurements, reference standards and reference materials).

A2 VISION

To be the leading metrology and measurement centre of excellence on the African continent connecting Africa to the world.

A3 MISSION

To consistently deliver outstanding innovative and internationally comparable measurement solutions that support regional and international trade, people's quality of life, and enable the protection of the environment.

A4 VALUES

QUALITY

We strive for quality in all that we do, while upholding our role as the highest measurement authority in South Africa.

MEASUREMENT EXCELLENCE

We offer advanced measurement accuracy to promote economic growth.

SOCIAL RESPONSIBILITY

We provide measurement solutions that are safe, secure, sustainable, through the protection of the environment and people.

PEOPLE FOCUS

We promote integrity, high ethical standards, accountability, transparency, responsiveness, and inclusivity.

A5 UPDATES TO THE RELEVANT LEGISLATIVE AND POLICY MANDATES

The International System of Units (SI) is continuously improved, and the latest revision of the SI came into effect on 20 May 2019, World Metrology Day. In accordance with the Measurement Units and National Measurement Standards Act, new updates are gazetted. NMISA is responsible for maintaining the measurement units in accordance with the revised SI and ensuring that all international developments in units are appropriately legislated.

the dtic has initiated a revision of the Measurement Act to align it with the latest international and local best practice. The main aspects to be addressed include: the role of NMISA in providing measurement services and traceability to government departments; measurement facilities (police forensics, Department of Health forensic laboratories, Department of Transport law enforcement agencies, etc.); the provision of metrology shared services to state-owned enterprises (SOEs) for better alignment with the Legal Metrology Act.

A5.1 APPLICABLE ACTS

Table 1: Acts relevant to NMISA

ACT	PURPOSE
Measurement Units and Measurement Standards Act (Act No. 18 of 2006)	To provide for the use of measurement units of the SI and certain other measurements units; to provide for the designation of national measurement units and standards; to provide for the keeping and maintenance of NMS and units; to provide for the establishment and functions of the National Metrology Institute; to provide for the repeal of certain laws; and to provide for matters connected therewith.
Legal Metrology Act, (Act No. 9 of 2014)	The Legal Metrology Act provides for the administration and maintenance of legal metrology technical regulations to promote fair trade, for public health and safety, the protection of the environment and to provide for matters connected therewith. NMISA has extensive metrology laboratories, standards, and equipment, together with a solid base of scientific metrology skills, knowledge, and capacity to support legal metrology in health, safety, and environment measurements.
Public Finance Management Act (PFMA), (Act No.1 of 1999 as amended)	To regulate financial management in the national government and provincial governments; to ensure that all revenue, expenditure, assets and liabilities of those governments are managed efficiently and effectively; to provide for the responsibilities of persons entrusted with financial management in those governments; and to provide for matters connected therewith. NMISA is an extension to government and therefore prescribes to the PFMA.
The Disaster Management Act, (Act No. 57 of 2002)	Since the outbreak of the COVID-19 pandemic in South Africa, NMISA re-prioritised its technical projects to allocate resources to projects on ultraviolet germicidal disinfection studies, guidance on accurate infrared temperature screening for COVID-19, reference mixtures for medical gasses, chemical analysis of sanitiser liquids and gels, and the calibration of ventilators. These measurement service offerings enable local manufacturers to meet product specifications and quality standards to reduce dependence on international supply. The pandemic has highlighted the importance of a quality infrastructure and the need for reliable metrology services.
Hazardous substances Act, (Act No. 15 of 1973), Regulation No. R. 247, 26 February 1993	NMISA provides measurement traceability and calibration of equipment used for monitoring of ionising radiation.
The Civil Aviation Act, (Act No. 13 of 2009)	NMISA provides measurement traceability contributing to safety and security throughout the civil aviation industry as well as measurement training courses for aviation technicians.
The Foodstuffs, Cosmetics and Disinfectant Act, (Act No. 54 of 1972 as amended)	NMISA value assigns elements in food matrices and provides proficiency testing schemes (PTS) in support of food labelling as required and published by the Department of Health regulations relating to the labelling and advertising of foodstuffs.

ACT	PURPOSE
Independent Communications Authority of South Africa Amendment Act, (Act No. 2 of 2014)	The introduction of remote working arrangements to minimise physical contact between people while the COVID-19 pandemic is prevalent, has increased the demand for stable and reliable mobile data services at an affordable cost. Those employees, students and learners who have ready access to mobile data in sufficient quantities to support their work or learning activities, have a distinct advantage over those that do not. NMISA has signed a memorandum of understanding (MoU) with the Independent Communications Authority of South Africa (ICASA) to establish a joint project to investigate and develop a verifiable mobile data measurement solution to enable independent end user verification of the accuracy of mobile data usage statements.
National Road Traffic Act, (Act No. 93 of 1996)	NMISA supports Section 59 of the Act in that it offers speed measurement calibrations including calibration to the new specification.
Air Quality Act, (Act No. 39 of 2004)	NMISA supports the Act through the provision of reference gas mixtures for air pollution and environmental monitoring.
Road Traffic Management Corporation Act, (Act No. 20 of 1999)	The Act is supported through the calibration of breathalysers for law enforcement.
Occupational Health and Safety Act, (Act No. 85 of 1993 – regulations)	The Act is supported through calibration of noise, illuminance, and air monitoring devices.

A5.2 LEGISLATIVE FRAMEWORK

Table 2: The legislative framework applicable to NMISA as a schedule 3A entity

FRAMEWORK	PURPOSE
King Code	Provides a benchmark of best practices and accountability standards for organisations.
Frameworks for Managing Programme Performance Information	Sets out the planning processes as mandated in Section 215 and 216 of the Constitution of South Africa; Strategic plans and Annual Performance Plans.
National Treasury Regulations	Provide guidance to NMISA on matters of compliance and good governance in an evolving economy.
ISO 45001: 2018	Requires calibration of measurement and monitoring equipment used by accredited approved inspection authorities to evaluate organisational health and safety performance in the workplaces.
ISO 14001: 2015	The use of calibrated measuring equipment for measuring key characteristics of operations that can have significant environmental impact.

A5.3 UPDATES TO THE RELEVANT COURT RULINGS

The court ruling pertaining to speed measuring devices highlights the importance of being traceable to the National Measurement Standard and the required input from NMISA that has a significant impact on service delivery for traffic law enforcement.

The recent court case relating to speed camera prosecution was the case in the Free State, the case of the State vs Zaheer Khan. Mr Zaheer Khan was accused of driving at a speed of 171 km/h, the state could not prove its case beyond reasonable doubt. This was mainly due to the sealing of the speed camera after calibration and the type-approval of the speed camera.

The City of Tshwane and the City of Joburg have recently also faced challenges regarding the type-approval of speed cameras. This has resulted in lost revenue for the metros due to similar issues that were raised in the case of the State vs Zaheer Khan.

A5.4 UPDATES TO INSTITUTIONAL POLICIES AND STRATEGIES

The Strategy of NMISA was reconsidered and updated in 2018/19 to reflect the international, regional, and national situation, as published in the Strategic Plan 2019–2024. The strategic goals are outlined in the following section.



PART B

NMISA STRATEGIC FOCUS



NMISA ensures that food quality and safety standards are maintained throughout the food supply chain, which helps to safeguard public health and promote sustainable agriculture practices.

B1 UPDATED SITUATIONAL ANALYSIS

Internationally and regionally, the pandemic had a severe impact on the processes to compare the NMS realised and maintained by the various national metrology institutes (NMIs). However, with practical arrangements implemented by the International Bureau of Weights and Measures (BIPM), NMISA was able to maintain its NMS and continued to demonstrate international equivalence of its standards. Also, NMISA continued to provide measurement services to several African NMIs, especially within the SADC region. Locally, NMISA's revenue generated from sales of measurement products and services, was impacted by the aftermath of the pandemic. In response, NMISA enhanced efforts to expand on diversifying its service offerings and to enhance service delivery through a client-centric approach.

Through its Africa Reference Institute (ARI), NMISA is ideally positioned to support the goals of AfCFTA, and other trade agreements such as AGOA and BRICS – as trade agreements rely substantially on internationally accepted measurement units and standards. The design of the ARI was initiated during the recapitalisation project. The Institute spent the last nine years upgrading its measurement capabilities, including its human capital, to ensure that it can provide the national measurement infrastructure required to support industrialisation and localisation. The upgrades positioned NMISA to make key contributions to initiatives aimed at enhancing quality assurance of products and services on the African continent, and to become less dependent on imports from developed economies. The improved measurement capabilities also enabled NMISA to expand its measurement service offerings to support national priorities, including energy saving, climate change and geo-political objectives, and technology development and implementation. Accordingly, NMISA programmes have been set up to support **the dtic** initiatives for creating a transformed, capable state to progress the economy.

The Technical Infrastructure entities collectively play a vital role in quality assurance and international acceptance of locally produced products. Metrology specifically plays a key role in enabling effective functioning of laws and regulations. It provides the scientific foundation for measurement methods and traceable results applied in traffic law enforcement, such as breath and blood alcohol testing, speed measurement,

and load testing of heavy vehicles. Effective regulation requires that metrology aspects be addressed within the terms of the regulation. The measurement solutions provided by NMISA can assist SOEs with improved service delivery and increased efforts are being made to make these services available to districts outside the five main metropolitan areas as well as within the designated Special Economic Zones.

The strategic goals of the organisation remain as outlined below. Briefly, there is a strong focus to consolidate metrology among SOEs and provide support to government laboratories. Also, structural transformation of the economy is considered a key priority by the organisation. Thus, the provision of metrological services to assist small, medium and micro enterprises (SMMEs), notably black-owned businesses, in support of manufacturing, beneficiation and export, is critical to NMISA's strategy.

- Strategic goal 1:** Metrology for regulatory purposes and in support of government laboratories for compliance and for development of regulations.
- Strategic goal 2:** Metrology consolidation for SOEs to provide efficient shared services.
- Strategic goal 3:** Metrology for industry including assistance to SMMEs to provide appropriate services in support of manufacturing, beneficiation, and export.
- Strategic goal 4:** Strategic alignment with the legal metrology function in the country to enhance the application of advanced scientific and applied metrology to support the implementation of the Legal Metrology Act.

The strategic goals are complemented by NMISA's matrix structure, with the approach to strategically link these goals with functional areas.

B2 ORGANISATIONAL STRUCTURE

NMISA is a Schedule 3A public entity, managed by a chief executive officer (CEO), supported by an executive management team, and governed by the NMISA Board. The organisational structure comprises the governance structure depicted in **Figure 1** and the functional structure shown in **Figure 2**. While the structure is represented in a traditional format, the organisation operates in a matrix system. This enables an enhanced customer-centric approach through cross-functional activity, integration of functional excellence and a focus on shared learning between projects and thematic research and development (R&D) programmes.

The structure is further designed to optimise service delivery to the end user through a dedicated division, Applied Metrology (dissemination of the NMS to industry), which obtains its knowledge sources from the two divisions dedicated to *scientific metrology* (realisation of the NMS, development of reference materials and providing reference measurements); Chemical, Materials and Medical Metrology (CMM); and Physical and Electrical Metrology (PEM).

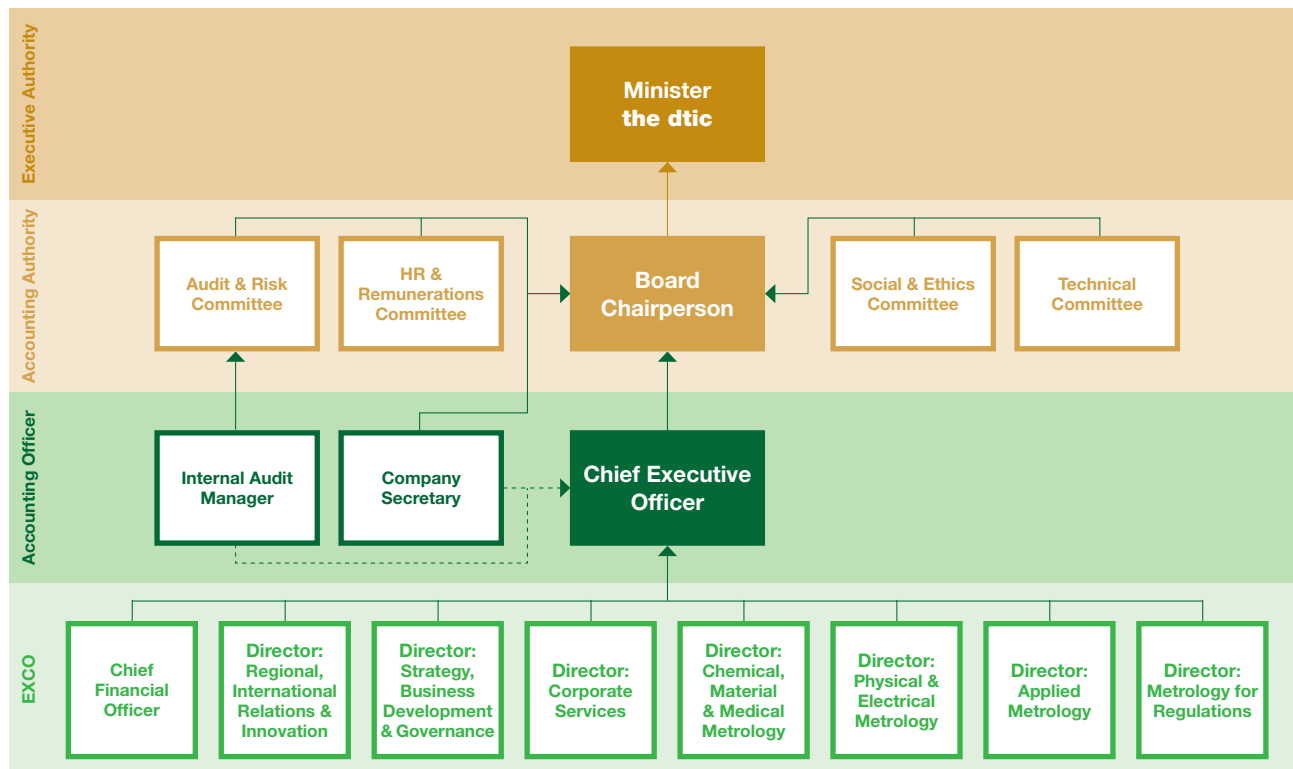


Figure 1: Governance Structure showing Accounting Authority

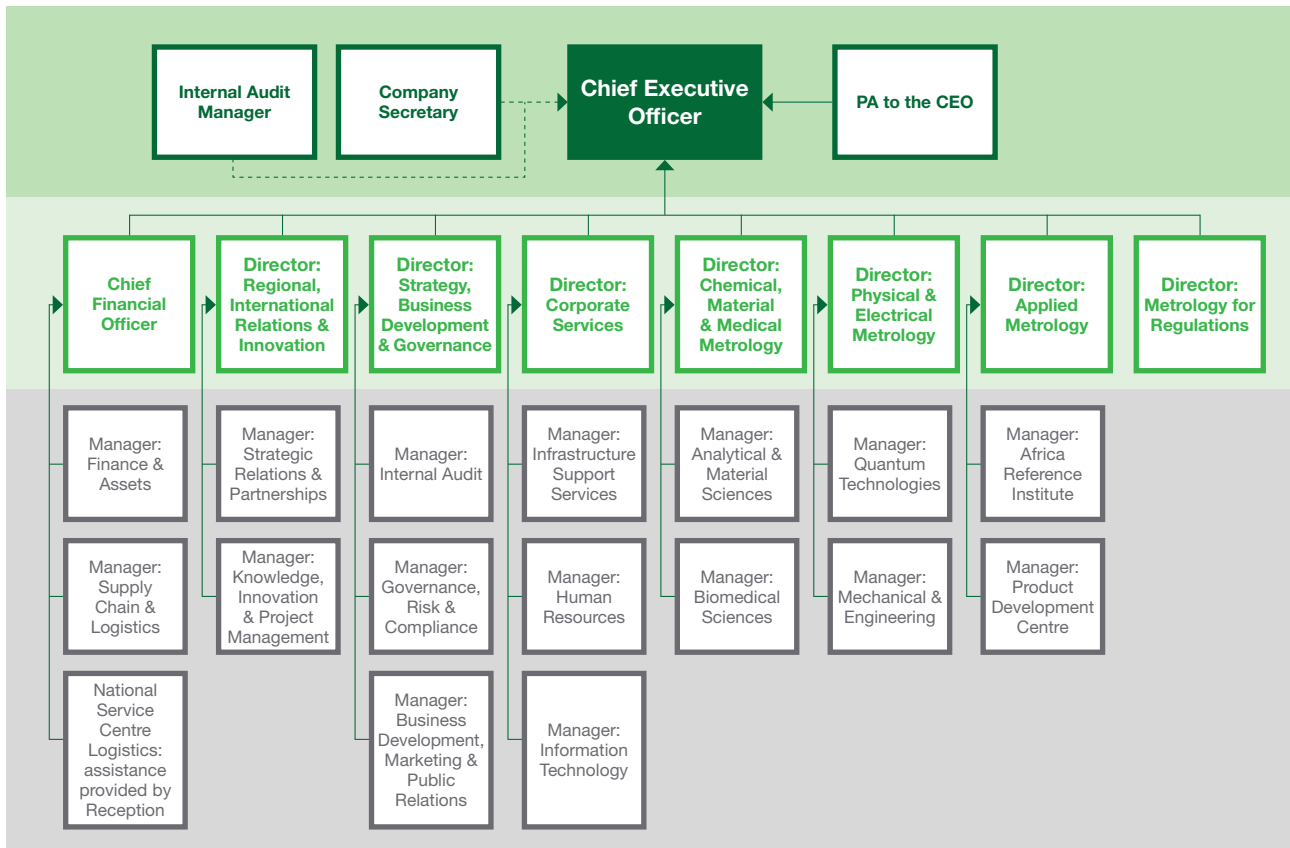


Figure 2: Functional Structure showing NMISA Management

B3 PERFORMANCE DELIVERY ENVIRONMENT (EXTERNAL)

Within the organisational environment, scientific research into maintenance and development of NMS is captured in thematic programmes that form the basis of the matrix system deployed in the organisation. This allows for easily adapting to environmental changes, integration of functional expertise, resource sharing and lateral communication. NMISA performs the R&D activities to deliver outcomes such as new and improved NMS or measurement methods, new certified reference materials and novel measurement solutions to industry. Operational processes within the programmes, and across the organisation, are governed by the quality management system to ensure organisational effectiveness.

