UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

SUSTAINABLE DEVELOPMENT GOAL 9
INDUSTRY, INNOVATION AND INFRASTRUCTURE

METROLOGY IN SUPPORT OF THE SUSTAINABLE DEVELOPMENT GOALS

General Conference on Weights and Measures
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Outline

- METROLOGY FOR SUSTAINABLE DEVELOPMENT
- UNIDO APPROACH TO QI DEVELOPMENT
- COLLABORATION WITH BIPM & OIML
- UNIDO WORK IN METROLOGY
- CONCLUSION

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METROLOGY FOR SUSTAINABLE DEVELOPMENT

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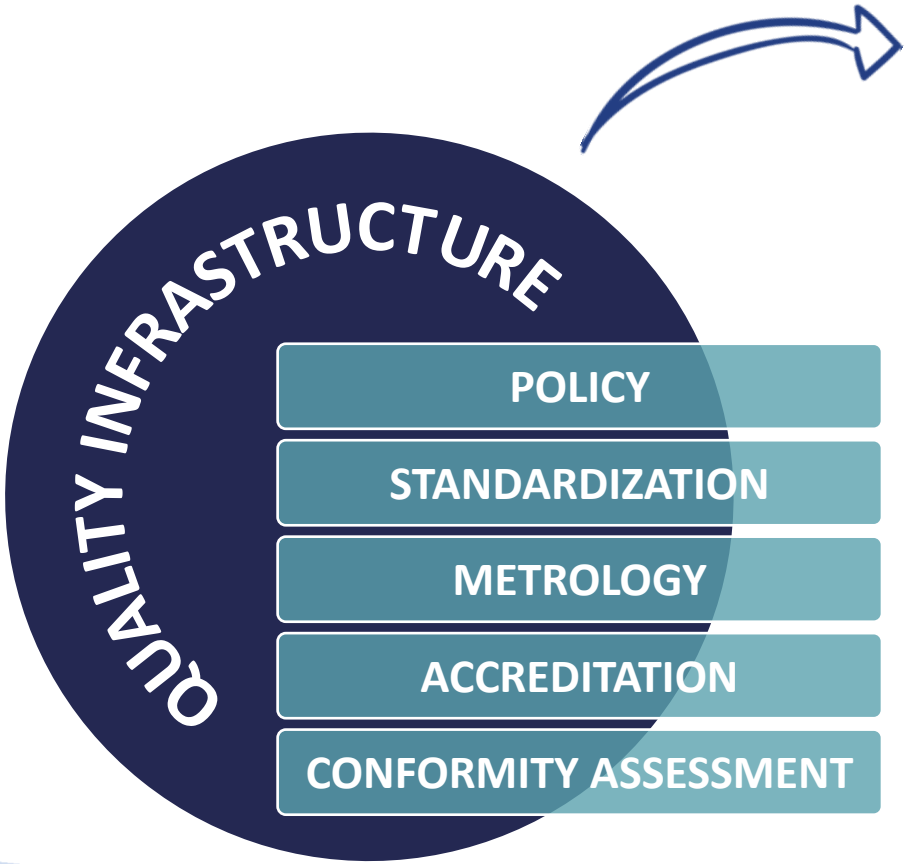
QI: Enabler for Sustainable Development



Quality Infrastructure Definition

> The **system** comprising the organizations (public and private) together with the policies, relevant legal and regulatory framework, and practices needed to support and enhance the quality, safety and environmental soundness of goods, services and processes.

The **quality infrastructure** is required for the effective operation of domestic markets, and its international recognition is important to enable access to foreign markets. It is a critical element in promoting and sustaining economic development, as well as environmental and social wellbeing. It relies on **metrology, standardisation, accreditation, conformity assessment, and market surveillance.**

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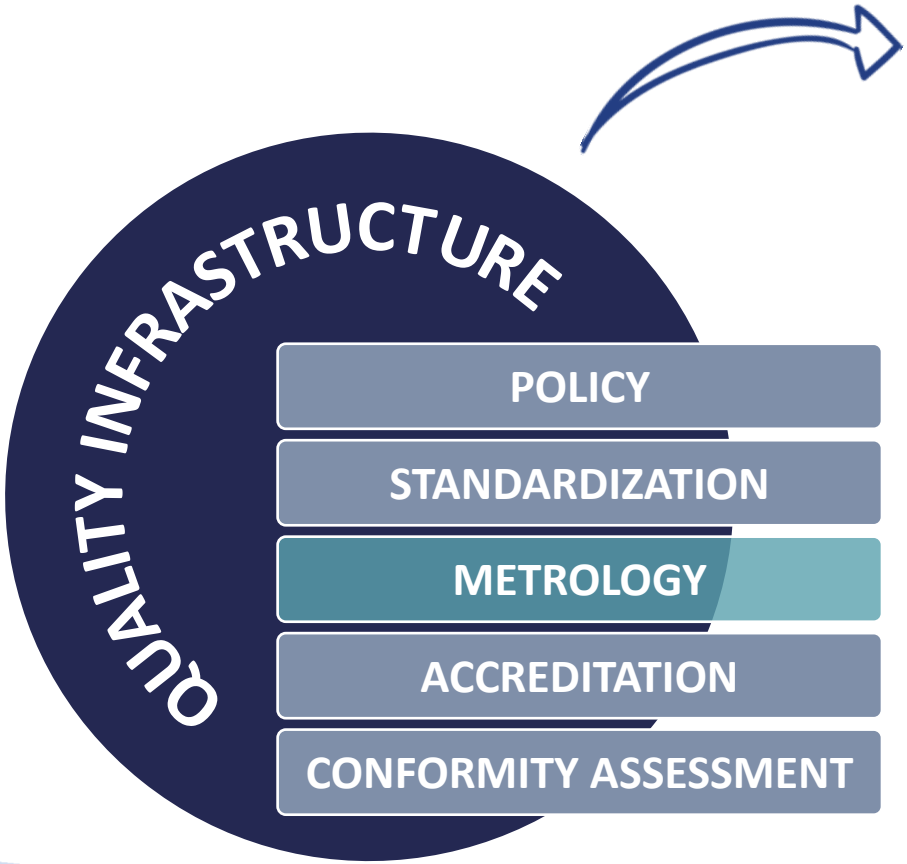
Metrology contributes to most SDGs



