nmisa
National Metrology Institute of South Africa

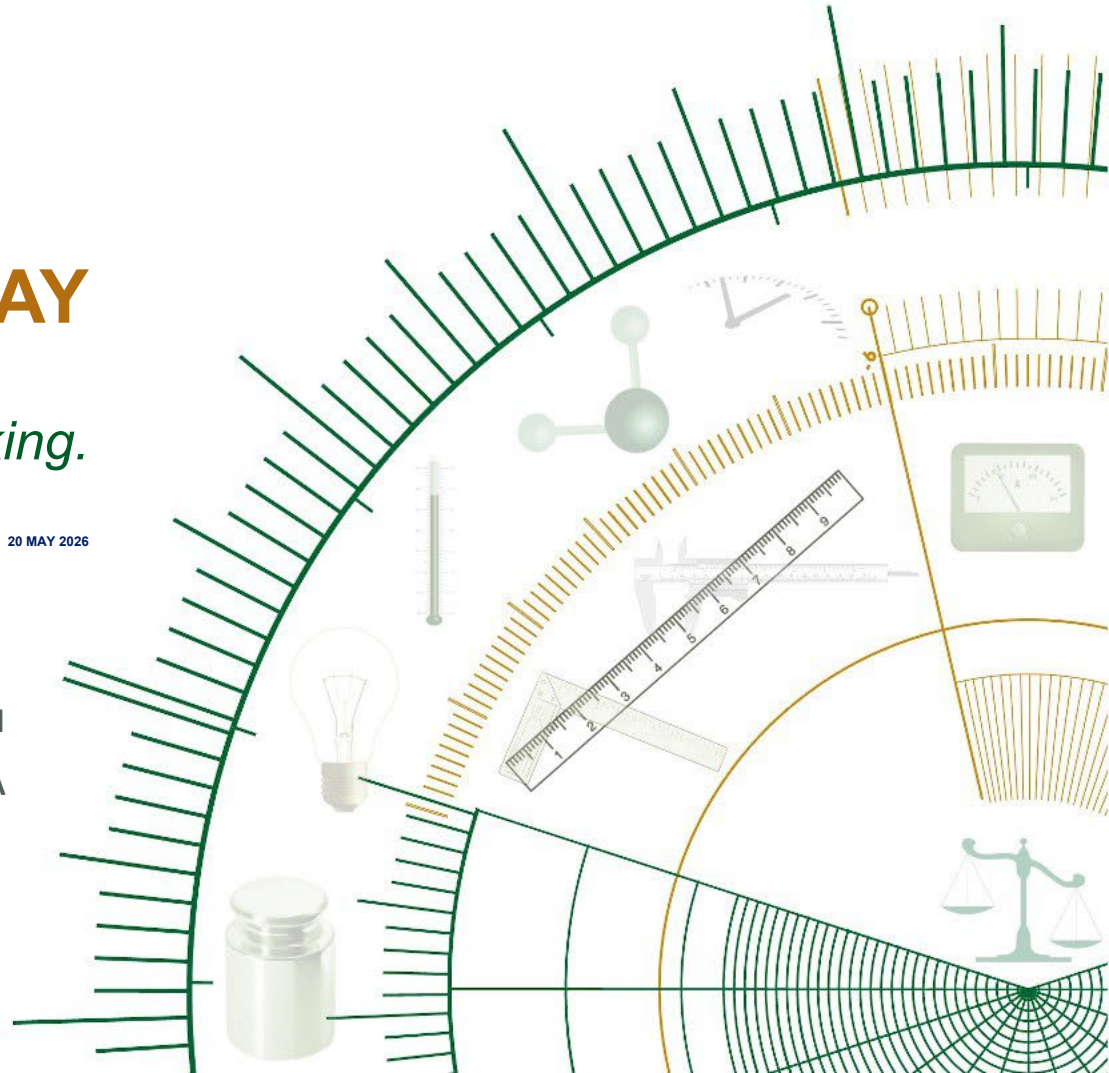
the dtic
Department:
Trade, Industry and Competition
REPUBLIC OF SOUTH AFRICA