B3.1 ORGANISATIONAL EFFECTIVENESS

Resources from functional units within the organisation are utilised across R&D thematic programmes, where

the development and improvement of the NMS, and the development of new products and services such as certified reference materials and reference measurements, are conducted. Realisation and maintenance of the NMS are performed by the functional units.

Products and services are planned in the applied focus areas, based on R&D performed in the thematic programmes. As these products and services mature, they are managed through the dedicated centres in the Applied Metrology Division and expanded through business development activities. The focus areas of applied metrology consider solution-based, routine services to the local economy. An overview of the functional units, R&D thematic programmes and focus areas, are shown in Table 3 that follows.

Table 3: An overview of the focus areas within the R&D thematic programmes, supported by functional units

FUNCTIONAL UNITS	R&D THEMATIC PROGRAMMES	FOCUS AREA
PEM (Quantum Technologies and Mechanical & Engineering)	Manufacturing Competitiveness	Materials science and services
	Reference Materials	Agriculture, food and feed safety and food labelling
CMM (Analytical & Material Sciences and Bio-Medical Sciences)	Green Economies	Environmental monitoring and waste management
	Quality of Life	Health and safety
		Law enforcement
RIID (Metre Convention Affairs, Strategic Relations & Partnerships and Knowledge Innovation & Project Management)	Advanced Measurement Solutions	Digital economy
	Energy Efficiency	Energy efficiency
	Redefinition of the SI	Innovative projects

The Regional, International Relations and Innovation Division (RIID) ensures that NMISA is appropriately linked to the regional and international metrology community, fosters collaboration with other NMIs, and sources funding from development partners. Collaborative efforts feed into the R&D thematic programmes via the RIID. The division also manages strategic partnerships with the sub-regional (SADCMET) and regional (AFRIMETS) metrology organisations.

The Strategy, Business Development and Governance (SBDG) Division coordinates the implementation of the NMISA strategy plan, guides new business development, monitors client service and satisfaction, maintains service relationships with key clients, gathers market intelligence and coordinates marketing and sales. The technical activities are further guided and supported by the Finance and Corporate Services Divisions.

B3.2 QUALITY INFRASTRUCTURE

NMISA adheres to a total quality management system managed by the Safety, Health, Environment and Quality (SHEQ) office. This office coordinates all matters relating to accreditation of technical competencies, health and safety of staff, and the environment. A total of 20 laboratories are accredited to ISO/IEC 17025:2017 by the South African National Accreditation System (SANAS). In addition, two

laboratories are accredited against ISO 17034 to produce certified reference materials. Accreditation to ISO/IEC 17043 (for conducting PTS) has been attained for those laboratories providing PTS. NMISA organic chemical purity assignment services are internationally peer reviewed by AFRIMETS TC-QS through National Institute of Standards and Technology (NIST) technical experts. NMISA has further achieved certification of its occupational health and safety (OH&S) management system and its environmental management system (EMS), guided by ISO 14001 and ISO 45001.

NMISA maintains more than 530 calibration and measurement capabilities (CMCs) published in the international Key Comparison Database (KCDB – BIPM Appendix C). The CMCs have been accepted internationally through a peer-review process, which includes SANAS accreditation of those parameters as a prerequisite. Over 90 % of NMISA's services are linked to the CMCs, and thus are internationally accepted. This database of all internationally recognised measurement capabilities can be accessed at: www.bipm.org/kcdb/.

Scientists and engineers from NMISA act as technical assessors for competence assessments of local and regional laboratories as part of their accreditation processes.

B4 ORGANISATIONAL DELIVERY ENVIRONMENT (INTERNAL)

The trade of goods and services around the world is crucial not only to the global economy but also to domestic economic growth, productivity, and investment opportunities. For customers to consider trade to be fair and benefit from it, measurements taken in different parts of the world must be accurate, equivalent to each other, and accepted by each country. Important decisions (economic, environmental, social, and medical) are based on measurement results.

B4.1 THE NATIONAL MANDATE

NMISA has a very specific role in this context: without a measurement infrastructure it is difficult for the country to manufacture to local and international specifications and tolerances, and to ensure the integrity of commodities, locally and for the export market. Competitive manufacturing relies on accurate, internationally comparable measurement that is achieved through the establishment of 'traceability' of the measurement result to the SI or internationally agreed references. This local capability enables trade, component manufacturing, legal acceptance of measurement results for law enforcement, reliable measurement data for environmental monitoring, food safety, improved medical diagnosis and treatments through accurate measurement, and consumer protection.

NMISA has aligned its activities to the Re-imagined Industrial Strategy of the sixth administration as implemented through the different sector master plans. With the international measurement equivalence focus, NMISA focuses on supporting the goal of **the dtic** in building mutually beneficial regional and global relations to advance South Africa's trade, industrial policy, economic development, and building the state's capacity. NMISA has also aligned its activities with government's Economic Reconstruction and Recovery Plan, as well as with the District Development Model to assist the government in improving inclusion. NMISA contributes to these national priority programmes through the focus areas mentioned in Table 3 on page 22.

B4.2 ADVANCED MEASUREMENT CAPABILITIES

Through its recapitalisation programme (Section C8), NMISA increased its scope of measurement capabilities to include measurement services for new and rapidly developing technologies, such as nanotechnology, optical techniques, quantum-based technologies and material sciences, among others. Service offerings through the utilisation of these technologies are dependent on the development of new measurement methods and measurement standards. This positioned NMISA to offer a comprehensive suite of specialised, consolidated measurement services. In the case of local automotive manufacturers, the suite of services includes surface analysis of materials, high-accuracy dimensional measurements on components within small tolerances, compliance to regulations for automotive gas emissions, internal fibre optic communication networks, optical, thermal and electrical properties of materials, to mention but a few.

In the absence of a local measurement infrastructure that is internationally recognised and accepted, local (automotive) manufacturers must import measurement traceability from their original equipment manufacturers at additional cost and time delays. A country without appropriate metrology infrastructure would not be an attractive investment option for multinational manufacturing companies. By investing in the local metrology infrastructure, **the dtic** did not only establish the measurement systems and associated laboratory infrastructure, but also invested in the development of the scientific skills needed in young professionals locally to provide and sustain the service.

Similarly, consolidated measurement services have been defined for all the key economic sectors, specifically for mining, environmental monitoring, energy efficiency, agriculture and food production, health (medical), law enforcement, and telecommunications (digital economy). The impact of and need for these services are already evident in the increased uptake of NMISA products and services and the associated increase in external revenue over the past few years (taking the economic impact of the pandemic over two years since 2020/21 into consideration).

B4.3 INTERNATIONAL AND REGIONAL PARTICIPATION

Regionally, NMISA is the main provider of traceability to the SI for sub-Saharan Africa. In response to the AfCFTA, NMISA is developing measurement capabilities that would be required nationally and for Africa in a custom-free trade area. As NMISA rolls out these diversified services to new markets and expands in existing markets, the ARI serves as a hub for offering measurement solutions and services to stakeholders on the African continent. Local and uniquely African products and services that are demonstrated to be internationally equivalent, eliminate the need for importing substitute products from overseas, thereby enhancing the continent's self-sustainable development.

In collaboration with **the dtic**, NMISA ensures that the interests of South Africa, SADC and Africa are advanced at the BIPM – the intergovernmental organisation responsible for providing the basis for a single, coherent system of measurements throughout the world – under the supervision of the International Committee for Weights and Measures (CIPM), itself under the authority of the highest international decision-making body in metrology, the International Conference on Weights and Measures (CGPM).

The CIPM has established ten Consultative Committees (CCs) to oversee and arrange for regular international comparison of the NMS realised by its member countries. The CCs bring together the world's best scientists in their specified fields as advisers on scientific and technical matters and directs the technical programmes at the headquarters. NMISA holds full membership of nine of the ten CCs (membership is bestowed based on the primary realisation of the units of the SI and continued technical competency).

NMISA holds the Presidency of the CIPM since 2018 and has been re-elected to the CIPM at the most recent CGPM (November 2022). Through the Presidency, NMISA has guest membership of the tenth CC, the Consultative Committee for Units.

As the only NMI in Africa with membership of all the CCs, NMISA provides the link to the international measurement system for Africa and plays a leading role in the development of the metrology infrastructure in Africa, especially in support of South Africa's immediate neighbours in SADC. This is crucial for successful implementation of regional and continental free-trade agreements. This role is emphasised in **the dtic's** strategic goals and South Africa's contribution towards mutual acceptance of measurement and testing results in the region (regional integration).

B4.4 SKILLS DEVELOPMENT IN STEM FIELDS RELATED TO MEASUREMENT SCIENCE

Training and technical skills development of young scientists remains a critical need since metrology skills are not readily available in the job market, especially among young black professionals. An integrated training and development plan has been drafted to assist each measurement scientist, whether experienced or new in the field, in improving his or her skills and to establish a pipeline of young scientists specialising in measurement science through the bursary programme, onsite training in metrology, and internships. These young professionals are provided with skills suited to the industry and, where possible, are appointed permanently.

B5 STAKEHOLDER ANALYSIS

As one of **the dtic**'s Technical Infrastructure (TI) entities, the activities of NMISA are critical to the success of the other TIs. The combined functions of metrology, standardisation and regulation, conformity assessment, and accreditation provide for quality assurance of products and services used by local consumers. As such, an effective TI is a key requirement for effective free-trade agreements between countries or economic trading blocks and feeds into the interaction with the other stakeholders. A summary of the shareholder and stakeholder interactions follows.

Table 4: Summary of NMISA shareholder and stakeholder interactions

STAKEHOLDERS	ATTRIBUTES	INFLUENCE	INTEREST	LINKAGES WITH OTHER STAKEHOLDERS
National Government	Contributing agency to the implementation of the National Development Plan. Trade agreement negotiation (including AfCFTA) Contributing to drafting and implementing regulatory policies and frameworks	High	High	Key player in legislative and regulatory environment
the dtic	Shareholder	High	High	Provide input in terms of master plans and economic recovery
NMISA Board of Directors	Independent control oversight body	High	High	Control and oversight
Consultative Forum	Independent advisory body	High	High	Consultative advisory body
The BIPM	Acts in matters of world metrology	High	High	Concerned with measurement standards and the demonstration of equivalence between national measurement standards
Experts (local and international)	Provide expertise in the field of metrology	High	High	Metrology matter experts
Academia	Key producers of knowledge, research, new skills, and capabilities	Low	High	Collaborations for generation of knowledge and dissemination of the curriculum on the revised SI
AGSA/external auditors	Tasked with the responsibility of oversight accountability and governance	High	High	Audit for compliance with legislation
Clients	Inform NMISA of the development and maintenance of the NMS for purposes of trade; contributes to the sustainability of NMISA Obtain measurement services from NMISA to enhance their ability to compete in local and export markets	High	High	Quality infrastructure through the provision of measurement traceability to support trade (imports and exports) the dtic output targets for a capable South Africa
Suppliers	Enterprise development and contribution to NMISA Black Economic Empowerment	High	Low	Provision of services and equipment required for the development of measurement standards, reference materials and methods
Technical Infrastructure (TI) Entities (SABS, NRCS, SANAS)	Metrology, standardisation, conformity assessment and accreditation are key elements of quality assurance of products	High	High	The TI entities supports the dtic in ensuring fair trade and reducing technical barriers to trade both internationally and locally
Consumers	Confidence in local products in terms of health and safety, and fair trade	High	Medium	Reliant on effective regulation to ensure environmental protection, human health and safety, and consumer protection



PART C

MEASURING OUR PERFORMANCE



NMISAs support to the manufacturing sector helps to ensure that manufacturing processes are precise, efficient, and compliant with local and international standards. NMISA calibrates equipment, assesses the physical and mechanical properties of materials, and provides process control services to optimise manufacturing processes. Our services are therefore critical for quality control and safety and environmental compliance which support the production of high quality products.

G1 NMISA PERFORMANCE INDICATORS

NMISA adopted a balanced scorecard approach to set and measure performance targets. The scorecard addresses the maintenance of the NMS and the administrative support required to ensure that the organisation achieves its strategic objectives.

Five key components are addressed, namely national obligations, international participation and equivalence, organisational development (learning and growth), stakeholder/customer (technical) perspective, and financial and business process perspective.

National obligations:

NMISA provides for the use of the measurement units of the SI and certain other units, the designation of NMS and units, and for keeping and maintaining the national measurement units and standards. This also includes improving existing NMS and methods and developing new NMS, secondary standards, and new reference methods or standards.

International participation and equivalence:

As part of the Metre Convention system, NMISA ensures international measurement comparability by participating in the activities of the CIPM. This includes active participation in the CCs and demonstrated measurement capabilities as published in the BIPM KCDB.

Internal organisation (learning and growth) perspective:

This perspective addresses human resources, thereby demonstrating the organisation's capacity to deliver on its mandate by maintaining a skilled, competent, and transformed work force. Key priorities include:

- Continuously develop core skills and qualifications;
- Reduce employee turnover;
- Transformation;
- Improve job satisfaction; and
- Enhance internal communications in the Human Resources function.

Stakeholder/customer perspective (technical):

Includes scientific and technical outputs, products and services developed to support the South African commerce and industry in a fast-paced global economy.

Financial and business process perspectives:

The focus is on the financial performance and sustainability of the organisation. Key priorities that are addressed include:

- Financial growth and stability are ensured by diversifying the range of service offerings;
- Effective financial controls;
- Maintaining the total quality management system and OH&S certifications;
- Improving internal processes by aligning and integrating operating systems and processes;
- Marketing and communications;
- Effective management of programmes and associated projects;
- Implementing systems to manage and protect NMISA's intellectual property;
- Contract management, client service delivery and stakeholder relationship management; and
- Risk Management.

The performance indicators of the balanced scorecard are supported by operational plans.

C2 NMISA PROGRAMMES

NMISA contributes to government key priorities, the national outcomes and has aligned its key activities to the Re-imagined Industrial Strategy, the master plans, the Economic Reconstruction and Recovery Plan and National System of Innovation goals. Its activities have been grouped into two main programmes:

- Administration Programme (including the maintenance of the units and NMS); and
- Applied Measurement Services and Products for Industry, SOEs and Regulatory Support.

The following sections address these programmes in more detail. Initiatives under these programmes were set out to highlight the focus areas and purpose, as well as the strategic deliverable and the link to NMISA and **the dtic** strategic objectives. Under the operational initiatives in Section C2.2, the service offerings also reference links to specific NMS. This is important to understand how the NMS translate into commercial services offerings which impact the local economy.



NMISA plays an important role in healthcare by ensuring that measurements and tests used in medical diagnoses, treatment, and research are accurate and reliable. Metrology helps healthcare providers to make informed decisions based on accurate and precise data, which is critical for improving patient outcomes, safety and quality of life.

C2.1 ADMINISTRATION PROGRAMME

The Administration Programme provides for overall management, administration, and operation of the organisation and leads strategy development and implementation, guides corporate governance, and provides operational support services such as information technology, financial and human resource management.

FOCUS AREAS:

1. Finance and Supply Chain
2. Human Resources, Facilities, and Information Technology Services
3. Strategy, Business Development and Governance

PURPOSE:

Provide strategic leadership management and support services to the entity for financial, human, social and environmental sustainability of the organisation.

STRATEGIC DELIVERABLES:

Strategic budgeting, cost containment, cash flow management, accurate record keeping and compliance with the PFMA and treasury regulations.

Promoting innovation, mitigating business risks, enhancing transparency, and identifying business opportunities.

Process improvements through full implementation of an enterprise resource planning (ERP) system (among others), which allow managers to review revenue generated, costs and other operating metrics on one integrated software platform, in real time.

Develop a fit-for-purpose organisational culture and improve business performance.

LINK TO NMISA STRATEGIC OBJECTIVES:

Supports all four strategic objectives.

LINK TO the dtic STRATEGIC OBJECTIVES:

Economic transformation and job creation, strengthening and building capabilities and agility in **the dtic** entities to improve efficiencies, to improve efficiencies in programmes and entities to contribute to economic development and ease of doing business.

EXPLANATION OF PLANNED PERFORMANCE:

Aligning people to processes and systems to drive organisational performance and therefore inculcate a culture conducive to an effective and efficient working environment which delivers ethically.

FUNDING ALLOCATION:

R53 409 200

C2.2 APPLIED METROLOGY CONTRIBUTIONS AND PRODUCTS FOR INDUSTRY, SOEs, AND REGULATORY SUPPORT

The products and services provided by NMISA through its Applied Metrology focus areas are delivered through:

- Research outputs from the thematic R&D programmes;
- Traceability derived from the NMS maintained by the technical divisions; and
- Operational and business support provided by the Administration Programme.

NMISA delivers its services through:

Calibration:

Delivering direct traceability to the NMS, NMISA serves the accredited calibration and testing laboratories by performing calibration to the highest accuracy (smallest uncertainty). Calibration is also provided directly to the industry in cases where there are no accredited calibration laboratories, or when the desired accuracy can only be provided by NMISA, or where a new service is needed in a very short time.