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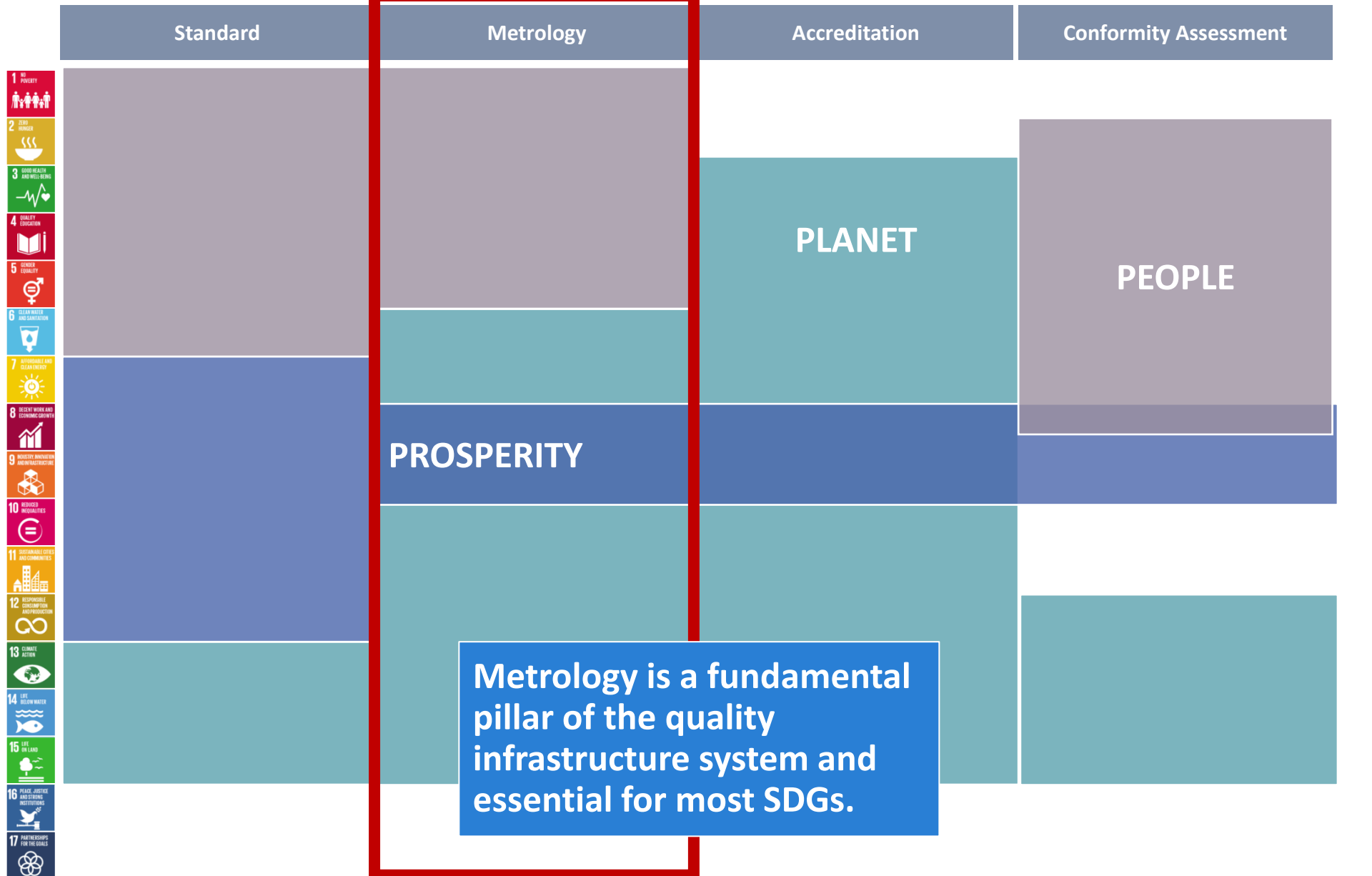

Metrology in the Context of the SDGs

Brochure highlights importance of metrology in achieving the SDGs

Developed in collaboration between UNIDO, BIPM and OIML

Metrology and the SDGs
Meeting the needs of People

The regulation of measurements by governments through a **legal metrology system aims to ensure a level playing for all in many fields of measurements:**

- Ensure that all farmers receive the correct payment for their produce and consumers will receive correct amount of goods for their money
- The control of pre-packed goods will help reduce fraud
- Correct measurement of raw materials exported in bulk may ensure that correct price is paid and also governments are able to collect correct taxes on exports