NMISA AT A GLANCE

WORLD METROLOGY DAY

Theme: *Metrology: Building Trust in Policy Making.*

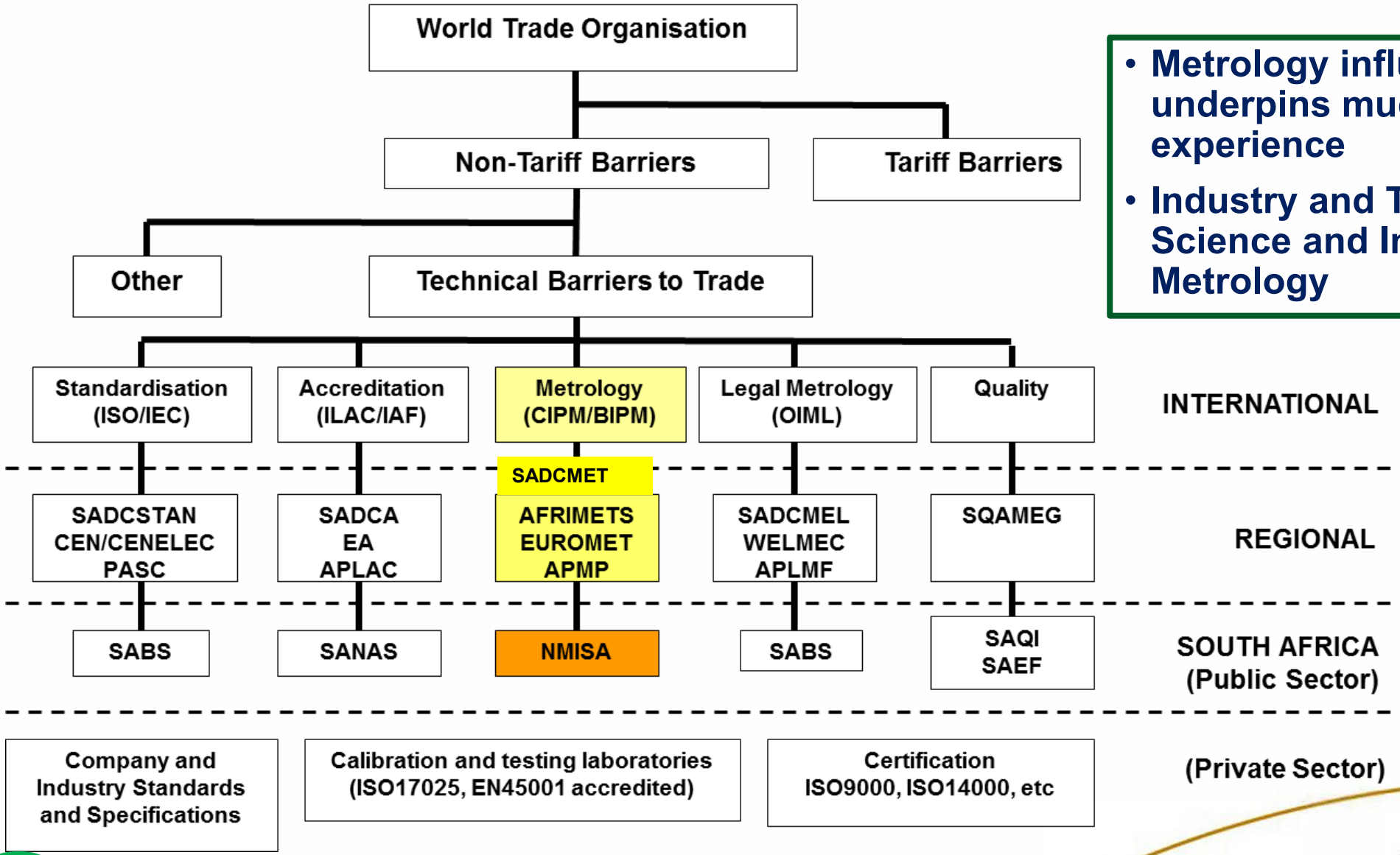
20 MAY 2026



Dr. Mbulelo Nokwequ
CEO - NMISA

Your measure of excellence

The Role of Metrology: Science of Measurement



- Metrology influences, drives, and underpins much of what we do and experience
- Industry and Trade, Quality of Life, Science and Innovation - all rely on Metrology

MANDATE OVERVIEW

The National Metrology Institute of South Africa (NMISA) is mandated by the ***Measurement Units and Measurement Standards Act (Act No. 18 of 2006)*** to:

- **Maintain and disseminate National Measurement Standards (NMS)**
- **Ensure traceability to the International System of Units (SI)**
- **Support regulatory compliance, trade, public health, safety, and environmental protection**