Reference measurement and certification of reference materials:

NMISA provides reference measurement and analysis according to its calibration range and services. In addition, NMISA has built the capability to value assign chemical samples and gas mixtures for customers, including purity assignment. This capability allows NMISA to produce certified (pure) reference materials (CRMs) as standards or calibration solutions for quality control purposes, and primary reference gas mixtures that are internationally recognised and accepted.

Measurements, testing and analysis:

NMISA offers advanced measurement services to industry. This includes method development for customers to assist with problem-solving and performing analysis in support of research projects and providing service solutions to clients.

Training and consultancy:

NMISA provides expertise in measurement science through training and consultancy, supporting the quality infrastructure both locally and within the continent. The expertise provided is aligned with two of the national priorities, namely building a capable state and economic transformation.

To grow the economy and support the AfCFTA, barriers to trade and entry into markets must be reduced. Measurement equivalence remains key in securing a share in both local and international markets. Knowledge transfer in terms of metrology and enhancing the quality infrastructure is therefore important to the development of a skilled and capable workforce and supporting small, medium and micro enterprises.

To this end, NMISA has established a dedicated and flexible Metrology Training Centre to enhance the fundamentals of metrology by translating core expertise vested in the organisation to add value and understanding in measurement best practices to a wider market. Special development projects to assist SMMEs have been created. NMISA staff also participate as invited lecturers in graduate courses at numerous universities, and NMISA is the official partner of the Metrology and Applied Science Research Unit (MeASURe) of the University of Cape Town.

The dissemination and measurement services are coordinated in dedicated sector-based centres under the Applied Metrology Division. The focus areas disseminated through the ARI are as follows:



In response to the risks associated with the economic downturn resulting from the countrywide lockdown in response to the COVID-19 pandemic, NMISA reprioritised its business activities to swiftly adjust to the changing climate and uncertainty within the quality infrastructure network while continuing to provide support for trade on the continent. The AfCFTA encompasses most of Africa and will progressively eliminate tariffs on intra-Africa trade, making it easier to do business on the continent and benefit from a growing African market. NMISA saw fit to translate its fundamental scientific metrology built on the solid basis of R&D into an applied metrology client-centric output and thus streamlining development, products, and services, all backed by a solid quality infrastructure in support of the AfCFTA.

NMISA has expanded its business core with the establishment of NMISA’s ARI by channelling its developed NMS, reference materials, PTS, calibration and reference measurements, consultation and liaison services, and training, into a concerted client-centric product that provides for the AfCFTA quality infrastructure support. The practical means to do this was to establish the Applied Metrology Division, and related centres, to implement the adjusted approach. The Applied Metrology focus areas have been planned as the business arm of the thematic programmes and all projects will support this applied approach.

The following pages present the focus area initiatives summarised in tabulated format.

C2.2.1 AFRICA REFERENCE INSTITUTE



**CONFORMITY
ASSESSMENT
SUPPORT**



**TRAINING AND
KNOWLEDGE
SERVICES**



**HIGH TECHNOLOGY
PRODUCT
DEVELOPMENT**

PURPOSE:

To function as an African resource centre with authoritative expertise dedicated to providing thought leadership on measurement technologies on the continent, access to advanced measurement technologies and reliable application information, in those fields critical to economic growth and social development on the African continent. Its services include reference measurements and analysis, consultation, and specialist advice, as well as education and training. It assists government entities by supporting the development of policies and regulations with impartial, reliable data. Recognising the need to enhance the ability of local producers to compete in international markets, the ARI assists companies in improving the performance of their products, gain efficiencies in production and develop reputable African brands. This is to enhance the ability of local producers to compete in the international market. The Reference Institute aims to play a key role in maintaining and enhancing a reliable African measurement framework linked to the international system of measurement. Its mission is to enhance sustainable development on the African continent. The Institute strives to assist government entities by supporting the development of policies and regulations with impartial, reliable data.

STRATEGIC DELIVERABLES:	LINK TO NMISA STRATEGIC OBJECTIVES:
<p>Training and Knowledge Services</p> <p>Providing training courses, programmes, and consultancy services aimed at improving the standards, and performance of calibration and testing laboratories locally and in Africa by providing apposite training in the relevant fields of chemical metrology, physical metrology, and engineering related to metrology. Capacity building and hands-on training will be provided in collaboration with the reference calibration and measurement centres.</p>	<p>Metrology for industry including assistance to SMMEs to provide appropriate services in support of manufacturing, beneficiation, and export.</p>
<p>Conformity Assessment Support through Calibration and Reference Measurements</p> <p>The Industry Calibration and Reference Measurement Centres' will provide multi-functional calibration and reference measurement services, aimed at addressing a wide range of industry calibration problems and ensuring accurate measurement for those sectors requiring traceability for conformity assessment purposes, especially SMMEs and the SADC region.</p> <p>These will include PTS, Inter-laboratory Comparisons, and provision of reference materials to address a wide range of contaminants and/ or target analytes in aqueous, gas and complex matrices.</p>	
<p>Support and Systems Development Centre</p> <p>The mechanical and electronics workshop and software design engineers will provide maintenance and improvement of the NMS, current research projects and applied metrology calibration services toward new measurement standards and solutions to industry sectors as identified through the various programmes. The centre will provide services that will also be offered to various external clients and will further expand its services as a strategic high-technology enabler.</p>	

LINK TO the dtic STRATEGIC OBJECTIVES:

Industrialisation, capable state, and localisation.

INPUT FROM TECHNICAL PROJECTS:

TRACEABILITY LINKS TO NMS:

All NMISA projects

DISSEMINATION PROJECTS:

All NMISA projects

EXPLANATION OF PLANNED PERFORMANCE:

Through its centres, the ARI will provide the mechanism to drive measurement excellence for NMISA through the key focus area programmes and supported by the R&D programmes.

FUNDING ALLOCATION:

R6 016 400



C2.2.2 LAW ENFORCEMENT

FORENSIC METROLOGY, ROAD SAFETY, CONSUMER PROTECTION

PURPOSE:

Law enforcement agencies need reliable measurement results to determine whether a law has been transgressed, for example accurate measurement of the speed at which a vehicle is travelling to determine if the speed limit is being adhered to, or blood alcohol analysis by a laboratory to determine whether the level of alcohol in a driver's blood was within the legal limit for driving. These agencies are highly dependent on accurate, independently verified measurement results provided by NMISA to withstand legal scrutiny in court proceedings. Similarly, to protect the consumer, regulators such as the NRCS depend on measurement results traceable to the NMS maintained by NMISA to test whether consumer goods offered on the market meet the requirements of compulsory specifications.

NMISA assists with accurate blood alcohol measurements, accurate speed measurements, reference materials for forensic analysis (including illicit drugs) and contributes to consumer protection in trade. NMISA is expanding its service offerings in the fields of reference testing and calibration. All reference measurements will be consolidated under the ARI. ARI aims to serve as a point of dispute resolution in support of compliance with regulations for various government departments, like the Department of Agriculture, Land Reform and Rural Development; Department of Environment, Forestry and Fisheries; Department of Health; South African Police Services; and Department of Mineral Resources and Energy. Services will also be provided to municipal departments and SADC countries.

STRATEGIC DELIVERABLES:	LINK TO NMISA STRATEGIC OBJECTIVES:
Provide illicit drug, pesticide and other environmental reference materials and reference solutions for use in local testing laboratories; forensic support (UV illumination for biological and chemical evidence, ballistics, arson, counterfeit detection).	Metrology for regulatory purposes in support of SAPS' forensic services.
Calibration and measurement services for radar (laser) speed trapping, Speed-trapping equipment (lidar) and speed guns for traffic departments; alternative methods for evidential breath alcohol testing; calibration and measurement services of vehicle roadworthiness (numberplate visibility, window tint levels, vehicle load) and road signals (emergency warning lights, traffic lights); calibration and testing services of body-worn cameras.	Metrology for regulatory purposes in support of national traffic law enforcement.
Certified reference materials for detecting food fraud and for food and drug authenticity testing by public and private laboratories.	Metrology for the food and drug industry to provide appropriate services in support of manufacturing and export.
Occupational regulation compliance (gas detection monitors; noise, radiation, and radiation meters; heat stress monitors) for local manufacturers.	Metrology for regulatory purposes in support of the OH&S Act.

LINK TO the dtic STRATEGIC OBJECTIVES:

Building a capable state, industrialisation.

INPUT FROM TECHNICAL PROJECTS:

TRACEABILITY LINKS TO NMS:	
23T2N5003	Organic NMS, gas NMS
23T7N3006	NMS for mass
23T3N3009	NMS for photometry and radiometry
23T3N5000	NMS for dosimetry
23T4N3011	NMS for temperature
DISSEMINATION PROJECTS:	
23T7A2305	Blood alcohol analysis
23T7A2314	Calibration of evidential breathalysers
	Calibration of speed measuring device

EXPLANATION OF PLANNED PERFORMANCE:

1. Certified reference materials provide forensic laboratories with a means to verify and demonstrate their capability to perform blood alcohol testing services.
2. A lack of comparable measurement results produced between the food testing laboratories raises doubts about the accuracy of the food label content. This in turn affects decisions made by the consumer and dietary health practitioners.
3. Measurement and calibration services for evidential breathalyser alcohol testing and speed measurement devices supports reliable law enforcement on South Africa roads, improving the safety of all road users.

Accurate measurement of the occupational conditions and working environments of factory workers enables compliance to OH&S regulations as well as the means to act against non-compliant producers.

FUNDING ALLOCATION:

R1 356 296



C2.2.3 HEALTH AND SAFETY

MEDICAL INSTRUMENTS AND DEVICES, HEALTHCARE, RADIATION SAFETY, AND LABORATORY MEDICINE

PURPOSE:

The programme aims to support medical manufactures, end users, regulators, and accreditation agencies with measurement traceability for medical devices. Partnerships with government and the Department of Health to setup internationally equivalent measurement traceability in the health sector is key to patient safety and quality control. The Health and Safety Programme intends to collaborate with relevant stakeholders to identify gaps and needs in measurement science and applications in the medical field, and to develop medical metrology techniques, measurement traceability and facilities. The programme consolidates medical metrology traceability services for health laboratories, hospitals, and clinics.

STRATEGIC DELIVERABLES:	LINK TO NMISA STRATEGIC OBJECTIVES:
Support the national network of health laboratories with multidisciplinary measurement services that are traceable to the SI system, to ensure accuracy and international comparability of measurement results from the laboratory to the patient, contributing to quality healthcare while reducing the costs associated with diagnosing and managing health.	Strategic alignment with the National Development Plan 2030 to enhance the quality of life using advanced scientific and applied metrology to support the health sector.
Provide reference measurements and calibration to regulators to enable regulatory compliance related to radiation safety and environmental radiation monitoring.	Metrology for regulatory purposes and in support of government laboratories for compliance and for development of regulations.
Offer consolidated measurement solutions to hospitals, oncology practices, clinics and other medical treatment centres, and measurement traceability to distributors and suppliers of medical devices, to establish the quality, safety, and regulatory compliance of medical measurement equipment.	Metrology consolidation for SOEs to provide efficient shared services.
LINK TO the dtic STRATEGIC OBJECTIVES:	
Building a capable state, industrialisation.	

INPUT FROM TECHNICAL PROJECTS:

TRACEABILITY LINKS TO NMS:	
23T3N3008	Pressure NMS
23T4N3011	Temperature and humidity NMS
23T3N5000	Dosimetry, radioactivity, vibration, and flow NMS
DEVELOPMENT PROJECTS:	
23T3R5101	Establishment of a low volume liquid flow calibration capability for drug delivery purposes
23T3R5102	Clinical audits for radiation practices

EXPLANATION OF PLANNED PERFORMANCE:

NMISA is providing measurement services for health laboratories and hospitals for ultraviolet germicidal irradiation disinfection, and reliable temperature screening devices. NMISA provides safer and more accurate radioactive measurements in hospitals through audits and ensuring the medical safety and traceability of medical gases and diagnostics. Concomitantly, this translates to environmental safety of nuclear devices and the provision of safe nuclear energy to society. NMISA services support primary healthcare in achieving reliability of measuring instruments such as blood pressure devices, and thermometers to improve accuracy and reduce misdiagnosis. New medical metrology techniques, measurement traceability and facilities will be developed in partnership with relevant stakeholders.

FUNDING ALLOCATION:

R125 000



C2.2.4 ENERGY EFFICIENCY

ENERGY EFFICIENT LIGHTING, LIQUID NATURAL GAS, RENEWABLE ENERGY

PURPOSE:

To develop and provide the underpinning measurement solutions needed to facilitate and support energy efficient lighting (LEDs), energy conversion processes (renewables and other alternative sources), and smart grids in support of the improvement of electrical energy efficiency.

STRATEGIC DELIVERABLES:	LINK TO NMISA STRATEGIC OBJECTIVES:
Measurement solutions for characterisation and verification of energy efficient lighting (LEDs) to support the lighting industry (manufacturers) and the NRCS.	Metrology for regulatory purposes and in support of government laboratories for compliance.
Measurement solutions as may be needed to address smart grid (ESKOM), independent power producers (IPPs), weather stations as well as municipalities' measurement requirements.	Metrology for regulatory purposes and in support of government laboratories for compliance; metrology services for SOEs.
Measurement solutions related to energy gases and other energy sources (renewable energy IPPs and municipalities).	Metrology for industry to provide appropriate services.
Reference materials in support of the energy sector. Value assignment of samples for gas to power industry.	Metrology for regulatory purposes and in support of government laboratories for compliance; metrology services for SOEs.

LINK TO the dtic STRATEGIC OBJECTIVES:

Industrialisation, capable state.

INPUT FROM TECHNICAL PROJECTS:

TRACEABILITY LINKS TO NMS:	
23T4N3004 and 23T4N3001	LED and DCLF NMS
23T2N5002	Gas analysis NMS

DEVELOPMENT PROJECTS:	
23T4A2313	Reference measurement facility for LED lighting*
23T2R2201	Industrial emissions and energy gases*

EXPLANATION OF PLANNED PERFORMANCE:

Provision of photometric and energy efficiency testing/verification of LEDs against NMISA's LED NMS will ensure that LED lamps and luminaires are within the allowable energy efficiency levels and comply with relevant compulsory standards.

Characterisation of power quality devices (e.g. for harmonics) to provide support to IPPs and ESKOM towards compliance with the grid code for connecting to the national grid promotes grid stability and ultimately a reliable and energy-efficient grid. Other measurement requirements as may be required by the electricity industry and the smart grid to improve electrical energy efficiency will be investigated.

Provision of reference measurements for energy gases, which can lead to efficient gas plant operations and improved energy efficiency with relevant considerations to prevent negative environmental effects.

FUNDING ALLOCATION:

* Budget for the two projects is accounted for in ARI and environmental monitoring and waste management.



C2.2.5 MATERIAL SCIENCE AND SERVICES

MATERIAL CHARACTERISATION, ADVANCED MATERIAL DEVELOPMENT, MATERIALS PROPERTY TESTING

PURPOSE:

NMISA's Materials Science and Services programme provides measurement solutions to various materials-based industries and research institutions at a rapid turn-around time. As a centralised, non-academic service provider, NMISA is ideally suited as an accessible hub for materials characterisation for local manufacturers, civil engineering companies, government departments responsible for infrastructure development and academia. New and improving product development, quality control, environmental effects and failure analysis are key service requests from these market sectors, which is expected to increase over the next few years. The consolidation of NMISA's materials characterisation services, including the newly installed metal 3D printer, and CT scanner, combined with advanced surface and microstructure techniques, provide fit-for-purpose topography and tomography measurement solutions for a multitude of industrial applications. Industrial activities that will benefit from NMISA's consolidated characterisation services include the determination of the quality of galvanised steel automotive components, purity analysis in support of quality of metals for export, niche particulate matter size distribution of particles emitted during manufacturing and mining, 3D tomography and mechanical properties of materials produced by additive manufacturing and traditional manufacturing routes, characterisation of advanced materials, mineral content distribution for the mining and local infrastructure projects.

STRATEGIC DELIVERABLES:	LINK TO NMISA STRATEGIC OBJECTIVES:
Elemental composition analysis of stainless-steel metal base and coatings used in the manufacturing of automotive parts.	Metrology for industry including assistance to SMMEs to provide appropriate services in support of manufacturing, beneficiation, and export.
Characterisation services for the beneficiation efforts of metals (e.g. nickel, steel), polymers and energy storage materials.	
Automated particulate matter size and composition analysis of trapped particles formed during mining operations and materials production.	
Optoelectronic, microstructural, and chemical analysis of advanced materials produced through advanced manufacturing routes and industrialisation/upscaling of nanomanufacturing.	
Characterisation of the mineral content of powders used in local infrastructure projects.	
3D tomography and mechanical properties of materials produced by additive manufacturing and traditional manufacturing routes.	LINK TO the dtic STRATEGIC OBJECTIVES: Transformation, capable state.

INPUT FROM TECHNICAL PROJECTS:

TRACEABILITY LINKS TO NMS:

23T7N3005 iMAT, photometry and length NMS

DEVELOPMENT PROJECTS:

Materials and manufacturing services

FUNDING ALLOCATION:

R500 000

EXPLANATION OF PLANNED PERFORMANCE:

Currently, the analyses of materials extend across numerous local sectors, but the planned performance is also dependent on service offerings to an international market. On the local front, support is provided to the automotive manufacturing, advanced materials, railway, and food packaging sectors where failure analyses, identification of elements in bulk or nano-material, quality control, structure and surface characterisation for quality control and product development contributes to the gross domestic product (GDP). International participation in comparative testing ensures relevance of the local service offering. Furthermore, the planned accreditation of the particle size distribution (PSD) laboratory promises additional value to mining and minerals and other sectors wherein environmental monitoring is applicable.