→ Legal metrology controls will **improve economic conditions for all** concerned and assist in poverty reduction

Metrology and the SDGs
Meeting the needs of People

- **Medical measurements are fundamental to prevention, diagnosis and treatment of diseases and other medical conditions.** Getting measurements right improves patient outcomes, saves time and reduces costs .
- **Internationally recognized and accepted equivalence of measurements** in laboratory medicine and traceability to appropriate measurement standards will lead to:
  - Improvement in the quality of healthcare of patients
  - Reduce false positive and false negative test results
  - Reduction in costs for government and healthcare insurers
  - Improvement of efficiency of health care
  - Global acceptability of measurements and tests, which removes technical barriers to trade

Metrology and the SDGs
Protecting the Planet

- **Accurate measurement is central to understand climate change** by identifying long-term trends of small magnitude from data that can vary enormously over very short timescales
- **Millions of measurements are made every day** covering some 50 essential Climate Variables using different techniques all around the world
- The data has to **be consistent so that it is meaningful and can be combined**, by making measurements that are fully traceable to SI units ensuring **stability of measurement over time**
- Emergence of emissions monitoring, carbon trading and other technologies such as carbon capture and storage all bring down their own measurement challenges

Metrology and the SDGs Building Prosperity

- The economic success of a country depends upon the ability to **manufacture and trade precisely made and tested products** and components that are accepted by trading partners
- To control manufacturing processes and guarantee quality of products, there is a need to align instruments to reference standards and **ensure measurement traceability**
- The ability to develop and deploy appropriate metrological methods is key for industry, **support product innovation, process improvement and quality assurance** to ensure that:
  - Components and finished products meet regulatory requirements, documentary standards and specifications
  - Consumer and industrial quality expectations are met, including product value/price and reliability

"If you can't measure it, you can't make it"

Partnerships

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SUSTAINABLE DEVELOPMENT GOALS

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UNIDO APPROACH TO QUALITY INFRASTRUCTURE DEVELOPMENT

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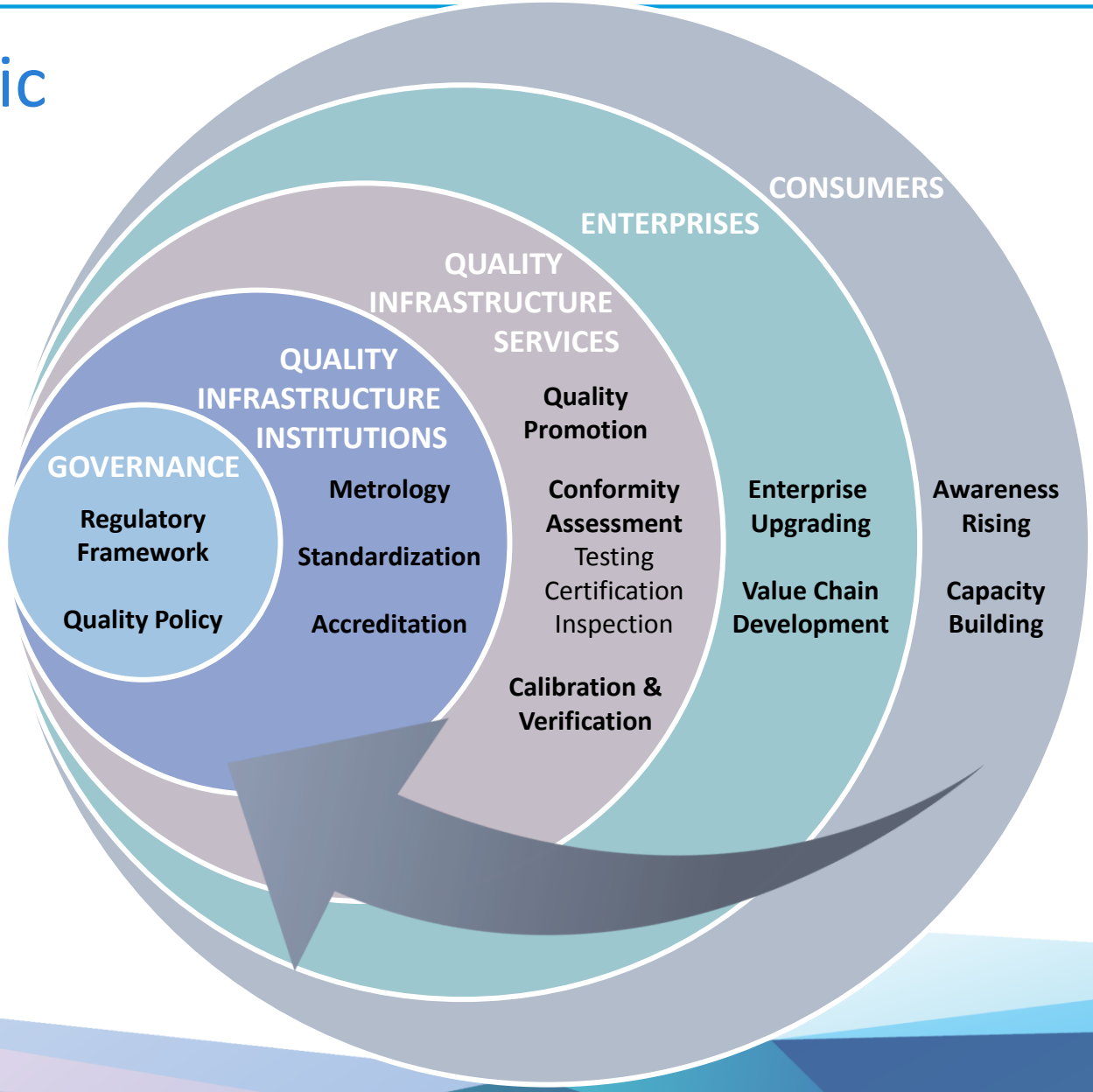
UNIDO: Systemic Approach to QI Development