Vision

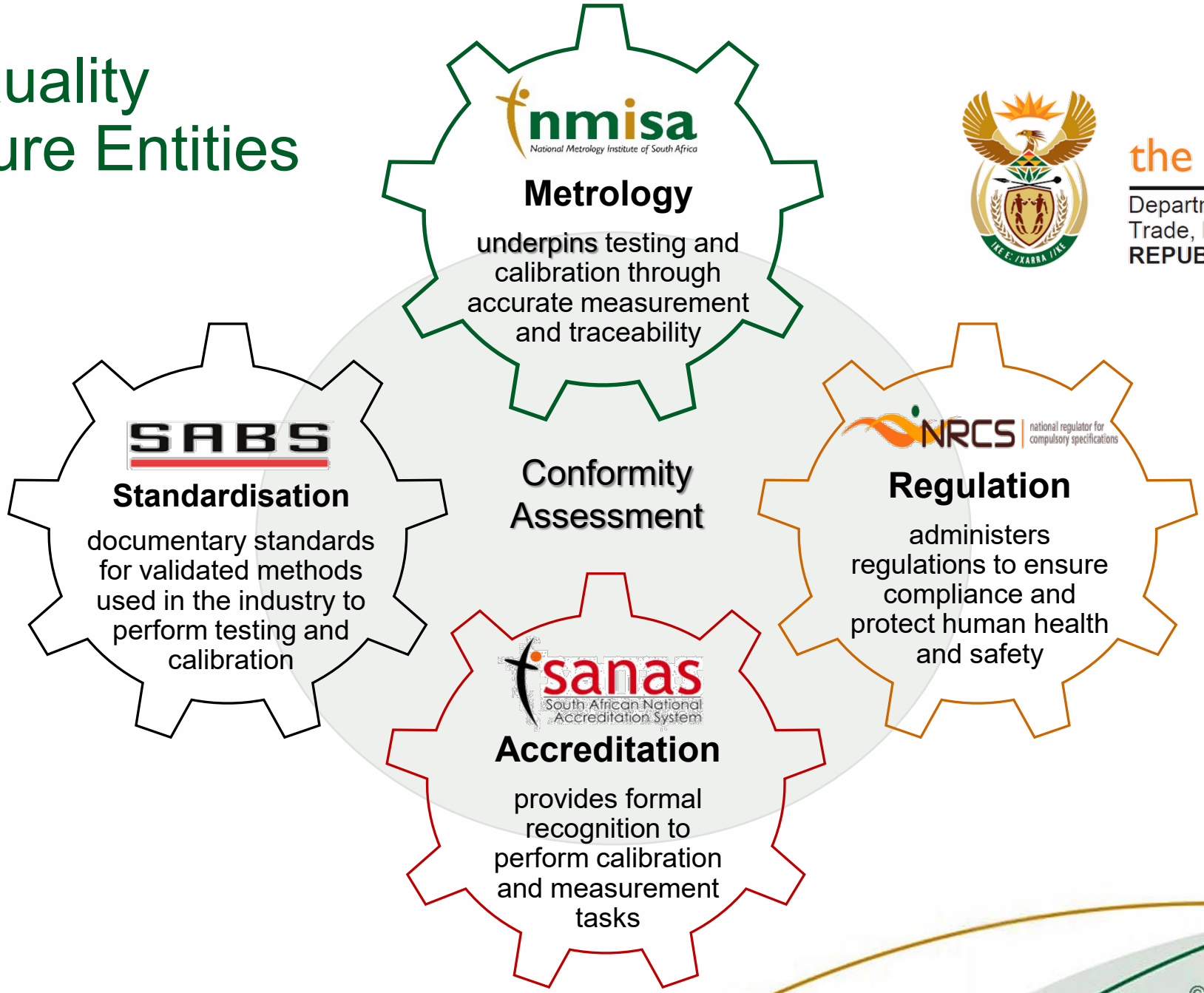
To be a regional and global leader in providing internationally accepted measurement systems that enable market access for our clients and enhance the quality of life for all South Africans.

Mission

To consistently deliver innovative and internationally accepted measurement systems that support regional and international trade, and people's quality of life, and enable the protection of the environment through

- development and implementation of cutting-edge metrology science and technology,
- harnessing regional and international partnerships and collaborations,
- proving environmentally sustainable solutions to its clients,
- a resilient and transformative organization that prioritizes human capital development.

National Quality Infrastructure Entities (NQI)

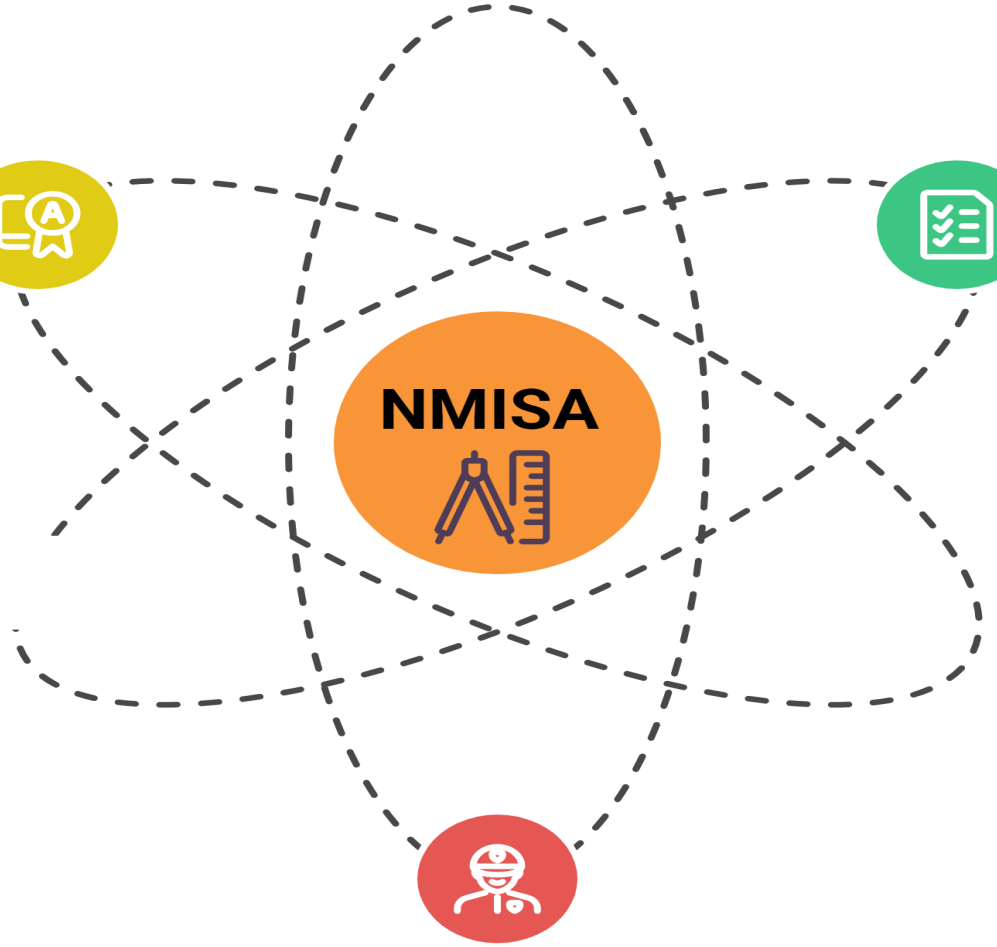


nmisa
National Metrology Institute of South Africa

the dtic
Department:
Trade, Industry and Competition
REPUBLIC OF SOUTH AFRICA

Strengthening Technical Infrastructure and Regulatory Compliance

NMISA underpins Standards, Regulation and Accreditation required for testing and calibration through accurate measurement and traceability