C2.2.6 INNOVATIVE PROJECTS

REVISION OF THE SI

PURPOSE:

Develop and implement the realisation of the new SI units to enable NMISA (as well as other NMIs on the African continent) to link its national measurement standards to the international measurement system following the redefinition of the international system of units in 2019. International equivalence of measurement results is a necessary condition for global trade and international acceptance of local measurement data for universal reporting and application.

STRATEGIC DELIVERABLES:	LINK TO NMISA STRATEGIC OBJECTIVES:
Realisation of the kg through the Kibble balance	Metrology consolidation for SOEs to provide efficient shared services.
New NMS – Voltage	
New NMS – Current	Metrology for industry including assistance to SMMEs to provide appropriate services in support of manufacturing, beneficiation, and export.
New NMS – Gravity	
LINK TO the dtic STRATEGIC OBJECTIVES:	
Industrialisation and creation of a transformed and capable state.	

INPUT FROM TECHNICAL PROJECTS:

DEVELOPMENT PROJECTS:	
23T8R3201	Kibble balance

FUNDING ALLOCATION:

R1 732 300

EXPLANATION OF PLANNED PERFORMANCE:

The Kibble balance delivery is expected in 2025 and will become the national standard for mass in 2027. Thereafter, all mass measurements performed in South Africa will have to demonstrate traceability to this standard to proof accuracy.

The new Programmable Josephson voltage standard will be implemented as a primary measurement standard for voltage from 2023 (system already successfully installed). The new Quantum Hall measurement standard for resistance is planned for installation and commissioning in 2023.

Gravimeter (g standard) is already in use, and NMISA will take part in an international comparison in September 2023 to validate the measurement capability.



C2.2.7 DIGITAL ECONOMY

TELECOMMUNICATIONS METROLOGY, DEVELOPMENT OF A CALIBRATION SETUP FOR IMAGING SENSORS, QUANTUM OPTICAL METROLOGY, STANDARD FREQUENCIES AND TIME SIGNALS, 4TH INDUSTRIAL REVOLUTION – METROLOGY INITIATIVE

PURPOSE:

The term 'digital economy' refers to the use of information technologies in the production of goods and services. NMISA has a strong science, engineering, and IT base. The Applied Metrology Division capitalises on NMISA's collective experience and expertise in metrology and technology to gain knowledge capital and to produce technology products and services for various industry sectors in South Africa, Africa, and internationally. The projects in this programme all focus on applying metrology knowledge through enabling technologies into usable solutions for customers. The five focus areas, their purposes and application in industry are:

1. Measurement solutions for the South African telecommunications regulator (ICASA) and telecommunication service providers, to support a reliable telecommunications infrastructure and high quality, affordable services to South Africans.
2. SI traceable calibration and verification measurement capabilities for imaging sensors for space and aerospace applications on the continent to ensure that data collected through earth observation is useable and internationally accepted.
3. Research and development of new quantum measurement standards and techniques as part of the South African Quantum Initiative, as this technology is maturing and becoming commercialised with applications in medical imaging, quantum computing and more secure optical communication networks.
4. Providing reference high-accuracy time and frequency signals for SARAO (SKA) as part of its time distribution infrastructure, which enables the SKA telescope to make synchronous observations with antennas at diverse locations. It includes investigation into the feasibility of an Africa Time Network – an anticipated collaborative effort between African NMIs for establishing an inter-Africa time network as a key component of a modern ICT infrastructure on the continent.
5. Developing a metrology framework for digital technologies through technology demonstrators with applications in energy distribution and manufacturing. Initially, the application of digital technologies to the calibration and verification of smart electricity meters will be investigated.

STRATEGIC DELIVERABLES:	LINK TO NMISA STRATEGIC OBJECTIVES:
A feasibility study and concept design for a fair mobile data consumption solution.	Metrology consolidation for SOEs to provide efficient shared services.
To investigate the feasibility of establishing an SI traceable calibration facility to support the South African space and aerospace industry.	Metrology for industry including assistance to SMMEs to provide appropriate services in support of manufacturing, beneficiation, and export.
Creating a theoretical model for quantum metrology techniques, including homodyne tomography.	Metrology consolidation for SOEs to provide efficient shared services.
Collaboration with SKAO on the implementation of a time reference signal from NMISA to the SKA site. Develop a concept for the Africa Time Network and establish such a network if viability is established.	Metrology consolidation for SOEs to provide efficient shared services.
Perform a 4IR and metrology technology study with recommendations for implementation. Determine the feasibility and if confirmed, design and develop an automated calibration facility for smart electricity meters.	Metrology for industry including assistance to SMMEs to provide appropriate services in support of manufacturing, beneficiation, and export.

LINK TO the dtic STRATEGIC OBJECTIVES:

Transformation and capable state.

INPUT FROM TECHNICAL PROJECTS:

TRACEABILITY LINKS TO NMS:

23T5N3012	Time, frequency and fibre optic NMS
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DEVELOPMENT PROJECTS:

23T8A2302	Mobile data application
23T5R3201	Quantum optical metrology
23T5A2303	Time traceability for SKA

FUNDING ALLOCATION:

R1 760 000

EXPLANATION OF PLANNED PERFORMANCE:

1. The mobile data application aims to provide consumers with the means to verify their mobile data consumption, enabling them to manage their data costs. It assists the regulator in the execution of its consumer protection mandate.
2. Traceability to the NMS for optical radiometry will allow space agencies and engineering services to demonstrate that the data collected by satellites are linked to the international measurement system and can therefore be relied upon as the basis for public policy and commercial decisions.
3. A published theoretical model for quantum metrology techniques, including homodyne tomography, will contribute to the growth of a local quantum technology industry in South Africa, supported by measurements science, in preparation for the quantum future.
4. A time reference signal from NMISA to the SKA site would contribute internationally recognised local expertise and infrastructure to a key international scientific project, enabling sustainable growth in local expertise, which can be extended to NMIs on the rest of the continent through an Africa Time Network as part of infrastructure development.

An automated calibration facility for smart electricity meters would enable verification of energy savings. The expertise gained through systems design and analysis of large data sets would stimulate the development of 4IR technologies at NMISA.



C2.2.8 AGRICULTURE AND FOOD

DEVELOPMENT OF REFERENCE METHODS, REFERENCE MATERIALS, AND THE CO-ORDINATION OF PTS FOR FOOD AND FEED (INCLUDING CONTRIBUTIONS TO THE FISHERIES OR AQUACULTURE, AND POULTRY INDUSTRIES)

PURPOSE:

This programme provides quality assurance services that empowers food and agricultural testing laboratories to deliver accurate results. These results confirm food safety and quality according to regulatory requirements and so enables fair trade and protection of public health. With the introduction of the AfCFTA, the risk to the food supply chain will be increased through frictionless trade between countries, necessitating the strengthening of local and regional testing capabilities. An established quality infrastructure must be maintained to ensure mutual recognition of measurement results produced on the continent, to promote intra- and extra-African trade. This programme therefore produces proudly (South) African reference measurements, reference materials and PTS for Africa-relevant and indigenous commodities, towards replacing costly imports and to contribute towards economic sustainability of critical food testing services. This aligns with the African Union Food Safety Strategy for Africa 2022–2036 that prioritises the protection of public health and economic growth by enabling global and regional trade and promotes the sustainability of scientific testing capacity. The programme includes initiatives such as capacity building aligning with **dtic** strategic objectives for the South African fish and poultry industries, the cassava product value chain, and the implementation of the new SANS standard for drinking water through collaboration with other technical infrastructure institutes. This programme therefore supports the needs of commercial food testing laboratories, food exporters, government monitoring and inspection laboratories (DARLD, DFFE, DoH, SAPS and DMRE), food safety regulators, consumer protection bodies and the AfCFTA agreements assisting in trade security.

STRATEGIC DELIVERABLES:	LINK TO NMISA STRATEGIC OBJECTIVES:
Reference measurement for new product development in agricultural production/ processing to support the activities in the deliverables that follow. These measurement services, once developed, are then also delivered commercially under the analytical reference laboratory.	Metrology for industry (including assistance to SMMEs, beneficiation, and export). Metrology consolidation for SOEs to provide efficient shared services.
Production and stability monitoring of African-relevant reference materials according to international standard requirements. The new materials prepared will include vitamin A fortified vegetable oil, heavy metals in fish, as well as cyanide and pesticides in cassava.	Metrology for industry (including assistance to SMMEs, beneficiation, and export).
Developing and running PTS and capacity building programmes to ensure maintenance of the South African quality infrastructure, and support trade within the AfCFTA. PT materials are also sold as quality control materials afterwards. There are 15 PTS planned for the year. Four PTS for the determination of pesticides in fruit, the largest contributor to border rejections from South Africa into the EU. The fruit include grapefruit, pears, guava and grapes and these PTS align with the fruit harvest seasons. A tetracycline antibiotic residue in chicken PTS in support of the poultry industry. In support of fisheries activities, a PTS for the determination of heavy metals in fish. Three mycotoxin PTS for peanut, milk powder and feed products. Two PTS to address and evaluate the quality of cassava will be conducted (pesticide and cyanide content) as well as three additional PTS to assess element content and food labelling criteria (Vitamin A in oil and sugar; toxic and nutritional elements in cocoa powder; amino acids, elements and proximate in fortified milk powder).	Metrology for regulatory purposes. Metrology consolidation for SOEs to provide efficient shared services.

LINK TO the dtic STRATEGIC OBJECTIVES:

Industrialisation, transformation, and capable state Aquaculture Development and Enhancement Programme Poultry Industry Master Plan.
AfCFTA readiness.

INPUT FROM TECHNICAL PROJECTS:

TRACEABILITY LINKS TO NMS:

23T2N5003	Organic analysis – Developing and maintenance of NMS
	iMAT – Developing and maintenance of NMS

DEVELOPMENT PROJECTS:

23T6R2101	Food contaminants
23T6R2104	Food labelling
23T6R2106	Mycotoxins

FUNDING ALLOCATION: R1 805 500

EXPLANATION OF PLANNED PERFORMANCE:

1. These services allow laboratories to independently confirm the accuracy of their test results, demonstrating competence to regulators and clients, thereby ensuring regulatory compliance for food safety and quality. The reference measurements are firstly developed to assign values to reference materials which are used in PTS; sold as quality control materials or CRMs. Reference measurements are also delivered as testing and training services through the ARI, contributing to scientific capacity building and analytical support for food producers.
2. Material production selection is based on 1) food safety and quality parameters that experience the most technical barriers to trade; i.e. suffer most border rejections or impact public health, by not meeting regulatory requirements, or 2) where no CRMs exist for indigenous African foods. Use of these new materials will allow products to be tested, to allow safe market entry for consumption and compliance with i) mandatory food fortification regulations (Vitamin A), ii) FAO CODEX Committee for Africa standards for cassava products and iii) compulsory specifications for fish and fish products.
3. Proficiency testing schemes are selected based on public and private client requests, these are needed to comply with food safety and quality regulations and ISO/IEC 17025 accreditation requirements. The PTS also contribute to building scientific capacity within the AfCFTA and are delivered to food monitoring and inspection laboratories across Africa. Successful participation in PTS provide independent evidence of the laboratories' measurement capability to routinely provide accurate results, these are critical for regulatory compliance to ensure public health and safety.



C2.2.9 ENVIRONMENTAL MONITORING AND WASTE MANAGEMENT

MINING, ENVIRONMENTAL MONITORING

PURPOSE:

To develop the standards and reference methods needed to provide reference values, testing and analysis services for monitoring the baseline levels of various toxic environmental contaminants in South Africa and the region. Reliable data enable mining and manufacturing companies (as well as regulators) to verify their compliance with environmental standards and regulations to ensure that air, water and soil conditions remain safe and free of harmful pollutants to protect human health.

STRATEGIC DELIVERABLES:	LINK TO NMISA STRATEGIC OBJECTIVES:
Reference measurements of emissions from manufacturing, agriculture, and mining sectors in support of better air quality in South Africa and safeguarding the environment.	Metrology for industry including assistance to SMMEs to provide appropriate services in support of manufacturing, beneficiation, and export. Metrology consolidation for SOEs to provide efficient shared services.
Reference measurements in support of the food industry through value assignment of organic and inorganic toxicants in food matrices to comply with export regulation.	Metrology for regulatory purposes and in support of government laboratories for compliance and for development of regulations.
Testing and analysis of various chemical composition; toxic elements and organic contaminants in environmental samples, soils, sludges, and mine tailings.	
Provision of reference materials for environmental monitoring and value assignment of environmental samples.	
Promote reliable reporting of emission measurements through the provision of primary reference gas mixtures for air pollution monitoring sector that are internationally equivalent and traceable to the SI unit.	
Analysis of environmental and food samples for radionuclides in support of the nuclear energy sector.	
Support the mining sector by providing various measurement solutions that are traceable to the SI units that promote safety in the workplace.	Metrology for industry including assistance to SMMEs to provide appropriate services in support of manufacturing, beneficiation, and export.

LINK TO the dtic STRATEGIC OBJECTIVES:

Industrialisation and capable state.

INPUT FROM TECHNICAL PROJECTS:

TRACEABILITY LINKS TO NMS:

23T2N5002	Gas analysis NMS
23T2N5003	Organic analysis NMS
23T3N5001	Radioactivity standards NMS
23T2N5004	Inorganic NMS

DEVELOPMENT PROJECTS:

23T2R2203	Environment and ambient gases
23T2R2201	Industrial emissions and energy gases
23T2R2202	Microplastics
23T2R2204	Volatile organic compounds from recycled plastic

FUNDING ALLOCATION:

R6 746 484

EXPLANATION OF PLANNED PERFORMANCE:

1. The provision of reference materials for emission monitoring will enable compliance with legislation and ensure reliable reporting of emission measurement into the South African Air Quality Information System. To provide reliable emission data to ensure that industries emitting above-set minimum emission thresholds are held accountable to improve the quality of life for all.
2. Provide reference measurements in food and environmental samples to support food safety and comply to export requirements. These measurements will ensure that products from South Africa meet set export requirements thereby removing the technical barrier to trade.
3. Ensure the continued safety of the South African population by promoting responsible environmental monitoring, through availability of reference materials such as primary reference gas mixtures, radioactivity measurements and the capacity to measure analytically challenging organic pollutants such as dioxins and polychlorinated biphenyls.
4. Assist industry with measurement in the realm of plastics to ensure sustainability and increase the ease for doing environmentally responsible business within the African continent.

C3 PROGRAMME BUDGETS

Research programme budgets and outputs are shown for the Medium-Term Expenditure Framework period, i.e. 2023 to 2026. The project details with specific deliverables and dates are available in the programme business plans for 2023/24.

C3.1 PROGRAMME RESOURCE CONSIDERATIONS

Table 5: 2023/24 to 2025/26 Budget Estimates

NMISA CONSOLIDATED BUDGET 2023/24–2025/26			
	2023/24	2024/25	2025/26
	R'000	R'000	R'000
		5 % (existing)	6 % (existing)
Revenue	210 214	220 266	231 035
Transfers received	169 691	177 312	185 504
Rendering of service	36 523	38 714	41 037
Investment income	4 000	4 240	4 494
Expenditure	210 214	220 266	231 035
Administrative and operating expenditure	69 208	73 404	77 800
Employee cost	130 245	135 455	141 144
Repairs and maintenance	9 961	10 559	11 192
Audit fees	800	848	899

C3.2 EXPENDITURE ESTIMATES

Table 6: NMISA expenditure estimates

STATEMENT OF FINANCIAL PERFORMANCE	BUDGET	AUDITED OUTCOME	BUDGET	AUDITED OUTCOME	BUDGET	AUDITED OUTCOME
	2019/20		2020/21		2021/22	
R thousand						
Revenue						
Tax revenue	-	-	-	-	-	-
Non-tax revenue	51 018	38 972	32 467	23 689	31 167	27 241
Sale of goods and services other than capital assets	38 018	21 843	19 467	14 833	24 995	18 701
Sales of goods and services produced by entity of which:	38 018	21 843	19 467	14 833	24 995	18 701
Administrative fees	-	-	-	-	-	-
Sales by market establishment	38 018	21 843	19 467	14 833	24 995	18 701
Other sales	-	-	-	-	-	-
Sales of scrap, waste, arms and other used current goods	-	-	-	-	-	-
Other non-tax revenue	13 000	17 129	13 000	8 856	6 172	8 540
Transfers received	245 036	245 328	223 291	223 331	261 716	261 716
Total revenue	296 054	284 300	255 758	247 020	292 883	288 957
Expenses						
Current expenses	222 317	240 253	210 606	239 551	235 120	253 541
Compensation of employees	141 906	121 432	131 884	131 570	149 439	133 068
Goods and services	80 411	81 059	78 722	66 654	85 676	76 735
Depreciation	-	37 750	-	41 114	-	43 733
Interest, dividends and rent on land	-	12	-	213	5	5
Transfers and subsidies	-	-	-	-	-	-
Total expenses	222 317	240 253	210 606	239 551	235 120	253 541
Surplus/(Deficit)	73 737	44 047	45 152	7 469	57 763	35 416