The solid foundation for market regulation and consumer protection

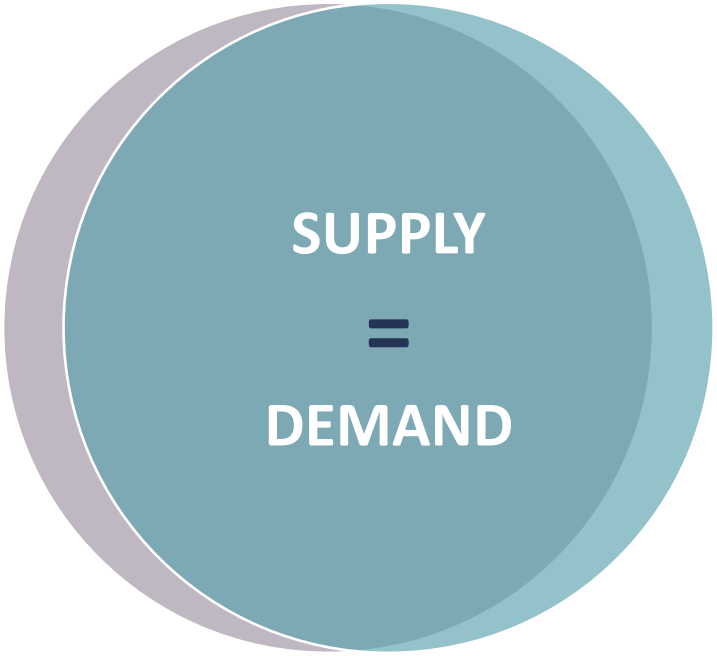
Sustainability in Quality Infrastructure Development

SUPPLY

CHALLENGE: in many cases, quality infrastructure is **SUPPLY-DRIVEN**, without the critical mass of demand

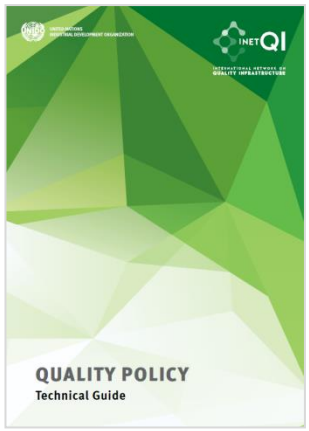
SOLUTION: DEMAND-DRIVEN quality infrastructure development

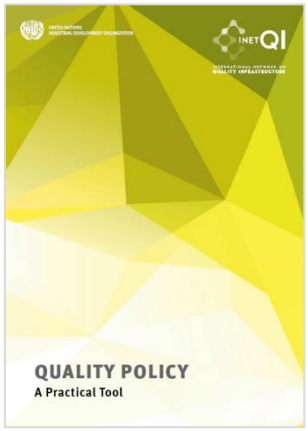
DEMAND



FOR SUSTAINABILITY, SUPPLY AND DEMAND NEED TO MATCH

Good Governance in Quality Infrastructure Development





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COLLABORATION WITH BIPM & OIML

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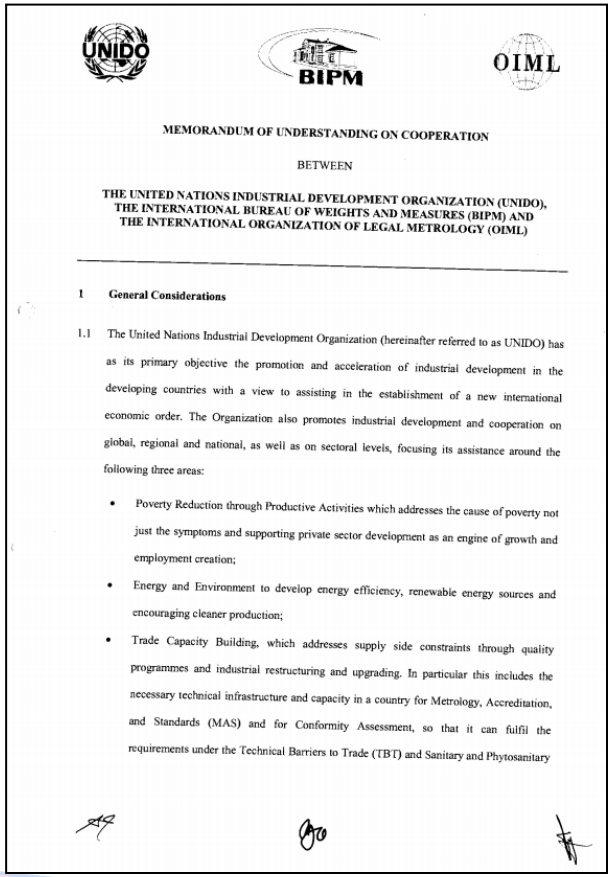
UNIDO MoU with BIPM and OIML