SANAS

provides formal recognition to perform calibration and measurement tasks create an image for this text

SABS

documentary standards for validated methods used in the industry to perform testing and calibration

NRCS

administers regulations to ensure compliance and protect human health and safety

What is a National Measurement Standard?

It is the most accurate reliable reference for a specific measurement country, like a "master or "gold standard.

Why do factories need a trusted reference for measurements?

To ensure their scales ar correct, like how NMISA provides the most precis weight standard for weig gold.

How does NMISA help thermometer manufacturers?

NMISA maintains the o temperature reference verify the accuracy of th devices.

Why are these standards linked to the International System of Units (SI)?

To ensure South Africa' measurements match t used globally, which is critical for fair trade, scientific research, healthcare, and industry.

Ensuring Precision and Compliance Through National Measurement Standards

National Measurement Standards

Develop, maintain, and disseminate NMS aligned with the SI to support economic and regulatory frameworks.

Economic Support

By ensuring reliable and standardised measurements, NMISA facilitates fair trade, industrial development, and compliance with international market requirements.

Accurate Measurements

NMISA provides internationally recognised measurement standards to ensure accurate and traceable measurements across all industries in South Africa.

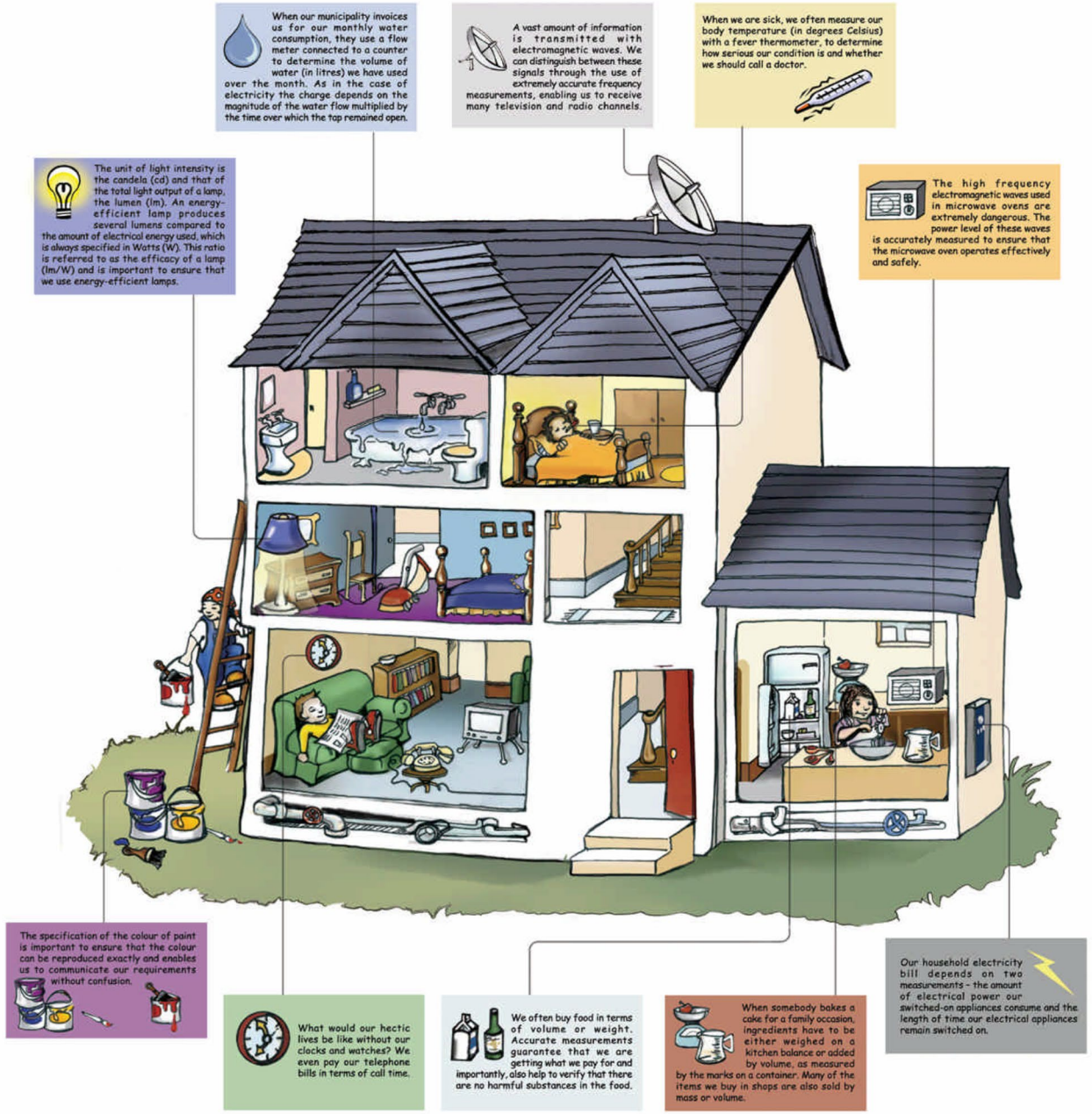
Scientific Development

Develop primary scientific standards for physical and chemical measurements to support research and innovation.