	BUDGET ESTIMATE	APPROVED BUDGET	OUTCOME/BUDGET AVERAGE %	AVERAGE GROWTH RATE (%)	EXPEN-DITURE/ TOTAL: AVERAGE (%)	MEDIUM-TERM ESTIMATE			AVERAGE GROWTH RATE (%)	EXPEN-DITURE/ TOTAL: AVERAGE (%)
	2022/23		2019/20–2022/23			2023/24	2024/25	2025/26	2022/23–2025/26	
	-	-	-	-	-	-	-	-	-	-
	32 600	32 981	83.5 %	-5.4 %	11.8 %	40 523	42 954	45 531	11.3 %	18.2 %
	26 167	26 981	75.8 %	7.3 %	8.0 %	36 523	38 714	41 037	15.0 %	16.1 %
	26 167	26 981	75.8 %	7.3 %	8.0 %	36 523	38 714	41 037	15.0 %	16.1 %
	-	-	-	-	-	-	-	-	-	-
	26 167	26 981	75.8 %	7.3 %	8.0 %	36 523	38 714	41 037	15.0 %	16.1 %
	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
	6 433	6 000	105.0 %	-29.5 %	3.8 %	4 000	4 240	4 494	-9.2 %	2.1 %
	268 576	195 704	92.7 %	-7.3 %	88.2 %	169 691	177 312	185 504	-1.8 %	81.8 %
	301 176	228 685	91.5 %	-7.0 %	100.0 %	210 214	220 266	231 035	0.3 %	100.0 %
									-	
	246 074	221 089	104.4 %	-2.7 %	100.0 %	210 214	220 266	231 035	1.5 %	100.0 %
	155 760	133 552	89.7 %	3.2 %	54.6 %	130 245	135 455	141 144	1.9 %	61.2 %
	90 314	87 537	93.1 %	2.6 %	32.9 %	79 969	84 811	89 891	0.9 %	38.8 %
	-	-	-	-100.0 %	12.5 %	-	-	-	-	-
	-	-	4 600.0 %	-100.0 %	0.0 %	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-
	246 074	221 089	104.4 %	-2.7 %	100.0 %	210 214	220 266	231 035	1.5 %	100.0 %
	55 102	7 596		-44.3 %		-	-	-	-100.0 %	

CASH FLOW DATA	BUDGET	AUDITED OUTCOME	BUDGET	AUDITED OUTCOME	BUDGET	AUDITED OUTCOME
	2019/20		2020/21		2021/22	
R thousand						
Cash flow from operating activities	73 737	53 376	45 152	33 928	57 763	77 677
Receipts						
Tax receipts	-	-	-	-	-	-
Non-tax receipts	51 018	36 663	32 467	25 115	31 167	26 239
Sales of goods and services other than capital assets	38 018	19 677	19 467	16 421	24 995	17 816
Sales of goods and services produced by entity (excl. capital assets)	38 018	19 677	19 467	16 421	24 995	17 816
of which:						
Administrative fees	-	-	-	-	-	-
Sales by market establishment	38 018	19 677	19 467	16 421	24 995	17 816
Other sales	-	-	-	-	-	-
Sales of scrap, waste, arms and other used current goods (excl. capital assets)	-	-	-	-	-	-
Other non-tax receipts	13 000	16 986	13 000	8 694	6 172	8 423
Transfers received	245 036	245 328	223 291	223 331	261 716	261 716
Financial transactions in assets and liabilities	-	40	-	162	-	-
Total receipts	296 054	282 031	255 758	248 608	292 883	287 955
Payment						
Current payments	222 317	228 655	210 606	214 680	235 120	210 278
Compensation of employees	141 906	126 078	131 884	132 877	149 439	133 127
Goods and services	80 411	102 577	78 722	81 590	85 676	77 146
Interest and rent on land	-	-	-	213	5	5
Transfers and subsidies	-	-	-	-	-	-
Payments for financial assets	-	-	-	-	-	-
Total payment	222 317	228 655	210 606	214 680	235 120	210 278
Cash flow from advancing activities (Financial Institutions only)	-	-	-	-	-	-
Disbursements and other payments	-	-	-	-	-	-
Repayments and other receipts	-	-	-	-	-	-
Cash flow from investing activities	(73 737)	(71 347)	(45 152)	(51 548)	(57 763)	(87 914)
Acquisition of property, plant, equipment and intangible assets	(72 733)	(73 122)	(44 500)	(50 690)	(56 863)	(86 503)
Investment property	-	-	-	-	-	-
Acquisition of software and other intangible assets	(1 004)	(1 347)	(652)	(859)	(900)	(1 569)
Proceeds from the sale of property, plant, equipment and intangible assets	-	3 122	-	1	-	158
Other flows from investing activities	-	-	-	-	-	-
Cash flow from financing activities	-	-	-	-	-	-
Deferred income	-	-	-	-	-	-
Borrowing activities	-	-	-	-	-	-
Repayment of finance leases	-	-	-	-	-	-
Other flows from financing activities	-	-	-	-	-	-
Net increase/(decrease) in cash and cash equivalents	-	(17 971)	-	(17 620)	-	(10 237)

FINANCIAL POSITION	BUDGET	AUDITED OUTCOME	BUDGET	AUDITED OUTCOME	BUDGET	AUDITED OUTCOME
	2019/20		2020/21		2021/22	
R thousand						
Carrying value of assets	73 737	478 298	45 152	488 013	57 763	532 311
of which:						
Acquisition of assets	(72 733)	(73 122)	(44 500)	(50 690)	(56 863)	(86 503)
Investments	–	605	–	–	–	–
Inventory	–	8 591	–	8 185	6 120	9 128
Loans	–	–	–	–	–	–
Accrued investment interest	–	–	–	–	–	–
Receivables and prepayments	–	33 118	–	44 178	42 544	51 024
Cash and cash equivalents	–	162 500	–	144 880	131 890	134 644
Non-current assets held for sale	–	–	–	–	–	–
Defined benefit plan assets	–	–	–	–	–	–
Taxation	–	–	–	–	–	–
Derivatives financial instruments	–	–	–	–	–	–
Total assets	73 737	683 112	45 152	685 256	238 317	727 107
Accumulated surplus/(deficit)	73 737	649 865	45 152	657 334	213 637	692 750
Capital and reserves	–	–	–	–	–	–
Capital reserve fund	–	–	–	–	–	–
Borrowings	–	–	–	–	–	–
Finance lease	–	–	–	–	–	–
Accrued interest	–	–	–	–	–	–
Deferred income	–	–	–	–	–	–
Trade and other payables	–	16 944	–	12 930	12 030	20 068
Benefits payable	–	–	–	–	–	–
Capitalised value of pensions	–	–	–	–	–	–
Taxation	–	–	–	–	–	–
Provisions	–	16 303	–	14 992	12 650	14 289
Managed funds (e.g. poverty alleviation fund)	–	–	–	–	–	–
Derivatives financial instruments	–	–	–	–	–	–
Total equity and liabilities	73 737	683 112	45 152	685 256	238 317	727 107
Contingent liabilities	–	–	–	–	–	–

	BUDGET ESTIMATE	APPROVED BUDGET	OUTCOME/BUDGET AVERAGE %	AVERAGE GROWTH RATE (%)	EXPEN-DITURE/ TOTAL: AVERAGE (%)	MEDIUM-TERM ESTIMATE			AVERAGE GROWTH RATE (%)	EXPEN-DITURE/ TOTAL: AVERAGE (%)
	2022/23		2019/20–2022/23			2023/24	2024/25	2025/26	2022/23–2025/26	
	55 102	539 906	879.6 %	4.1 %	72.5 %	582 925	584 288	580 914	2.5 %	77.6 %
	(54 164)	(6 696)	95.1 %	-54.9 %	-7.7 %	–	–	–	-100.0 %	-0.2 %
	2 605	–	23.2 %	-100.0 %	0.0 %	–	–	–	–	–
	5 960	5 960	263.8 %	-11.5 %	1.1 %	4 030	3 820	4 570	-8.5 %	0.6 %
	–	–	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–	–	–
	36 820	39 710	211.7 %	6.2 %	6.0 %	41 300	41 560	30 250	-8.7 %	5.2 %
	128 500	128 500	219.1 %	-7.5 %	20.4 %	126 600	125 100	110 000	-5.0 %	16.6 %
	–	–	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–	–	–
	228 987	714 076	479.3 %	1.5 %	100.0 %	754 855	754 768	725 734	0.5 %	100.0 %
	205 919	703 658	502.1 %	2.7 %	96.2 %	745 315	747 143	718 041	0.7 %	98.8 %
	–	–	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–	–	–
	10 418	10 418	268.9 %	-15.0 %	2.1 %	9 540	7 625	7 693	-9.6 %	1.2 %
	–	–	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–	–	–
	12 650	–	180.2 %	-100.0 %	1.6 %	–	–	–	–	–
	–	–	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–	–	–
	228 987	714 076	479.3 %	1.5 %	100.0 %	754 855	754 768	725 734	0.5 %	100.0 %
	–	–				–	–	–		

C3.3 OUTCOMES, OUTPUTS, PERFORMANCE INDICATORS AND TARGETS

NMISA has aligned its key performance indicators to support the strategic thrusts for the organisation and business model.

Table 7: Programme Performance Indicators 2023/24

IMPACT/OUTCOME	OUTPUT	OUTCOME INDICATOR	
Programme 1: Administration (including the units and NMS)			
Jobs supported by interventions	Non-permanent positions filled and work-place ready after intervention	Number of interns and in-service trainees hosted	
Creation of an effective metrology system that enables a sustainable socio-economic environment supported by internationally accepted measurement results	Provide for the measurement needs of South Africa and the region by dissemination of the units and NMS to national and regional laboratories	Income generated	
		Percentage actual expenditure to budget	
<u>Support for new energy projects</u> New measurement services for energy efficient lighting and for maintaining the national power grid, expanded through introduction of renewable energy sources through IPPs <u>Climate initiatives</u> Provision of certified reference gas mixtures for air monitoring	Shared metrology services for government departments and SOEs	Number of accredited laboratories and new laboratory accreditations	
<u>Market inquiries</u> Increase the visibility of NMISA in the market through marketing and sales initiatives and manage market enquiries through a new Contact Centre Provision of measurement solutions through the National Measurement Standards		Percentage increase in visibility of NMISA	
Red tape reduction interventions	Digitalisation of NMISA business systems through implementation of an ERP, CMS and project management systems	Percentage customer satisfaction	
Provide measurement support services in areas outside the five main metros and within SEZs <u>Legislation</u> Support law enforcement through demonstrated accuracy of measurement results in legal proceedings	Extend measurement service support to SOEs Undertake specific outreach programmes to provide measurement services within districts and within SEZs Metrology expertise and services provided to settle legal disputes based on the results of measurements	Number of new government departments and SOEs serviced by NMISA	
Local industrial output	Measurement services for local industry for quality control of manufactured products to enhance competitiveness in local and export markets	Percentage increase of NMISA clients from the private sector	
To provide metrology for regulatory purposes	Revised Measurement Act to support and contribute to national regulation	Participate in the dtic technical infrastructure (TI) review	

	ACTUAL PERFORMANCE			ESTIMATED PERFORMANCE	MEDIUM-TERM TARGETS		
	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
	25	15 interns hosted	31	30	12	13	13
	R20 799 163.24	R14 203 999	R18 706 997	R26 697 333	R36 522 741	R38 714 000	R41 037 000
	98 %	100 %	99 %	98 %	98 %	98 %	98 %
	23	24	23 maintained and 1 new accreditation	24 maintained and 2 new accreditations (26)	Maintain 25 and 1 new accreditation	Maintain 26	Maintain 26
	New KPI	49 % increase in visibility	8 %	20 % increase in visibility	10 % increase in visibility	10 % increase in visibility	10 % increase in visibility
	≥95 %	99 %	98.34 %	≥95 %	≥95 %	≥95 %	≥95 %
	3	2	4	4	3	3	4
	New KPI	New KPI	New KPI	5 % increase in the number of clients from the private sector served	10 % increase in the number of clients from the private sector served	10 % increase in the number of clients from the private sector served	-
	NMISA reviewed the Act and submitted to the dtic	NMISA participated in the dtic TI review Submission with potential changes was made to the Board. NMISA awaits the finalisation of the dtic process	Updates with regard to NMISA's participation in the dtic TI review were submitted to the Board as planned. NMISA awaits the outcome from the dtic	Participate in the dtic TI review	Participate in the dtic TI review	-	-

IMPACT/OUTCOME	OUTPUT	OUTCOME INDICATOR	
Jobs supported by interventions Transformation of the work environment to ensure representativity, and the effective dissemination of the units and NMS to national and regional laboratories	Full-time permanent jobs filled within NMISA during the year	Percentage funded vacancies	
	Provide for the measurement needs of South Africa and the region	Reduced turnaround times for filling vacancies in line with the approved recruitment plan	
		Percentage of NMISA support to the transformation agenda of South African and African markets	
Programme 2: Applied Measurement Services and Products for Industry, SOEs and Regulatory Support			
Create a capable state through the development of the NMS, maintaining the units at an internationally recognised level, and shorten the traceability chain for Africa through the dissemination of the NMS to support the implementation of the AfCFTA New national energy projects supported by development plans for new measurement capabilities of green hydrogen and derivative products	Implementation of the revised SI	Number of SI base units realised	
		Number of new and improved NMS and reference materials and reference methods	
Enabling trade agreements such as BRICS, AGAO, TBA (UK, EU, SADC, AFCFTA) by linking the national and regional measurement system internationally under the Metre Convention Treaty	Linking the national and regional measurement system internationally	Number of interlaboratory comparisons (ILCs) and PTS organised and completed	
		Number of memberships maintained and active participation in the CIPM and its consultative committees	
		Percentage metrological services covered by CMCs	
Support Programmes for SMMEs Transform industry through equipping human capital with the science behind measurement to ensure the effective dissemination of the units and NMS to national and regional laboratories and support the black industrialist initiatives	Provide for the measurement needs of South Africa and the region through knowledge development Develop a support programme specifically for SMMEs	Number of metrologists trained for revenue generation	
		Number of courses provided including SMMEs	

	ACTUAL PERFORMANCE			ESTIMATED PERFORMANCE	MEDIUM-TERM TARGETS		
	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
	New KPI	New KPI	New KPI	6 %	5 %	4 %	4 %
	New KPI	New KPI	New KPI	4 months for job levels C5 and higher 3 months for lower job levels	Fill all new positions in line with the approved recruitment plan within 4 months for job levels C5 and higher Fill all vacant positions in line with the approved recruitment plan within 3 months for lower job levels	3 months for job levels C5 and higher 2 months for lower job levels	
	New KPI	New KPI	New KPI	New KPI	70 % of NMISA transactions to contribute to transformation of both South African (in support of SMME) and regional (in support of the AfCFTA) market	70 %	
	6 base units realised	6 base units realised	6 base units realised	Quarterly reports on 6 base units realised	Quarterly reports on 6 base units realised	Quarterly reports on 6 base units realised	Quarterly reports on 6 base units realised
	21	25	28	17	14	17	18
	9	23	25	30	14	15	16
	10	10	10	10	10	10	10
	81 %	80 %	90.52 %	85 %	90 %	92 %	94 %
	120	0	155	133	35	40	45
	18	10	20	24	25	25	30

Table 8: Quarterly Targets 2023/24

OUTPUT	PERFORMANCE MEASURE OR OUTCOME INDICATOR	BASELINE	ANNUAL TARGET 2023/24
Programme 1: Administration (including the units and NMS)			
Jobs supported by interventions	Non-permanent positions filled and work-place ready after intervention	30 interns hosted	12 interns/in-service trainees hosted
Measurement products and services provided to industry New measurement services for energy efficient lighting and for maintaining the national power grid Provision of certified reference gas mixtures for air monitoring	Amount of income generated	R26 697 333	R36 522 741
	Percentage actual expenditure to budget	98 %	98 %
	Number of accredited laboratories maintained and new laboratory accreditations	24 maintained and 1 new accreditation	25 maintained and 1 new accreditation
Increased market enquiries managed through a new Contact Centre	Percentage increase in visibility of NMISA	20 % increase in visibility	10 % increase in visibility
Improve customer service by digitalisation of NMISA business systems through implementation of an ERP, CMS and project management systems	Percentage customer satisfaction	≥95 %	≥95 %
Provide measurement support services in areas outside the five main metros Specific outreach programmes to provide measurement services within districts and SEZs included Measurement support for law enforcement	Number of additional government departments, SOEs	4	3
Measurement services for local industry for quality control of manufactured products to enhance localisation	Percentage increase of NMISA clients from the private sector	5 % increase in the number of clients from the private sector served	10 % increase in the number of clients from the private sector served
	Participate in the dtic technical infrastructure (TI) review	Participated in the dtic TI review	Participate in the dtic TI review
Permanent jobs filled at NMISA	Percentage funded vacancies	6 %	5 %
	Reduced turnaround times for filling vacancies in line with the approved recruitment plan	Fill all new positions in line with the approved recruitment plan within 4 months for job levels C5 and higher Fill all vacant positions in line with the approved recruitment plan within 3 months for lower job levels	All new positions filled in line with the approved recruitment plan: Turnaround times for filling vacancies in line with the approved recruitment plan
	Percentage of NMISA support to the transformation agenda of South African and African markets	New KPI	70 % of NMISA transactions to contribute to transformation of South African (in support of SMME) and regional (in support of the AfCFTA) market

	1 ST QUARTER MILESTONE	2 ND QUARTER MILESTONE	3 RD QUARTER MILESTONE	4 TH QUARTER MILESTONE
	Host 10 interns/in-service trainees	Host 12 interns/in-service trainees	Host 12 interns/in-service trainees	Host 12 interns/in-service trainees
	R3 652 274.10	R8 217 616.72	R9 861 140.04	R14 791 710.20
	10 %	40 %	60 %	98 %
	25 maintained	25 maintained	25 maintained	25 Maintained and 1 new accreditation
	2.5 %	5 % (2.5 %)	7.5 % (5 %)	10 % (7.5 %)
	≥95 %	≥95 %	≥95 %	≥95 %
	0	0	1	2
	-	-	-	10 % increase in the number of clients served from the private sector
	-	Report to the Board on progress on the review	-	Report to the Board on progress on the review
	10 %	8 %	6 %	5 %
	All new positions filled in line with the approved recruitment plan: 4 months for job levels C5 and higher 3 months for lower job levels	All new positions filled in line with the approved recruitment plan: 4 months for job levels C5 and higher and 3 months for lower job levels	All new positions filled in line with the approved recruitment plan: 4 months for job levels C5 and higher and 3 months for lower job levels	All new positions filled in line with the approved recruitment plan: 4 months for job levels C5 and higher and 3 months for lower job levels
	10 %	25 %	25 %	40 %

OUTPUT	PERFORMANCE MEASURE OR OUTCOME INDICATOR	BASELINE	ANNUAL TARGET 2023/24	
Programme 2: Applied Measurement Services and Products for Industry, SOEs and Regulatory Support				
Implementation of the revised SI, linking the national and regional measurement system internationally to support international trade agreements	Number of SI base units realised	Reports on the 6 base units of the SI realised	Reports on the 6 base units of the SI realised	
	Number of new and improved NMS and reference materials and reference methods	17	13	
	Number of ILCs and PTS organised and completed	Organised and complete 30 ILCs and PTS	Organise and complete 14 ILCs and PTS	
	Number of memberships maintained	10 CCs	Maintain membership of 10 CCs	
	Percentage of metrological services covered by CMCs (i.e. internationally accepted)	85 % of metrological services covered by CMCs	90 % of metrological services covered by CMCs	
Linking the national and regional measurement system Internationally	Number of metrologists trained	133 metrologists trained	35 metrologists trained	
Provide for the measurement needs of South Africa and the region through knowledge development	Number of courses provided including SMMEs	24 courses provided including SMMEs	25 courses provided including SMMEs	
Develop a support programme specifically for SMMEs				

	1 ST QUARTER MILESTONE	2 ND QUARTER MILESTONE	3 RD QUARTER MILESTONE	4 TH QUARTER MILESTONE
	Reports on the 6 base units of the SI realised	Reports on the 6 base units of the SI realised	Reports on the 6 base units of the SI realised	Reports on the 6 base units of the SI realised
	0	0	0	13
	0	0	0	14
	10	10	10	10
	-	-	-	90 %
	0	0	0	35
	5	5	5	10

C4 DTIC OUTPUT TARGETS

The revision of **the dtic** outcomes in prior years has been accompanied by a more detailed set of outputs and output Indicators, which are more clearly aligned. The table below outlines the indicators applicable to the department in the 2023/24 reporting period. This is the second year working with the new integrated approach.