UNIDO BIPM OIML

MEMORANDUM OF UNDERSTANDING ON COOPERATION

BETWEEN

THE UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION (UNIDO),
THE INTERNATIONAL BUREAU OF WEIGHTS AND MEASURES (BIPM) AND
THE INTERNATIONAL ORGANIZATION OF LEGAL METROLOGY (OIML)

1 General Considerations

1.1 The United Nations Industrial Development Organization (hereinafter referred to as UNIDO) has as its primary objective the promotion and acceleration of industrial development in the developing countries with a view to assisting in the establishment of a new international economic order. The Organization also promotes industrial development and cooperation on global, regional and national, as well as on sectoral levels, focusing its assistance around the following three areas:

- Poverty Reduction through Productive Activities which addresses the cause of poverty not just the symptoms and supporting private sector development as an engine of growth and employment creation;
- Energy and Environment to develop energy efficiency, renewable energy sources and encouraging cleaner production;
- Trade Capacity Building, which addresses supply side constraints through quality programmes and industrial restructuring and upgrading. In particular this includes the necessary technical infrastructure and capacity in a country for Metrology, Accreditation, and Standards (MAS) and for Conformity Assessment, so that it can fulfil the requirements under the Technical Barriers to Trade (TBT) and Sanitary and Phytosanitary

MoU signed in 2008 between UNIDO, BIPM and OIML

Strategic partnership the field of metrology to:

- enhance the impact of industrial development on economic growth
- to minimize technical barriers to trade
- and to assist in the beneficial integration of developing countries and transition economies into the global economy

Principal fields of cooperation:

- Trade capacity building
- Training and
- Research

Metrology in the Context of the SDGs

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International Network on Quality Infrastructure

INETQI

INTERNATIONAL NETWORK ON
QUALITY INFRASTRUCTURE

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Intra-African Metrology System (AFRIMETS)

Norad

AFRIMETS METROLOGY SCHOOL

2011

76 African metrologists from **31 African countries** were trained to provide **measurement traceability** to their regional and local economies.

2014

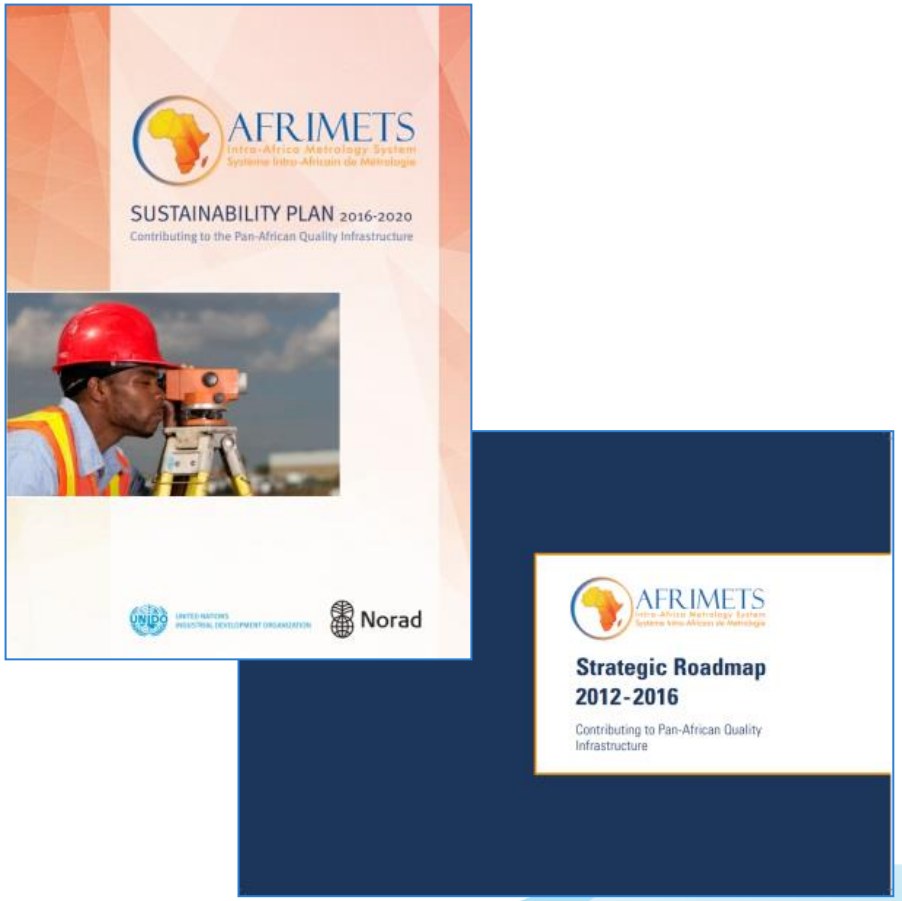
87 participants from **37 African countries** and **Haiti** were trained on **legal metrology**, **17 highly qualified speakers** gave presentations during the training.