Regulatory Compliance

NMISA supports regulatory enforcement by providing accurate measurement standards, with its results legally recognised in South African courts.

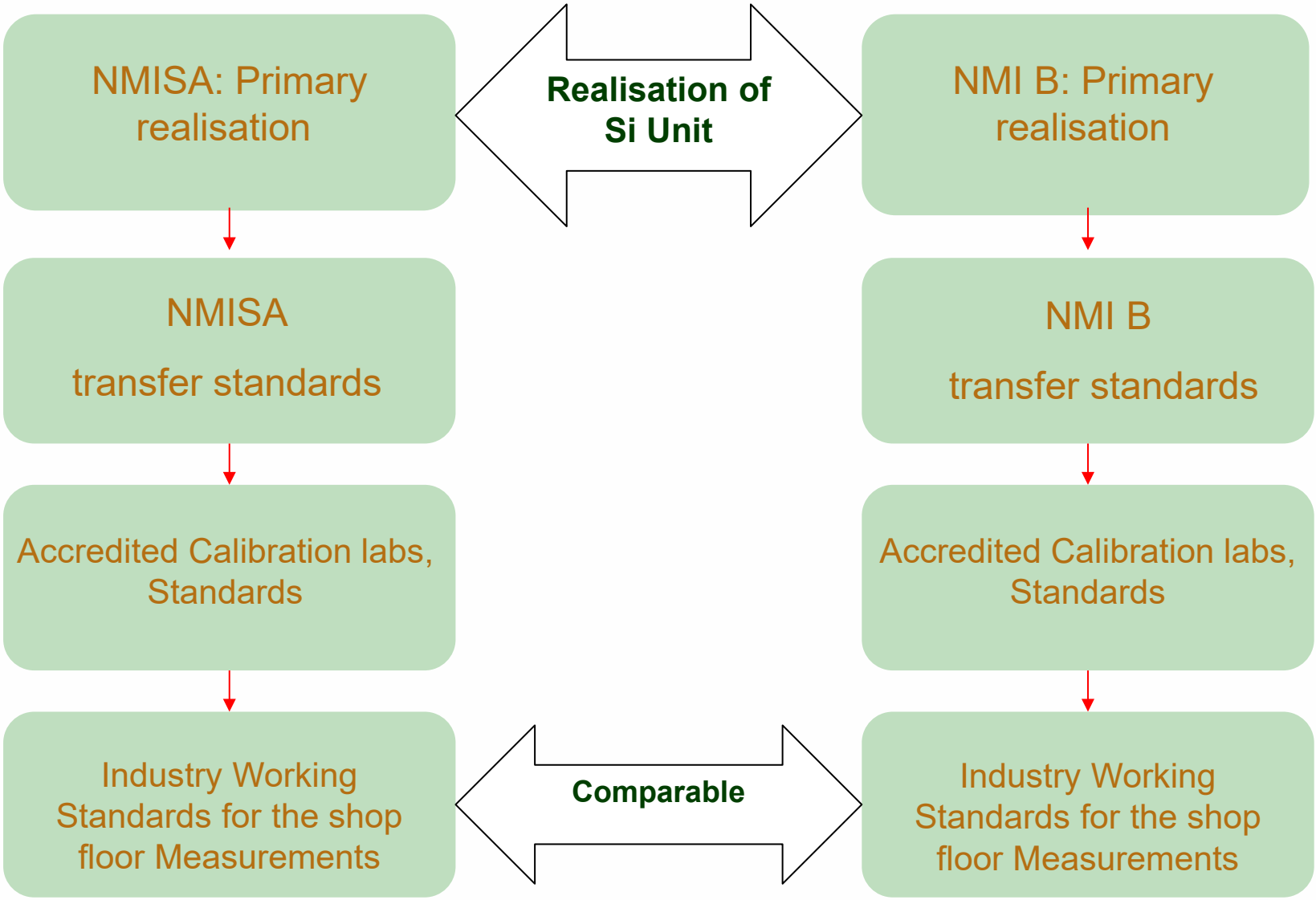
NMISA AT A GLANCE



Accurate Measurement in your home

Thermometer for fever	Products purchased	DB Board for power consumption
Kitchen scale for baking	Clocks and watches	Colour of Paint
Power in Watts - lighting	Water consumption	Frequency measurement

The Role of an NMI



Measurement equivalence has now been achieved between South Africa and Country B!