Important and key decisions that are taken at various parts of the value chains of business, economic, social, medical, as well as population and consumer safety are based measurement results. It is therefore imperative that measurements taken in the country are accurate, internationally equivalent to the international system and most importantly accepted by our trading partners. NMISA as the National Metrology Institute of South Africa is tasked with the mandate to ensure the required accuracy, international equivalence and acceptance of all measurement that forms the base for testing and conformity assessment that are conducted throughout the value chains of quality management, control and regulation in the country and its economy.

NMISA is a key enabler for industrialisation. Today, as South Africa is building a new model of inclusive economic growth, driven by **the dtic**, the existing modern metrology infrastructure developed by NMISA over many years is well-integrated over all local economic sectors, with well-established networks on the continent and internationally equivalent measurement capabilities. In conjunction with all TI entities, metrology forms one of the foundations of strategies to increase the country's productive capacity and trade.

Industrial production: Accurate measurement is a key factor in manufacturing. Performing measurements that are traceable to the SI (equivalent to international measurement standards) throughout all manufacturing processes. Accurate measurements ensure effective quality control during manufacturing processes, to ensure products are free from defects, the process reduces waste, and the product meets the customer's expectations before it leaves the manufacturing facility.

Local manufacturers cannot compete successfully with high-quality imported products unless it can proof conformance to

international product specifications. Conformance to product specifications is demonstrated through measurement results that are demonstrated to be accurate. In South Africa, it requires traceability to the NMS as maintained by NMISA.

Exports and Trade: NMISA offers measurement traceability through the calibration of instruments, provision of reference materials and measurements used in the automotive, agriculture, health, mining, and manufacturing industries. These measurements are essential for ensuring the quality and reliability of products being exported and traded. NMISA enables the South African exporters and traders to establish credibility and reputation, avoid disputes, and ensure compliance with regulatory requirements by providing accurate and traceable measurements and international standards. NMISA, through its hosting of the AFRIMETS Secretariat, contributes substantially to the appropriate development of Metrology in Africa as required for the AfCFTA.

Transformation: A capable and ethical state is a prerequisite for policy certainty, which translates into business and consumer confidence; both necessary inputs into economic growth, which creates jobs. Through its Training Centre resources, NMISA aims to provide dynamic measurement science training and consultancy to various sectors and activities that underpin external trade and the broader economy. The deficit in capabilities and experience in our young scientists can be strengthened through this endeavour and in support of the transformation efforts in place to reinforce our base and minimise technical barriers to trade through knowledge transfer. Key training areas identified include SMME training in laser safety, calibration, food testing and measurement traceability for conformity assessment.

Jobs: NMISA embarked on a Human Capital Development plan that supported capacity and capability training for young scientists and engineers. This support is provided through tertiary bursaries for Masters' and Doctoral studies, work-back contracts, and internships. The main aim is to absorb young talent into the organisation, and if not, then these individuals are trained and contribute to the workforce skills needed in the country, especially in STEM fields.

Green Economy: The output under the Green Economy KPI has been listed as “Finalisation of green hydrogen commercialisation framework”. While NMISA does not play a direct role in the described output, it provides measurement capabilities to determine aspects of Green Hydrogen such as purity assignment and thereafter certified reference materials. The importance of purity in this regard not only consider the longevity of the energy systems in which it is used, but also classification as Green Hydrogen. For this reason, certified reference materials are critical and must be considered a core aspect for implementation of the green hydrogen project.

Energy Efficiency: South Africa is developing minimum energy performance standards (MEPS) for lighting products to improve its efficiency and enhance the quality of lighting. In May 2021, the South Africa Development Community Cooperation in Standardisation (SADCSTAN) approved regional lighting regulations. Since LED (Light Emitting Diode) lighting technologies have rapidly replaced all types of conventional light sources and have become less expensive and more accessible over the past 5 years, these regulations aim to transition South African to less energy-intensive lighting products with longer lifespans and lower operational costs. The LED measurement capabilities developed at NMISA will enable regulators to enforce these performance specifications, ensuring that the country’s energy objectives are met and that it does not become a dumping ground for inferior lighting products already prohibited internationally.

Stakeholder Engagement and Impacts: NMISA hosted the Africa Food Safety Workshop in 2018, 2021 (online) and 2022. The next international workshop will be hosted by Egypt in 2024. A number of local stakeholder engagements are planned annually to expand the service offerings of the institute to key stakeholders, including regulators, to support their specific business needs and to expand the impact of the National Measurement Standards realised by NMISA on the economy.

Law Enforcement: An initiative to enhance metrology support to municipalities resulted in agreements with several metropolitans to obtain measurement traceability

for equipment used in traffic law enforcement, including evidential breathalysers and speed-measuring equipment. These services allow the traffic departments of these municipalities to successfully prosecute traffic offenders, thereby enhancing road safety.

Red Tape and State Capability Targets: NMISA is in the final stages of concluding digitalisation of its operational and customer management processes through implementation of Enterprise Resource Planning and Customer Management Systems respectively. Digital solutions are also applied to measurement systems, where applicable, to improve the turn-around times of measurement services to industry.

Public hospitals in the provinces obtain certified reference gas mixtures for medical gases, as well as measurement traceability for oncology treatment from NMISA. Research commissioned by the Competition Commission in the report *Measuring concentration and participation in the South African Economy: Levels and trends*, emphasised the need for structural reforms to reduce economic concentration in certain sectors of the economy and to allow for inclusive growth and enhanced localisation. Prominent levels of concentration by dominant firms make it difficult for SMMEs to enter and stay in the market or to transition into medium or large firms. NMISA supports SMMEs operating at all levels of the value chain: from basic measurements supporting traditional trade (mass and volume) to sophisticated measurement systems supporting leading-edge research and enhancements.

All aspects of modern life are underpinned by metrology: food safety and nutritional content; time, navigation, and accurate positioning; telecommunication; national power supply; medical diagnosis and treatment; safe transport; environmental impact and protection; renewable energy; research and innovation; agriculture; manufacturing; trade; consumer protection; etc. Metrology support for regulators and the consolidation of measurement services for SOEs responsible for these sectors are strategic objectives for NMISA. The institute uses active contractual agreements with other public entities that ensure effective support services, as a key performance measure.

C4.1 TABLE: OUTPUT TARGETS WITHIN THE DTIC-GROUP OF ENTITIES¹

Investment

OUTPUT
R200 billion in investment pledges secured across the state
100 Investor facilitation and unblocking interventions provided
2 new SEZs designated and support work with provinces related to industrial parks

Industrial production

OUTPUT
R40 billion in additional local output committed or achieved
R40 billion in Black Industrialist output achieved

Exports and trade

OUTPUT
R700 billion in manufacturing exports
R300 billion in manufacturing exports to other African countries
R2.5 billion in exports of Global Business Services (GBS)
1 Implementation of the AfCFTA
10 High impact trade interventions completed
4 Protocols finalised under the AfCFTA

Industrial support

OUTPUT
R30 billion in support programmes administered by or in partnership with the dtic group
R15 billion support programmes to enterprises in areas outside the 5 main metros
R8 billion in financial support programmes to SMMEs, and women and youth-empowered businesses
R7.5 billion in financial support programmes to enterprises in labour absorbing sectors
Promotion of a transparent and just adjudication process for incentive applications

Transformation

OUTPUT
R800 Million in Equity Equivalent Investment Programme agreements agreed or administered
20 000 additional workers with shares in their companies
10 high-impact outcomes on addressing market concentration, at sector or firm level.

Jobs

OUTPUT
1 million jobs supported or covered by Master Plans
100 000 jobs to be created (50 000 social economy fund part-time or temporary job opportunities and 50 000 full-time jobs)
23 000 jobs in Black Industrialists firms

¹ Each Programme reports on its contribution to these quantitative targets. These contributions when summed represent the gross value of the target including some degree of duplication and overlap between Programmes. The removal of these results in the above net values for each of the 45 targets.

Energy

OUTPUT
R1.3 billion in financial support to enterprises including SMMEs to mitigate impact of load shedding through energy resilience fund
1400 Megawatts of energy from projects facilitated
550 Megawatts of energy available for the grid
1 Energy One-stop Shop operational
Expedited regulatory amendments and flexibility, to promote energy efficiency

Green economy targets

OUTPUT
1 Strategy and advocacy finalised responding to green non-tariff barriers (Carbon Border Adjustment Mechanism (CBAM))
1 EV Strategy finalised
1 Finalisation of green hydrogen commercialisation framework

Stakeholder engagement and impacts

OUTPUT
10 Business Forums hosted aimed at supporting increased FDI, exports and outward investment.
1000 Case studies of firms, workers, entrepreneurs, professionals or communities impacted by the dtic measures: including 12 local films/documentaries telling the SA story
52 Community outreach programmes by the dtic group
5 Conferences, summits, and international forums hosted
10 Successful actions completed on price monitoring and excessive pricing or price gouging

Addressing crime

OUTPUT
Grey-listing: Publication of 'Know Your Shareholder' Regulations and Follow Ups
1 Metal trading system developed to identify stolen public infrastructure entering the scrap metal value-chain, export market or legitimate metal production industry

Red tape and state capability targets

OUTPUT
4 High-impact measures to improve the efficiency and/or effectiveness, of the dtic's policy or programme interventions
10 High-impact measures to reduce red tape or improve turnaround times in administration of incentives and work of agencies
6 Impact assessments or enhancements of trade instruments or measures

Improving the capacity and responsiveness of the state and social partnership

OUTPUT
4 Pieces of priority legislation amended, tabled or submitted to Executive Authority, Cabinet or Parliament
7 Master Plans managed and 1 new masterplan to be finalised
Oversight of IDC, NEF and ECIC to ensure that at least 95% of planned KPIs are achieved
Oversight of other entities to ensure that at least 95% of planned KPIs are achieved
50 Mergers and acquisitions where public interest conditions have been incorporated

C4.2 CONTRIBUTION BY NMISA TO THE DTIC OUTPUT TARGETS WITHIN THE DTIC-GROUP OF ENTITIES

DTIC OUTCOME	NMISA OUTPUTS	OUTPUT INDICATORS	
Investment			
2 new SEZs designated and support work with provinces related to industrial parks	Collaboration firms within SEZs for the provision of measurement services to enable quality assurance of products manufactured within SEZs	Number of new SOEs and/or companies within SEZs serviced by NMISA <i>(Included in NMISA KPI 7)</i>	
Industrial Production			
R40 bn additional local industrial output committed or achieved	Industry obtains measurement traceability provided by NMISA to demonstrate compliance with regulations, safety and performance standards for products, and to meet import/export requirements	Increased visibility of NMISA through awareness campaigns and marketing activities aimed at the manufacturing, mining and related industries <i>(Included in NMISA KPI 5)</i>	
Exports and Trade			
1 Implementation of the AfCFTA	Support the implementation of the AfCFTA agreement by providing for mutual and international acceptance of measurement and testing results obtained on the African continent. It is achieved through active participation in the activities of regional metrology bodies	Number of interlaboratory comparisons (ILCs) and PTS organised and completed within AFRIMETS <i>(Included in NMISA KPI 15)</i>	
Industrial Support			
R8 billion support programmes for SMMEs, and women and youth-empowered businesses	Develop a support programme specifically for SMMEs to assist them with improving the competitiveness of their products in local and export markets through quality assurance	Number of SMMEs trained or supported by measurement services offered by NMISA	
R15 billion support programmes to enterprises outside the 5 main metros	Extend the reach of the national measurement system to increase support to districts outside the 5 main metros to enable quality assurance of products manufactured within these districts	Number of outreach activities undertaken to further extend measurement services to districts outside the main metros	
Jobs			
100 000 new jobs created through interventions: a. 50 000 job opportunities (not permanent) b. 50 000 full-time permanent jobs	Internal job opportunities created by NMISA through its Internship Programme Successful completion of this programme creates market ready young professionals in STEM fields who are taken up by industry	Number of non- permanent jobs created for the year <i>(Included in NMISA KPI 1)</i>	
Energy			
Expedited regulatory amendments and flexibility to promote energy efficiency	Supporting energy efficiency standards and/or regulations for lighting products through testing services for LED lighting sources. Regulations can only be implemented successfully if the accuracy of measurement and testing results can be relied upon.	Number of stakeholder engagements and publications to improve awareness and uptake of new measurement services for LED sources offered by NMISA	

	ANNUAL TARGETS						
	AUDITED/ACTUAL PERFORMANCE			ESTIMATED PERFORMANCE	MTEF PERIOD		
	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
	N/A (new KPI)	N/A (new KPI)	N/A (new KPI)	N/A (new KPI)	At least 1 new service agreement with a SOE/firm within a SEZ	At least 2 new service agreements with a SOE/firm within a SEZ	At least 3 new service agreements with a SOE/firm within a SEZ
	N/A (new KPI)	N/A (new KPI)	N/A (new KPI)	N/A (new KPI)	At least 1 stakeholder engagement and 1 article published for the manufacturing, mining or related industries	At least 1 stakeholder engagement and 2 articles published for the manufacturing, mining, or related industries	At least 1 stakeholder engagement and 2 articles published for the manufacturing, mining, or related industries
	N/A (new KPI)	N/A (new KPI)	N/A (new KPI)	N/A (new KPI)	2	4	6
	N/A (new KPI)	N/A (new KPI)	N/A (new KPI)	N/A (new KPI)	10	10	10
	N/A (new KPI)	N/A (new KPI)	N/A (new KPI)	N/A (new KPI)	4 outreach activities concluded	6 outreach activities concluded	8 outreach activities concluded
	25 interns hosted	15 interns hosted	31 interns hosted	34 interns hosted	25 interns hosted	20 interns hosted	20 interns hosted
	N/A (new KPI)	N/A (new KPI)	N/A (new KPI)	N/A (new KPI)	At least 1 stakeholder engagement on energy efficiency hosted by NMISA	At least 2 stakeholder engagements on energy efficiency hosted by NMISA plus at least 1 publication in the field	At least 3 stakeholder engagement on energy efficiency hosted by NMISA plus at least 2 publications in the field

DTIC OUTCOME	NMISA OUTPUTS	OUTPUT INDICATORS	
Green Economy Targets			
1 EV Strategy finalised	Support the EV strategy with internationally recognised measurement traceability. Reliable, accurate and traceable electric power measurements are needed for safe and effective inductive charging of EVs, as well as energy billing.	Maintain the National Measurement Standards for Power and Energy <i>(Included in NMISA KPI 13)</i>	
1 Finalisation of green hydrogen commercialisation framework	Support the green hydrogen strategy plan for SA with internationally recognised measurement traceability. A metrological infrastructure is required to address all parts of the supply chain, from manufacturers to consumers. It will allow for the reliable monitoring of gas grids, evaluation of performance, and calibration of sensors for continuous monitoring.	Progress reports on a research and development plan for new measurement standards and/or methods for green hydrogen gas and related products	
Stakeholder Engagement and Impacts			
5 Conference summits and international forums hosted	Participate in the international committees established to enact the Metre Convention Treaty to link the national and regional measurement system internationally, which enables global trade by providing for mutual acceptance of measurement and testing results.	Number of memberships maintained and active participation in the CIPM and Consultative Committees <i>(NMISA KPI 18)</i>	
1000 Case studies of firms, workers, entrepreneurs, professionals, or communities impacted by the dtic measures: including 12 local films/documentaries telling the SA story	Case studies of stakeholders impacted by products or services delivered by NMISA	Number of case studies concluded	
Red Tape and State Capability Targets			
10 High-impact measures to reduce red tape or improve turn-around times in administration of incentives and work of agencies	Digitalisation of operational processes and customer service management to continuously provide optimum time and cost-efficient services to industry.	Number of digital solutions for business systems and/or technical projects implemented to increase operational efficiency and improve client experiences	