Intra-African Metrology System (AFRIMETS)

Norad

ROADMAP & SUSTAINABILITY PLAN

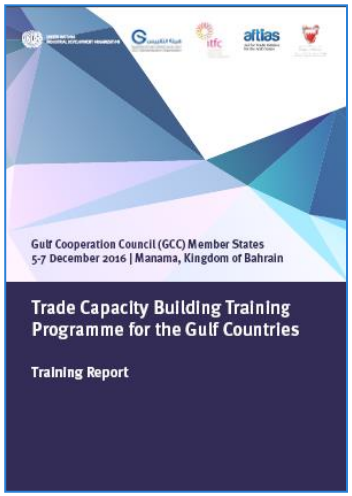
- The AFRIMETS Roadmap is intended to give a broad overview of the regional metrology situation and identify specific interventions that could improve capabilities over a relatively short period of time.
- The Roadmap thus aims to provide guidance to countries on how to establish a metrology infrastructure, identify approaches to pooling scarce resources and indicate what projects could be supported by prospective donors.



Quality Infrastructure Training

Kyrgyzstan 2013	Poland 2014	Mozambique 2015	Bahrain 2016	Caribbean's 2017
Regional Trade Capacity Building Training for Central Asia	Regional Trade Capacity Building Training for Caucasus and Western CIS	Regional Trade Capacity Building Training for LDCs	Regional Quality Infrastructure and Project Design Training Gulf Countries	Regional Quality Infrastructure and Project Design Training Caribbean's
Central Asia	Caucasus and Western CIS	Least Developed Countries (LDCs)	GSO Countries	Caribbean Islands

QI Training for Gulf Countries



5-7 December 2016 | Bahrain

Twenty experts from Arab states belonging to the Gulf Cooperation Council took part in a trade capacity building training course in the Kingdom of Bahrain.

The three-day course was organized by the United Nations Industrial Development Organization (UNIDO) under the patronage of the Ministry of Industry, Commerce and Tourism of Bahrain and in close cooperation with the Gulf Standards Organization (GSO).

Bureau International des Poids et Mesures

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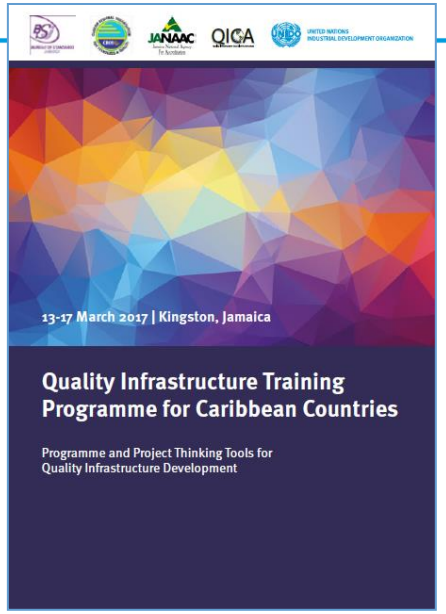
QI Training for Caribbean Countries

OIML



25 participants

14 countries

Antigua & Barbuda | Barbados
Dominica | Dominican Republic
Grenada | Guyana | Haiti
Jamaica | Montserrat | Saint Lucia
Saint Vincent & the Grenadines
Suriname | The Bahamas
Trinidad & Tobago

100% of the participants would recommend this programme to a colleague

Quality Infrastructure Training Programme for Caribbean Countries

13-17 March 2017 | Kingston, Jamaica

Programme and Project Thinking Tools for Quality Infrastructure Development

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TII TRADE INVESTMENT INNOVATION KNOWLEDGE HUB

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Quality Infrastructure and Trade

The Quality Infrastructure E-Learning builds on previous UNIDO training experiences. The training provides participants with the technical knowledge to understand the diverse issues pertaining to the essence of trade related capacities in promoting inclusive and sustainable industrial development.

After completing the E-Learning, participants should be able to:

- understand the importance of quality infrastructure for inclusive and sustainable trade development
- explain best practices and models for building a modern quality infrastructure
- outline the role of quality and standards in value chains