NMISA Programmes aligned with the dtic outcomes

Material Science and Services

- Materials Characterisation
- Advanced Materials Development
- Materials Property Testing

Agriculture, Food and Environmental Monitoring

- Food and Feed Safety and Labelling
- Environmental Monitoring and Waste Management
- Agricultural Production and Processing
- Pharmaceuticals and Cosmetics
- Earth Observation

Health and Safety

- Medical Instruments and Devices
- Radiation Safety and laboratory medicine
- Air, Surface and Water Disinfection
- Medical Gasses
- Safety

Digital Economy

- Standard Frequencies and Time Signals
- Telecommunication Metrology

Conformity Assessment Support

- PT Schemes
- Reference Materials and Standards Production
- Production and High Technology Centre

Training and Knowledge Services

- Training Short Courses
- Training Programmes
- Consultancy and Strategic Liaisons

Energy Efficiency

- Energy Efficient Lighting
- Liquid Natural Gas
- Renewable Energy
- Smart Grid Metrology

Law Enforcement

- Forensic Metrology
- Road Safety
- Consumer Protection

Physical and Electrical Laboratories

Quantum Technologies

Time and Light

- Time and Frequency
- Fibre Optics
- Radiometry
- Photometry
- Quantum Standards

Temperature and Electrical

- Temperature and Humidity
- Direct Current Low Frequency
- Radio Frequency

Mechanical and Engineering

Metre and Engineering

- Vibration
- Length, (dimensional & coordinate measuring machines)

Mass and Mechanical

- Mass, Volume & Density
- Gas Flow
- Pressure and Vacuum
- Force & Torque
- Acoustics and Ultrasound

Chemistry, Materials and Medical Laboratories

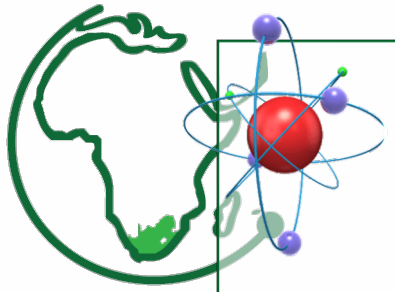
Analytical & Material Sciences

- Inorganic Chemistry
- Organic Chemistry
- Gas
- Surface Analysis
- Materials Characterisation
- Nano-Metrology

BioMedical Sciences

- Radioactivity
- Dosimetry
- Bioscience
- Audit programme

Africa Reference Institute

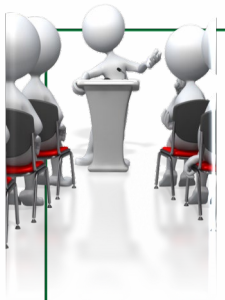


NMISA has invested extensively in the Scientific Metrology fundamentals

NMISA's strategy is focusing more on streamlining the applied metrology impact of its products and services

Hence the establishment of an Institute, comprising specialised *Centres* that will focus nationally and regionally (a gateway) – into Africa and beyond

The Institute will support production and promote the dissemination of quality assurance tools and services through its workshops



Training in best practices and enhancing the fundamentals of metrology and the sciences will be a key focus

The reference measurement and Industry calibration laboratories will provide services aligned with business development opportunities

ARI Ref Meas. Laboratory: new accredited services

NMISA Essential Oil Testing Services

NMISA Organic Analysis Laboratory is ISO/IEC 17025 accredited for testing essential oils. The tests are carried out in accordance with international essential oil testing standards.

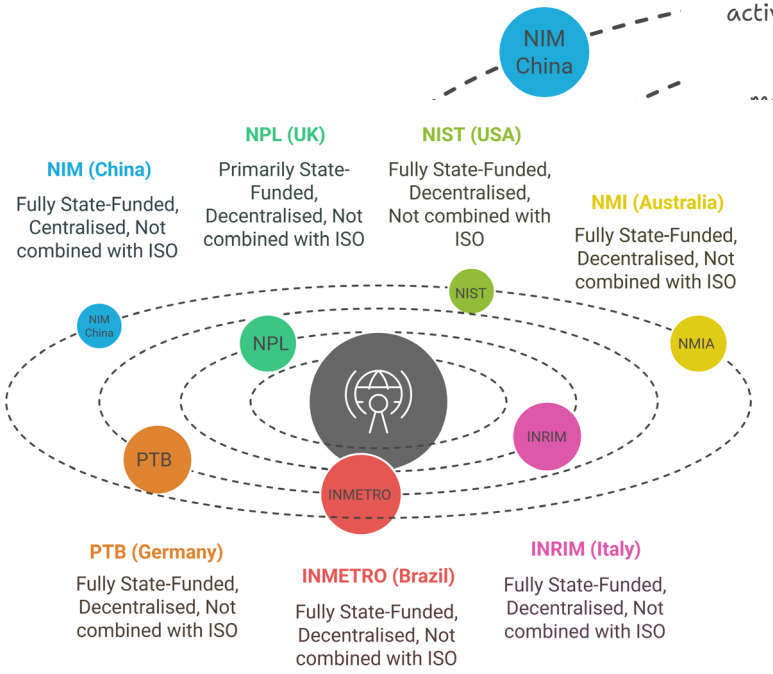
The tests are conducted to assure the purity, authenticity, and overall quality of the essential oils.