	ANNUAL TARGETS						
	AUDITED/ACTUAL PERFORMANCE			ESTIMATED PERFORMANCE	MTEF PERIOD		
	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
	-	-	-	-	Maintain the NMS for Power and Energy in accordance with the Scope of Accreditation	Maintain the NMS for Power and Energy in accordance with the Scope of Accreditation	Maintain the NMS for Power and Energy in accordance with the Scope of Accreditation
	N/A (new KPI)	N/A (new KPI)	N/A (new KPI)	N/A (new KPI)	Report on a feasibility study on metrology services for green hydrogen	Report on 1 new measurement solution of green hydrogen	Report on 1 new/improved measurement solution for green hydrogen
	10	10	10	10	10	10	10
	N/A (new KPI)	N/A (new KPI)	N/A (new KPI)	N/A (new KPI)	20	20	20
	N/A (new KPI)	N/A (new KPI)	N/A (new KPI)	N/A (new KPI)	Implement a digital solution for technical projects	Implement 1 new/improved digital solution to improve operational efficiency	Implement 1 new/improved digital solution to improve operational efficiency

C5 UPDATED KEY RISKS

Table 9: NMISA updated key risks

RISK NAME	RISK CONTROL	RESIDUAL RISK	ACTION PLANS	DUE DATE
Inability to retain key personnel within the organisation	<ul style="list-style-type: none"> NMISA's Talent Pool Remuneration Strategy and Policy (salary benchmarking, annual COLA consideration, Reward and Recognition Policy) Human Capital Development Career Ladder and career progression Employee Wellness Programme International exposure 	10	Review the HR Retention Strategy	30 June 2023
			Undertake the salary survey in line with the Remuneration Policy	31 January 2024
			Employees inducted on NMISA salary structure	31 January 2024
			Finalisation and approval of the Draft Succession Plan	30 May 2023
			Review of HR policies and procedures	30 November 2023
Financial sustainability – revenue generation and collections	<ul style="list-style-type: none"> Revenue Generation Strategy implemented (project streams/ teams for specific projects to be looked into) Appointment of business development, technical salesperson, key accounts manager and marketing and communications Communication with clients with regards to NMISA operations (NMISA website) Management of MoUs and SLAs for the benefit of NMISA Regular follow-ups on all outstanding debtors requesting payments Implementation of ERP to improve management of debtors and requests for quotes Resourced Applied Metrology Division Plan developed, together with the dtic, to engage government departments and their regulators 	15	Stakeholder Engagement Plan developed and implemented	30 June 2023
			Business Development Plan to be developed (benchmark with IDC and DBSA)	30 June 2023
Financial sustainability – declining grant allocation	<ul style="list-style-type: none"> Revenue Generation Strategy Plan developed that outlines resources required (with different entities) together with the dtic to engage regulators 	25	Stakeholder Engagement Plan developed and implemented.	30 June 2023

RISK NAME	RISK CONTROL	RESIDUAL RISK	ACTION PLANS	DUE DATE
Regulators and government laboratories not using NMISA services	<ul style="list-style-type: none"> Marketing of NMISA services and awareness campaigns with regulators to promote awareness and to supply all government departments and SOEs with fit-for-purpose measurement services Marketing Strategy developed and implemented Signing MoUs/MoAs and/or SLAs with regulators 	10	Engagement with the dtic and other TI entities to evaluate the need for revision of the NMISA Act within the quality assurance framework	30 June 2023
			Participation in the dtic review of NMISA Act	30 November 2023
			Review of regulations requiring measurement input for enforcement and strongly propose revision to the responsible regulator and government departments	30 November 2023
			Liaise with the dtic on the possibility of issuing practice notes	30 June 2023
Ineffective business continuity	<ul style="list-style-type: none"> Business Continuity Management Policy Disaster Recovery Team to help manage incidents within the organisation Sustainability reporting ERP implemented on cloud platform and Microsoft assures us 99,99999 % uptime and disaster recovery IT audits Adherence to ISO/IEC 17025:2017, ISO17034, ISO/IEC17043, ISO14001 and ISO 45001 aligned to POPIA External disaster recovery site in place at TERACO (Kempton Park) 	15	Alignment of business continuity management to ISO 27001 and ISO 22301	31 January 2024
			Quarterly disaster recovery testing	Quarterly
Cybersecurity	<ul style="list-style-type: none"> Business Continuity Management Policy in place IT backup offsite storage IT disaster recovery plan aligned with NMISA Business Continuity Management Plan Regular monitoring of virus infections and patch/virus signature management Intrusion prevention and detection system Weekly review of logs from FortiGate and IDS/IPS with monthly sign-off IT team completed the A+ IT Security Course Implemented Microsoft Office M365 with compliance and security Implemented an awareness and training programme for all staff Cloud Strategy implemented Performing regular penetration testing Perform regular vulnerability testing and implement security controls to mitigate vulnerabilities Systems set up to monitor and alert on anomalies on the NMISA network Investigating third-party tools to manage security 	15	Set up demilitarised zones to contain and protect against infection	30 September 2023
			Implement NIST cyber security framework	31 January 2024
			Train the Security Incident Response Team to manage security incidents	30 September 2023
			Develop a POPIA Roadmap for IT	30 April 2023

RISK NAME	RISK CONTROL	RESIDUAL RISK	ACTION PLANS	DUE DATE
Non-compliance to regulations, legislation and NMISA policies and procedures	<ul style="list-style-type: none"> • NMISA policies and procedures and policy reviews updates to treasury notes • Legal department • Legal compliance audit • Audit procedures including self-audits • Combined assurance team training on policies • Adherence to preferential procurement • Employment Equity Committee 	8		
Ineffective governance of the organisation	<ul style="list-style-type: none"> • Notify the shareholder of current or upcoming Board vacancies that may arise within 6 months • Keep and monitor register of Board members' term. • Recommendation of required collective skills for appointed Board members • Board Chairperson, Company Secretary and CEO to initiate the discussion (write to the dtic) on the expiry of the Board term 	15	Empowerment of Board members to provide better oversight	30 August 2023

C6 FRAUD PREVENTION PLAN

NMISA follows a zero-tolerance approach towards fraud and corruption and strives towards maintaining the highest standards of prevention, detection, and remediation. All NMISA employees are expected to be responsible and accountable for ensuring resilient, forceful, and effective fraud control. NMISA is committed to minimising the incidence of fraud through the development, implementation, and regular review of fraud prevention, detection, and responsive activities, as well as through periodic risk assessment exercises.

NMISA's fraud prevention objectives are as follows:

- **Prevention:** Ensuring that the risk is prevented and/or avoided judiciously.
- **Detection:** Ensuring that the risk of fraud is discovered when it occurs, and preventative measures are put in place.
- **Response:** Ensuring that corrective action is taken, and the harm caused by fraud, corruption or misconduct is addressed.

NMISA's fraud prevention plan includes:

- Identify fraud risks, review NMISA's operations, and update the Fraud Prevention Policy every two years or earlier if necessary.
- Provide fraud awareness training to all staff.
- Communicate how suspected instances of fraud may be reported.
- Assign responsibility for an instant response to the occurrence.
- Investigate alleged or suspected instances of fraud and corruption using qualified personnel and professionals with experience in investigative techniques.
- Take appropriate action to deal with instances of actual, suspected, or alleged fraud and corruption, including prosecution of persons and/or organisations for fraud offences where and when appropriate.
- Ensure protection of whistle-blowers.
- Use all avenues to recover funds or property lost through fraudulent activity.
- Ensure the dealings with the media in terms of reported and/or alleged cases are prompt and precise.
- Preserve evidence and report to the police.

C7 MATERIALITY AND SIGNIFICANT FRAMEWORK

C7.1 INTRODUCTION

In terms of Treasury Regulation 28.3.1, Accounting Authorities must “For purpose of ‘material’ [Sections 50(1), 55(2) and 66(1) (c) of the Act] and ‘significant’ [Section 54(2) of the Act], develop and agree a framework of acceptable levels of materiality and significance with the relevant executive authority”.

NMISA is required by law to operate within the PFMA and its accompanying Treasury Regulations as a Schedule 3A public entity, the above-mentioned sections of the Act are therefore very significant for operational and reporting purposes.

C7.2 ASSESSMENT AND DETERMINATION OF MATERIALITY

The materiality of transactions will be assessed from both quantity and quality points of view. Therefore, both the amount (quantity) and nature (quality) of information need to be considered in setting and determining whether the event/matter is material or not.

C7.2.1 Quantitative Materiality

BASIS	GUIDELINE	% USED	RAND VALUE PER 2021/22 ANNUAL REPORT	MATERIALITY AMOUNT
Total Revenue	0,5 % – 1 %	0,5	R288 956 750	R1 444 784
Total Assets	1 % – 2 %	1	R727 107 274	R7 271 072

The basis selected for materiality is total revenue, considering Accounting Authority limits, audit risk, prior years audit findings and professional judgement.

C7.2.2 Qualitative Materiality

Qualitative characteristics that are used by management to assess the materiality of an item include the following:

- Public accountability;
- Compliance with legislation;
- Disclosure requirements;
- Reporting requirements in terms of Section 5 of the Auditor-General’s Act;
- Sensitive situations, including irregularities, illegal and questionable transactions; and
- Importance of information for users.

Management determines the qualitative materiality in line with the quantitative materiality.

C7.3 ASSESSMENT AND DETERMINATION OF SIGNIFICANCE

Quantitative and qualitative factors

Although significance may contain quantitative elements, it may require more qualitative considerations in comparison to materiality. This in turn requires professional judgment and regard for the specific transaction in the context of the entity's business as a whole.

Nature of transaction

In setting a monetary value for significance, it may be practicable to differentiate between the following two types of transactions:

- ***Transactions that are operational in nature, i.e. part of the entity's normal, everyday business.***

For those transactions that are operational in nature a higher significance level is set as these transactions are approved within a very specific framework, i.e. the entity's corporate plan, strategic plan and/or annual budget.

Significance level

For a transaction of this nature that is R8 000 000 and above, the organisation will submit the relevant particulars of the transaction to Accounting Authority for approval.

The organisation will also submit a procurement plan for all procurement that is R1 000 000 and above to the Accounting Authority for approval.

- ***Transactions that are strategic in nature, i.e. outside the entity's normal, everyday business, or transactions that are non-routine or that would impact the business or financial position of the entity as a whole.***

For those transactions that are strategic in nature, a lower significance level is set considering the strategic impact thereof.

Therefore, any transaction, which in the accounting authority's opinion may in any way influence the decisions or actions of the executive authority or the legislature to which the entity is accountable should be seen as significant.

For those transactions that are strategic in nature the entity will calculate separate materiality/significance figures based on:

- the nature of the account balance;
- the nature of the transaction; and
- the aspect of the financial statements being considered.

C7.4 FRAMEWORK OF ACCEPTABLE LEVELS OF MATERIALITY AND SIGNIFICANCE

Materiality and significance levels will be influenced by considerations such as legal and regulatory requirements.

NMISA Materiality and Significance Framework in terms of the Public Finance Management Act and accompanying Treasury Regulations, is detailed in Table 10.

Table 10: NMISA's Materiality and Significance Framework

MATERIAL		
Section 50 (1)	The accounting authority of a public entity must - on request, disclose to the executive authority responsible for the public entity or the legislature to which the public entity is accountable, all material facts, including those reasonably discoverable, which in any way influence the decision or actions of the executive authority or that legislature.	Quantitative – 0,5 % of total revenue Acquisition of assets as listed and approved on the published capital list
Section 55 (2)	The annual report and financial statements must: <ol style="list-style-type: none"> Fairly present the state of affairs of the public entity, its business, its financial results, its performance against predetermined objectives and its financial position as at the end of the financial year concerned. The annual report and financial statement must include particulars of: <ul style="list-style-type: none"> any material losses through criminal conduct and any irregular expenditure and fruitless and wasteful expenditure that occurred during the financial year. Any criminal or disciplinary steps taken as a consequence of such losses or irregular expenditure or fruitless and wasteful expenditure Any losses recovered or written off Any financial assistance received from the state and commitments made by the state on its behalf Any other matters that may be prescribed. Include the financial statements of any subsidiaries. 	Quantitative – 0,5 % of total revenue Any value or qualitative aspect would be considered material All such transactions will be considered material and discussed with the executive authority
Section 66 (1)	An institution to which the PFMA applies may not borrow money or issue a guarantee, indemnity or security, or enter into any other transaction that bind or may bind that institution or the Revenue Fund to any future commitment, unless such borrowing, guarantee, indemnity, security or other transaction is authorized the PFMA; and In the case of public entities, is also authorized by other legislation not in conflict with the PFMA.	All events/transactions will require disclosure – 100 % compliance
SIGNIFICANT		
Section 54 (2)	Before a public entity concludes any of the following transactions, the accounting authority for the public entity must promptly and in writing inform the relevant treasury of the transaction and submit relevant particulars of the transaction to its executive authority for approval of the transaction: <ul style="list-style-type: none"> Establishment or participation in the establishment of a company Participation in a significant partnership, trust, unincorporated joint venture or similar arrangements Acquisition or disposal of a significant shareholding in a company Acquisition or disposal of a significant asset Commencement or cessation of a significant business activity A significant change in the nature or extent of its interest in a significant partnership, trust, unincorporated joint venture or similar arrangement. 	All events/ transactions will require disclosure – 100 % compliance

C8 INFRASTRUCTURE PROJECTS

The NMS and other standards are continually reviewed to ensure that these still meet the needs of the South African industry. Stakeholder engagement takes place during technical advisory forums and participation in national interest forums. Efforts to remain relevant to the increasing needs of industry are, however, moot if NMISA's aging infrastructure challenges are not addressed.

NMISA is located on the CSIR's Scientia Campus. It still occupies the metrology laboratories, as when the CSIR National Metrology Laboratory, the forerunner of NMISA, took occupation of the site in the 1960s. With no major building infrastructure investment in its history, NMISA became a tenant of the premises in 2007. The building infrastructure has reached its technical limit of modifications. Infrastructure-related incidents over the years hamper NMISA's ability to develop new NMS and to maintain and/or improve the existing NMS to levels required by industry, and the institute and its important work are under threat from ageing infrastructure.

In response to this threat, NMISA motivated for a recapitalisation of the NMS and new building infrastructure, and a public-private partnership (PPP) project was registered at National Treasury. The transaction advisor and the project officer were appointed to prepare a feasibility study towards recapitalisation. With the assistance of the PPP unit of National Treasury, a feasibility study was finalised for the best model for the new building infrastructure and

for a sustainable model for the continuous upgrade and maintenance of the NMS.

However, National Treasury did not approve the project to build a metrology institute campus. NMISA engaged with the Department of Public Works to procure the site identified as suitable by the feasibility study but this request was unsuccessful.

With the help of **the dtic**, recapitalisation funds were allocated to address the following urgent needs in lieu of a holistic metrology institute overhaul:

- Procurement of equipment for the modernisation of NMISA to ensure the organisation can keep up with modern technological advances and continues delivering on its mandate while shortening the traceability chain for South Africa and the continent.
- Human capital development to ensure that metrologists are trained on the equipment associated with the technology acquired. NMISA relies heavily on its human capital and this will be even more pronounced with its modernisation.

Addressing these will ensure that NMISA remains able to provide traceability to the SI system in South Africa, facilitating trade and cutting down barriers to trade. This is aligned with NMISA's strategic direction to shorten the traceability chain for Africa and prepares South Africa for participation in the AFCTA. The interventions to be implemented follow.

Table 11: Infrastructure improvements

PROJECT NAME	DIVISION	OUTPUTS	START DATE	COMPLETION DATE	TOTAL COST ESTIMATED	CURRENT YEAR EXPENDITURE
Industrial Metrology lab	Applied Metrology	Industry calibration laboratory and revenue generation	April 2020	March 2024	R900 000	R747 100
Africa Reference Institute	Applied Metrology	Analytical services to support industry for the provision of reference standards	April 2020	March 2024	R415 450	R175 000



PART D

TECHNICAL INDICATOR DESCRIPTIONS



NMISA plays a crucial role in African trade by ensuring that measurement standards are accurate and reliable, promoting harmonisation of standards across borders, and providing technical assistance to other countries. This facilitates trade in food produce and promote economic growth and development in the region.

D1 INDICATOR PROFILES

A summary of performance indicators developed for NMISA appears in Section C3.3, Table 7 with a more detailed overview in the following tables:

Table 12: Performance indicators

NUMBER	INDICATOR DESCRIPTION	STRATEGIC OUTCOME-ORIENTED GOAL
1	Number of interns and in-service trainees hosted	Ensure the effective dissemination of the units and NMS to national and regional laboratories
2	Amount of income generated	
3	Percentage actual expenditure to budget	
4	Number of accredited laboratories and new laboratory accreditations	
5	Percentage increase in visibility of NMISA	Metrology services for government and SOEs
6	Percentage customer satisfaction	
7	Number of new government departments and SOEs serviced by NMISA	
8	Increase in NMISA clients from the private sector	To provide metrology for regulatory purposes
9	Update Measurement Act to support and contribute to national regulation	
10	Percentage funded vacancies	
11	Reduced turnaround times for filling vacancies in line with the approved recruitment plan	
12	Percentage support to the transformation agenda of both South African and African markets	
13	Number of SI base units realised	Shorten the traceability chain for Africa by maintaining the units and NMS at an internationally recognised level
14	Number of new and improved NMS and reference materials and reference methods	
15	Number of ILCs and PTS organised and completed	
16	Number of memberships maintained	Linking the national and regional measurement system internationally
17	Percentage metrological services covered by CMCs	
18	Number of metrologists trained	
19	Number of courses provided	

D1.1 DETAILED INDICATOR DESCRIPTIONS

Indicators were defined according to the *Revised Framework for Strategic Plans and Annual Performance Plans* document, published by National Treasury.