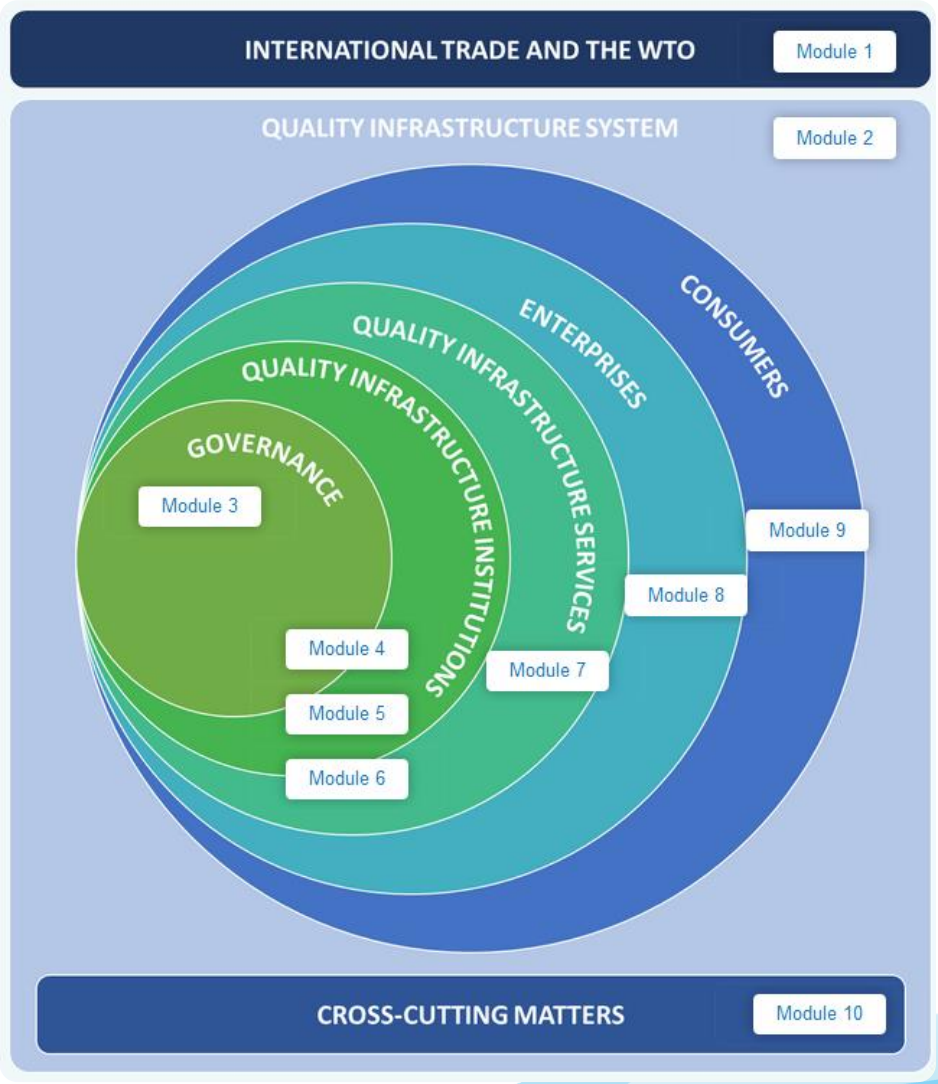
10 MODULES

1. The Global Context
2. Quality Infrastructure System
3. Governance
4. Metrology
5. Standardization
6. Accreditation
7. Conformity Assessment
8. Enterprises
9. Consumers
10. Cross-cutting matters

Quality Infrastructure and Trade

FEATURES

- User Profile
- 10 Technical Modules
- Interactive Exercises
- Videos
- Further reading material
- Discussion Forum
- Final Test
- Certificate



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UNIDO WORK IN METROLOGY

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UNIDO Work in Metrology

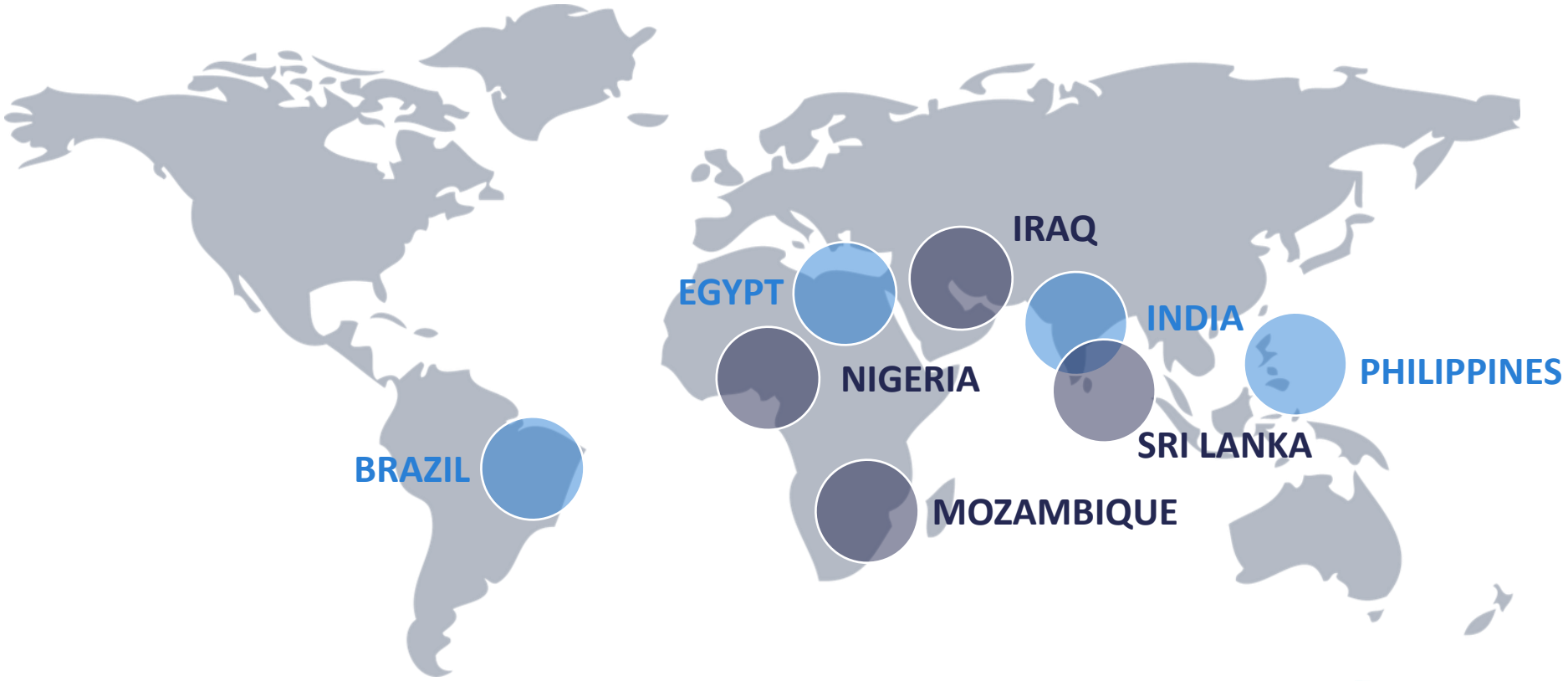
UNIDO has more than **40 years experience** in increasing competitiveness through quality and standards compliance