	Test Description
ISO 279	Essential oils – Determination of relative density at 20°C – Reference method
ISO 280	Essential oils – Determination of refractive index
ISO 592	Essential oils – Determination of optical rotation
ISO 1242	Essential oils – Determination of acid value
ISO 875	Essential oils – Determination of miscibility in ethanol
ISO 7609	Analysis by Gas Chromatography on capillary column (GC-FID and/or GC-MS component table 15-20)

Training Centre (Metrology Hub)

- The establishment of the **TC** is to serve as an aggregator between government, academia, and Industry – a gateway to skills improvement and application
- Providing training in measurement science, calibration, and consultancy in those fields critical to economic growth in South Africa and our partner countries regionally
- The NMISA **TC** provides both **theoretical and practical** (hands-on) training
- Theoretical training is available from basic to advanced training. It is conducted, **on-site** and/or **online** as well as **self-study courses,** provided by experts in the field, in all aspects of metrology (the science of measurement) and in 'Separation Science'
- **Vision: To be one of the leading training providers on all aspects related to measurement science on the continent**

The Metrology Economic Cycle: Multiplier Effect



Reinvest in NMISA

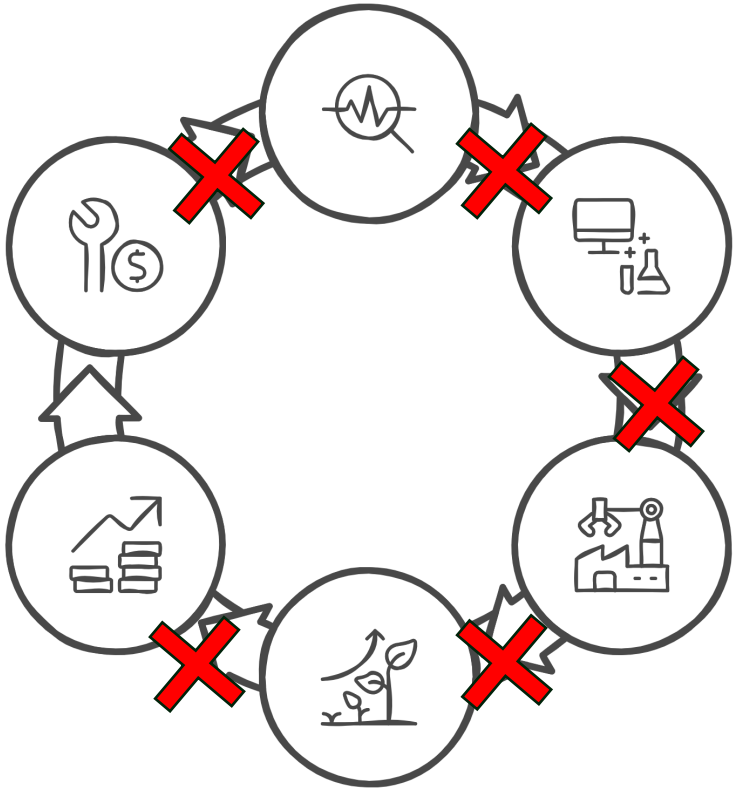
Increased business activities generate more revenue and taxes which fund further metrology investment.

Economic Growth

nomic growth leads higher employment, ages, and consumer spending.

Expand Metrology Services

DTIC invests in NMISA to expand its metrology services.



Support Private Labs

Private calibration labs benefit from the decentralised services, allowing them to serve more of industry needs.