Table 13: NMISA key performance indicators

KPI 1: NUMBER OF INTERNS AND IN-SERVICE TRAINEES HOSTED	
Indicator title (Output)	Number of interns and in-service trainees hosted
Short definition	Number of interns (minimum of six months) and in-service trainees (work integrated learning) period as described by the academic institution, hosted. To provide work experience for graduates in line with their studies and improve their employability. To build pipeline of skilled and competent professionals to address current and future skills needs and transform the organisation
Source/collection of data	Internship contracts, training/work plans, certificates
Method of calculation	Simple count (total number of interns and in-service trainees hosted/trained during the financial year)
Means of verification	Appointment contracts
Assumptions	A skilled, competent, and transformed workforce
Spatial transformation	Not applicable
Calculation type	Non-cumulative
Reporting cycle	Quarterly
Desired performance	Well-trained interns who can be placed in NMISA or other organisations
Indicator responsibility	Human Resources

KPI 2: AMOUNT INCOME GENERATED	
Indicator title (Output)	Income generated through services' dissemination activities
Short definition	Income generated through calibration, services (PTS and reference measurements), sales (CRMs), consultation, research funds and donor projects (REVENUE) excluding interest
Source/collection of data	A report of income is downloadable from NMISA financial system and provided by Finance
Method of calculation	Simple count (revenue in line with GRAP)
Means of verification	Finance report submitted every quarter
Assumptions	Measurement traceability to industry through calibration, measurement services, analysis, consultation, research grants and donor projects
Disaggregation	None
Spatial transformation	None
Calculation type	Cumulative
Reporting cycle	Quarterly
Desired performance	Meet and/or exceed annual financial revenue target for sustainability
Indicator responsibility	EXCO and Finance

KPI 3: PERCENTAGE ACTUAL EXPENDITURE TO BUDGET	
Indicator title (Output)	Actual expenditure to budget
Short definition	Percentage of expenditure of the budget allocated by the dtic , expensed and committed. Establish financial systems and processes to ensure compliance with regulatory frameworks
Source/collection of data	Statement of financial performance and other financial reports
Method of calculation	Actual spending including commitments/income received
Means of verification	Finance report
Assumption	Established systems and processes to ensure compliance with regulatory frameworks (PFMA)
Disaggregation	None
Spatial transformation	Not applicable
Calculation type	Non-cumulative
Reporting cycle	Quarterly
Desired performance	Full compliance with regulatory frameworks and unqualified audit report
Indicator responsibility	CFO, together with EXCO

KPI 4: NUMBER OF ACCREDITED LABORATORIES AND NEW LABORATORY ACCREDITATIONS

Indicator title (Output)	Number of accredited laboratories and new laboratory accreditations
Short definition	Activities to support maintenance of the total quality management system at an internationally acceptable level (peer-reviewed quality system), peer review for new accredited quality management system. Maintained and new accreditations
Source/collection of data	Confirmation of continued accreditation or peer-review reports or recommendation reports (conditional and unconditional), schedule of accreditation or certificate of accreditation
Method of calculation	Simple count
Means of verification	Certificates, peer-review reports or schedule of accreditation
Assumptions	Quality assurance requirement for NMISA
Disaggregation	New accreditations captured on project proposals
Spatial transformation	Not applicable
Calculation type	Non-cumulative
Reporting cycle	Quarterly
Desired performance	Maintained total quality management system and maintained schedule of accreditation or self-declared parameters under the CIPM Mutual Recognition Arrangement (MRA)
Indicator responsibility	SHEQ

KPI 5: PERCENTAGE INCREASE IN VISIBILITY OF NMISA

Indicator title (Output)	Increase visibility of NMISA in South Africa and the region
Short definition	To increase the visibility of NMISA in South Africa and the region through effective marketing and communication initiatives that increase brand awareness, support strategy, and communicate the measurement solutions we provide and the role of metrology in industry
Source/collection of data	Statistical report showing progress throughout the quarters
Method of calculation	<ol style="list-style-type: none"> Using Advertising Value Equivalence (AVE) calculations done by a contracted service provider, to quantify the total reach of print, online and broadcast media in rand value, plus Using official statistics generated by the NMISA social media platform reports to calculate member growth and audience reach
Means of verification	Independently obtained AVE reports and social media analytics obtained from official reports from social media platforms
Assumptions	Increased visibility of the organisation
Disaggregation	5 % increase in AVE plus 5 % increase in social media reach
Calculation type	Cumulative
Reporting cycle	Quarterly
Desired performance	Increase visibility by 10 % of NMISA to our stakeholders
Indicator responsibility	Marketing and Communications

KPI 6: PERCENTAGE CUSTOMER SATISFACTION

Indicator title (Output)	Percentage customer satisfaction
Short definition	Percentage of customer complaints against all service jobs. To provide industry with a sense of ownership and confidence in NMISA measurements by providing a superior service. NMISA strives for less than 5 % customer complaints
Source/collection of data	Report on the review of customer complaints taken from the quality system (Customer Action Requests)
Method of calculation	Number of customer complaints per quarter/total jobs per quarter
Means of verification	List of invoices/jobs done from finance/number of customer complaints
Assumptions	External client satisfaction
Disaggregation	None
Calculation type	Non-cumulative
Reporting cycle	Quarterly
Desired performance	Zero customer complaints are ideal; any customer complaints received to be timeously addressed and cleared satisfactorily
Indicator responsibility	SHEQ with Key Accounts Officer

KPI 7: NUMBER OF NEW GOVERNMENT DEPARTMENTS AND SOEs SERVICED BY NMISA	
Indicator title (Output)	Metrology service provider for government services and SOEs
Short definition	NMISA providing metrology related services to government and/or SOEs
Source/collection of data	Service level agreements/contracts/contracts through CMS (accepted quotations, once off or for one year or more)/bid acceptance letter/response to unsolicited bids
Method of calculation	Simple count
Means of verification	Signed contracts/SLAs (accepted quotations)
Assumption	Consolidation of metrological services in government and SOEs to save costs
Disaggregation	Not including MoUs
Spatial transformation	Not applicable
Calculation type	Cumulative
Reporting cycle	Annually
Desired performance	Saving government costs by creating effectiveness and sustainability of the NMISA
Indicator responsibility	Business Development with all divisions

KPI 8: INCREASE IN NUMBER OF NMISA CLIENTS FROM THE PRIVATE SECTOR	
Indicator title (Output)	Number of private companies serviced by NMISA
Short definition	NMISA providing metrology related services to non-government entities
Source/collection of data	Service level agreements/contracts/contracts through CMS (accepted quotations, once off or for one year or more)/bid acceptance letter/response to unsolicited bids
Method of calculation	Simple count
Means of verification	Signed contracts/SLAs/CMS reports on client services
Assumption	NMISA sustainability
Disaggregation	Non-government excluding foreign governments
Spatial transformation	Not applicable
Calculation type	Cumulative
Reporting cycle	Annually
Desired performance	Increased revenue generation
Indicator responsibility	Business Development with all divisions

KPI 9: UPDATE OF THE MEASUREMENT ACT	
Indicator title (Output)	Revised Measurement Act to support and contribute to national regulation
Short definition	The participation of NMISA in the technical infrastructure review geared towards the revision of the Measurement Act to support regulation
Purpose/importance	NMISA provides traceability to the international measurement system (the SI) for the protection of the state by ensuring accurate measurements within the country and region
Source of data	Reports and/or minutes of the meetings held
Method of calculation/assessment	Reviewed Measurement Act
Means of verification	Communication between the dtic and NMISA on progress either via email, minutes or reports, proof of submission to the Board
Assumptions	The revised Measurement Act will ensure that industry, government and SOEs use the services of NMISA as an entity developed to support the country
Disaggregation of beneficiaries (where applicable)	No disaggregation
Spatial transformation (where applicable)	Not applicable
Calculation type	Non-cumulative
Reporting cycle	Quarterly
Desired performance	Amendment of the Measurement Act
Indicator responsibility	Directors; RIID and SBDG

KPI 10: PERCENTAGE FUNDED VACANCIES	
Indicator title (Output)	Percentage funded vacancies
Short definition	Percentage of Board-approved vacancies filled by the organisation
Purpose/importance	To address the skills shortage in the organisation and to ensure that core functions or vacancies are filled
Source of data	Accepted role descriptions, Board-approved organisational structure and approved budget
Method of calculation/assessment	Simple count, total number of funded vacant positions filled/total number of funded positions on the approved organisational structure
Means of verification	Signed role descriptions
Assumptions	NMISA sustainability
Disaggregation of beneficiaries (where applicable)	Equity appointments (people living with disability and previously disadvantaged groups)
Spatial transformation (where applicable)	Not applicable
Calculation type	Non-cumulative
Reporting cycle	Quarterly
Desired performance	All funded vacancies filled
Indicator responsibility	Directors Corporate Service

KPI 11: REDUCED TURNAROUND TIMES FOR FILLING VACANCIES IN LINE WITH THE APPROVED RECRUITMENT PLAN	
Indicator title (Output)	Reduced turnaround times for filling vacancies in line with the approved recruitment plan
Short definition	Reduced time to hire new employees and/or filling vacant/resignation posts in days
Purpose/importance	To reduce the turnaround time that it takes for the HR department and recruiting areas to fill vacant positions approved by the Board
Source of data	HR recruitment plan
Method of calculation/assessment	Simple count, number of vacancies filled per quarter
Means of verification	Staff changes report indicating new appointments and signed acceptance letter/appointed letter, approved request to recruit
Assumptions	NMISA turnaround times on recruitment of professionals will be reduced
Disaggregation of beneficiaries (where applicable)	Recruitment per quarter as per section needs
Spatial transformation (where applicable)	Not applicable
Calculation type	Cumulative
Reporting cycle	Quarterly
Desired performance	All funded vacancies filled
Indicator responsibility	Directors Corporate Service and Human Resources

KPI 12: PERCENTAGE SUPPORT TO THE TRANSFORMATION AGENDA OF BOTH SOUTH AFRICAN AND AFRICAN MARKETS

Indicator title (Output)	NMISA support to the transformation agenda of both South Africa and African markets
Short definition	A percentage of NMISA transactions for training received and services provided by suppliers contributing to the transformation agenda for local businesses, and in support of the AfCFTA
Purpose/importance	To support localisation, and building a capable state
Source of data	Transaction report for training or other supplier services provided to NMISA by local and African companies
Method of calculation/assessment	Calculated as the percentage of the total value of training and supplier service transactions by local and African companies to NMISA, against the total value of services procured by NMISA
Means of verification	Summary reports showing the list of local and regional companies
Assumptions	A local agency that imports products from an overseas OEM is regarded as a local supplier
Disaggregation of beneficiaries (where applicable)	EMEs and SMMEs can benefit from NMISA training programmes and other supplier/enterprise development initiatives
Spatial transformation (where applicable)	Services procured need not only include the main metropolitan areas
Calculation type	Cumulative
Reporting cycle	Quarterly
Desired performance	Increased take up of local suppliers through support by NMISA for transformation in South Africa and Africa. This supports the objective of African countries to be more self-sustainable and less reliant on international supply chains
Indicator responsibility	CFO, Director: Applied Metrology, Technical Directors

KPI 13: NUMBER OF SI BASE UNITS REALISED

Indicator title (Output)	Realisation of the SI base units
Short definition	Realisation of the 6 base SI units: Mass, Time, Length, Candela, Kelvin, and Ampere. Phase in new primary methods as these become available
Source of data	Plans for the development in terms of the revision and/or realisation of the SI, quarterly progress reports on the 6 base units
Method of calculation/assessment	Simple count
Means of verification	Reports or maintenance certificates
Assumptions	Equivalence to international standards, implementation of the revised SI
Disaggregation	None
Spatial transformation	Not applicable
Calculation type	Cumulative
Reporting cycle	Quarterly
Desired performance	The South African measurement units need to be equivalent internationally
Indicator responsibility	Directors Physical and Electrical Metrology division

KPI 14: NUMBER OF NEW AND IMPROVED NMS AND REFERENCE MATERIALS AND REFERENCE METHODS

Indicator title (Output)	New and improved NMS and reference materials and reference methods
Short definition	The number of new and improved NMS, reference methods and reference materials developed. NMISA will develop and/or improve NMS for clients or industry. The NMS do not necessarily increase each year, the organisation maintains and applies what has already been developed
Source/collection of data	New NMS, improved NMS and/or procedure/method validation report; reference materials, measurements register and validation report/procedure
Method of calculation	Simple count
Means of verification	Verification/validation report, procedures, NMI report, measurement register
Assumption	Implementation of the revised SI including NMISA adhering to legislative requirements
Disaggregation	None
Spatial transformation	Not applicable
Calculation type	Cumulative year end
Reporting cycle	Quarterly
Desired performance	Does not necessarily increase from year to year. This indicator is in response to periodic industry requirements for CRMs and reference methods to be developed and for NMS to be improved (expansion of NMISA offerings, extending the range)
Indicator responsibility	Technical divisions

KPI 15: NUMBER OF ILCs AND PTS ORGANISED AND COMPLETED

Indicator title (Output)	Number of ILCs and PTS organised by NMISA
Short definition	Interlaboratory comparisons (ILCs) or Proficiency Testing Scheme (PTS) initiated and administered by NMISA. To assist national and regional laboratories in providing confidence in their measurement capabilities. The ILCs and PTS can run over several financial years. Capacity building, safety, and quality assurance
Source/collection of data	Project plans, progress reports and/or final reports (draft A, B, and final report)
Method of calculation	Simple count
Means of verification	Submission of project plans, protocols, progress reports and/or draft A, B, and final reports
Assumptions	Accuracy and confidence in measurement results for South Africa and the region
Disaggregation	None
Spatial transformation	Detailed plans and reports
Type of indicator	Output
Calculation type	Cumulative
New indicator	Yes
Reporting cycle	Quarterly
Desired performance	To build capability in identified parameters
Indicator responsibility	Technical divisions

KPI 16: NUMBER OF MEMBERSHIPS MAINTAINED	
Indicator title (Output)	Number of memberships maintained
Short definition	Maintain membership of, and active participation in, the CIPM and its consultative committees. The work done in the related committees feeds into the CIPM MRA
Source/collection of data	Membership of the committees and CIPM as listed on the BIPM website; appointment and invitation to the measurement treaties for participation and/or country reports
Method of calculation	Simple count
Means of verification	Confirmation of NMISA's membership as listed on the BIPM website
Assumptions	Membership of the 10 CCs and participation in the CIPM and link to the international system of units
Disaggregation	None
Spatial transformation	Not applicable
Calculation type	Non-cumulative
Reporting cycle	Quarterly
Desired performance	Active participation in international committees to ensure NMISA's adherence to international standards and impact policy decisions
Indicator responsibility	RIRI

KPI 17: PERCENTAGE METROLOGICAL SERVICES COVERED BY CALIBRATION AND MEASUREMENT CAPABILITIES (CMCs)	
Indicator title (Output)	Percentage of Metrological services covered by calibration and measurement capabilities (CMCs)
Short definition	To determine the percentage of services offered by NMISA that are covered by CMCs in the KCDB A measurement capability claim that has been reviewed and accepted by international peers, and then published in the BIPM international metrology database (KCDB, Appendix C). Provides stakeholders with confidence that a claimed measurement capability is internationally accepted and internationally equivalent
Source/collection of data	SHEQ report showing the number of CMCs in Appendix C of the international (BIPM) key comparison database (KCDB), published at www.bipm.org , NMISA scopes of accreditation and calibration certificates
Method of calculation	Number of services linked to the official number of active CMCs published in the KCDB for South Africa as of 31 March (screen print and date); simple calculation
Means of verification	Spreadsheet with Schedule of Accreditation and CMCs
Assumptions	Claimed equivalent measurement capability which is internationally acceptable and equivalent
Disaggregation	None
Spatial transformation	Not applicable
Calculation type	Cumulative
Reporting cycle	Annually
Desired performance	Capabilities that meet stakeholder needs
Indicator responsibility	Director RIRI together with SHEQ

KPI 18: NUMBER OF METROLOGISTS TRAINED	
Indicator title (Output)	Number of metrologists trained in accurate measurement in a specific field of metrology
Short definition	Practical/hand-on training of metrologists (external) to ensure knowledge transfer to industry, laboratories and other NMIs. To develop skills and competencies required to provide essential measurement support to industry, laboratories and other NMIs. Training can be provided at the NMISA or other laboratories
Source/collection of data	NMISA Certificate of Training and/or an official report
Method of calculation	Simple count (people)
Means of verification	Certificates/ attendance register
Assumptions	Knowledge transfer to industry and regional NMIs
Disaggregation	Not half day, not internal metrologists
Spatial transformation	Not applicable
Calculation type	Cumulative
Reporting cycle	Quarterly
Desired performance	Capacity building for the region as mandated by the Measurement Act
Indicator responsibility	AMD – training centre with technical divisions

KPI 19: NUMBER OF COURSES PROVIDED	
Indicator title (Output)	Number of courses presented to industry, SMMEs, and other institutes
Short definition	Theoretical courses presented to develop skills and competencies required to provide essential measurement support to industry, SMMEs, and other institutes/laboratories
Source/collection of data	Official signed attendance list of participants attending the course or workshop given or letter from institute hosting course
Method of calculation	Simple count (number of courses presented as per independent attendance registers)
Means of verification	Attendance registers or letters from host institute
Assumption	The application of the science of measurement
Disaggregation	Theoretical courses, courses presented by NMISA staff
Spatial transformation	Not applicable
Calculation type	Cumulative
Reporting cycle	Quarterly
Desired performance	Increased industry training and SMMEs trained in support of the quality infrastructure
Indicator responsibility	Director Applied Metrology Division (training centre) with support from all the divisions



NMISA plays a fundamental role in supporting radiation protection by providing accurate measurements of radiation levels and ensuring that the risks associated with radiation exposure are properly assessed and controlled.

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