Industry Calibration

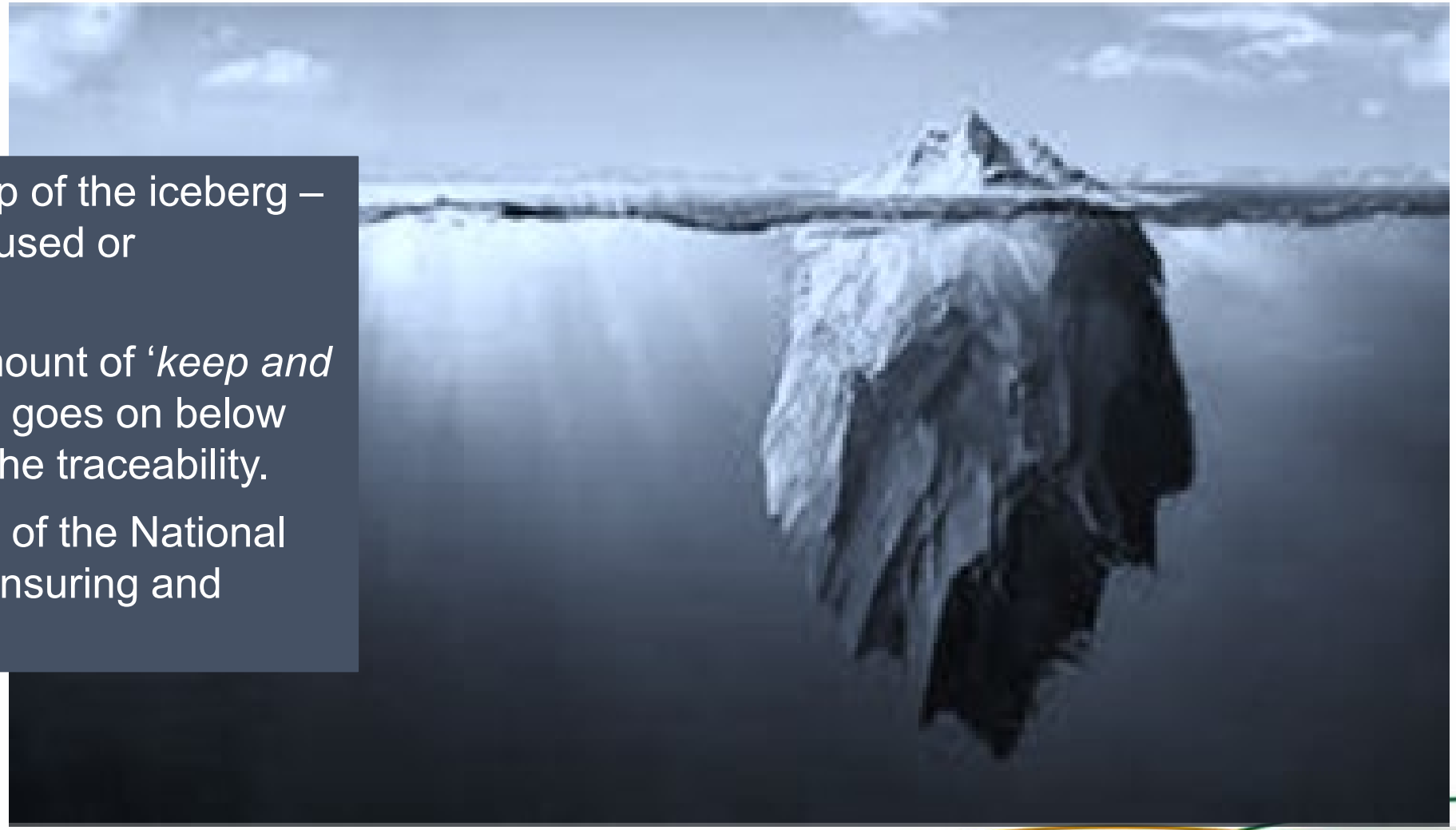
Industry relies on calibrated instruments for quality control, boosting productivity and exports.

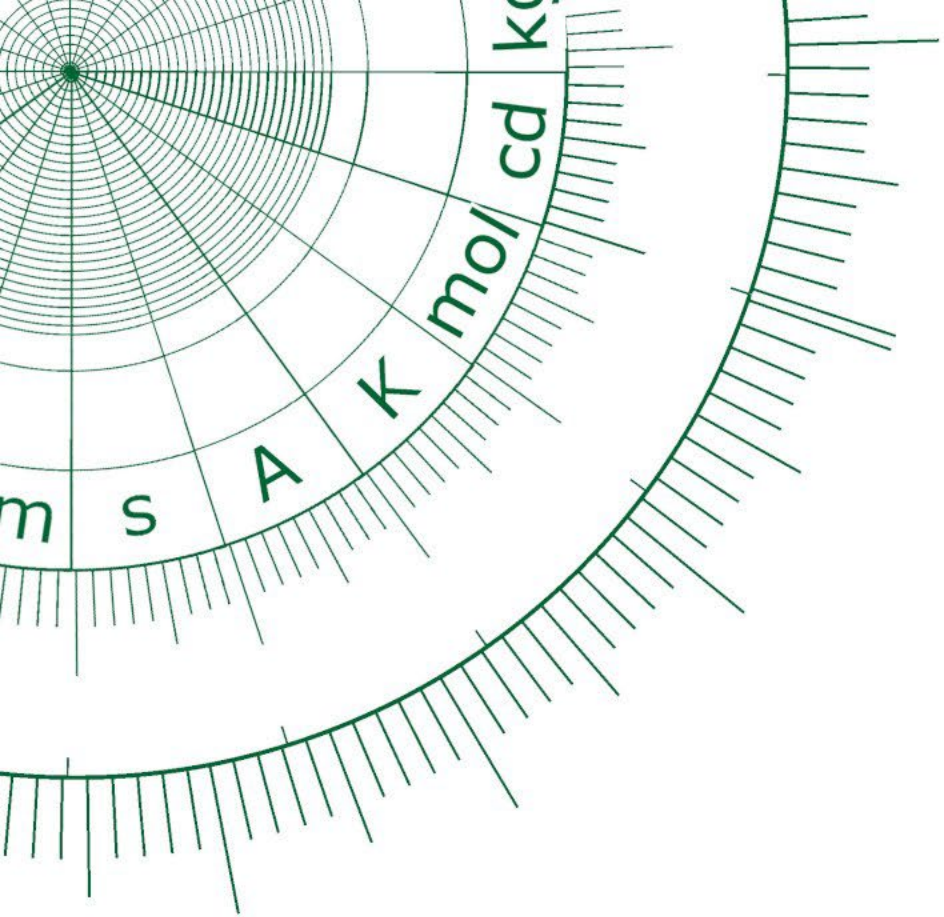
Boost GDP

With improved metrology, industry improves efficiency, reduces waste, and increases output.

Metrology...

- Industry engages with the tip of the iceberg – what is seen, is not always used or understood.
- What is not visible is the amount of '*keep and maintain'* measurement that goes on below the surface to disseminate the traceability.
- This remains the core focus of the National Metrology Institute of SA - ensuring and enabling global trade





nmisa

National Metrology Institute of South Africa

Thank You

We measure what matters