UNIDO is consistently chosen as the **main implementing UN agency** for quality infrastructure development

UNIDO is considered a **center of excellence** when it comes to trade capacity building

UNIDO has assisted in setting up numerous **National Metrology Institutes (NMIs)** worldwide

UNIDO supporting Metrology Worldwide



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UNIDO WORK IN METROLOGY
SRI LANKA

Sri Lanka: 1999-2005

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WHAT WAS DONE

INDUSTRIAL METROLOGY

- UNIDO and Metrology of Industrial Technology Institute (ITI) collaborated on establishing the Industrial Metrology lab as this was a gap faced by the industries and testing laboratories in Sri Lanka
- The laboratory building was refurbished at a cost of 6 million SLR (USD 6000) through Government contribution

EQUIPMENT & CAPACITY BUILDING

- UNIDO provided human capacity building support as well as procurement of equipment such as new central environmental control (CEC) system and equipment for 6 laboratories, worth in total over USD 600,000

ACCREDITATION

- UNIDO guided ITI to apply for accreditation, including covered the accreditation fees for 3 years

RESULTS AND IMPACT

- Built first Metrology Laboratory in the country
- Today ITI has accreditation as per ISO/IEC 17025:2005 in Mass, Temperature, Dimension, Electrical, Pressure and Volumetric Areas

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UNIDO WORK IN METROLOGY MOZAMBIQUE

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Mozambique: Setting um the NMI

WHAT WAS DONE

ESTABLISHING NMI: UNIDO assisted in the establishment of the National Institute for Standardization and Quality (INNOQ) new metrology laboratory in Zimpeto and has provided continuous support in the area of metrology and calibration

EQUIPMENT: state-of-the-art calibration equipment procured

CAPACITY BUILDING: international expertise provided to perform accurate calibration and provide related services

SUSTAINABILITY: Support provided to INNOQ (and its metrology function) for business unit concept, strategy and business plan, new management cost accounting system, marketing plan, strategy, communication plan and brand strategy

- Developing Quality Policy
- Strengthening INNOQ (incl. Metrology Function)
- Enhancing Conformity Assessment Services
- Supporting Private Sector Enterprises
- Raising Awareness

Mozambique: Setting up the NMI

RESULTS AND IMPACT

INNOQ expanded their metrology function and obtained accreditation for mass, temperature, and volume

- INNOQ increased the number of services provided, 6,321 verifications were conducted in 2015
- 82% more calibration were done in 2015 (compared to 2012)
- The combination of these initiatives contributes to the sustainability of INNOQ and enables them to become an independent service provider of state-of-the-art services in metrology

Services	2008	2012	2015	Increase from baseline
Nr. of calibrations	156	550	1003	**82%**
Nr. of verifications	0	4144	6321	**53%**

Mozambique: Weighbridge

- A weighbridge was procured by the project
- Enables customs to accurately weigh vehicles
- Enhanced control and increased security due to **accurate measurement**

*A **weighbridge** or railroad scale is a large set of scales, usually mounted permanently on a concrete foundation, that is used to weigh entire rail or road vehicles and their contents. By weighing the vehicle both empty and when loaded, the load carried by the vehicle can be calculated.*

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UNIDO WORK IN METROLOGY
NIGERIA

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Nigeria: Building Trust for Trade

WHAT WAS DONE

ESTABLISHMENT: Nigerian National Metrology Institute (NMI) and Metrology Society of Nigeria (MSN)

EQUIPMENT: 3 Metrology Laboratories fully equipped in NMI (pressure, temperature and electrical equipment)

CAPACITY BUILDING:

- Implemented capacity-building services to the Weights & Measurement Department of the Federal Ministry of Industry, Trade and Investment
- Study tour in industrial and legal metrology at NPL UK provided (4 technical experts trained)

RESULTS AND IMPACT

Developed and improved metrology and calibration activities in Nigeria

"Metrology is the key component of Nigeria's industrial growth and economic prosperity"

Engr. Obiora Manafa MSN President

Nigeria: World Metrology Day Celebrations 2018

Bureau International des Poids et Mesures

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UNIDO WORK IN METROLOGY
IRAQ

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Iraq: Rebuilding the NMI

Sida

WHAT WAS DONE

REBUILDING NMI: Central Organization for Standardization and Quality Control (COSQCs) metrology capacities were strengthened (development of quality manual)

CALIBRATION LABs: 7 calibration labs of COSQCs supported towards accreditation: mass, electrical measurements, dimensions, volume, force, temperature and pressure

- Equipment calibrated at an internationally recognized NMI, assuring traceability of labs measurement results
- Upgrading of quality management system and procedures

TRAINING AND CAPACITY BUILDING: 308 personnel of metrology department were trained and qualified in relevant metrology and calibration topics through 30 training courses

NATIONAL METROLOGY LAW was reviewed and assessed in line with MRA of BIPM and Regional metrology organizations

Iraq: Rebuilding the NMI

Sida

RESULTS AND IMPACT

- COSQC's mass and volume laboratories participated in PT schemes
- COSQC was fully recognized by BIPM as a full member in 2014, and is participating since June 2014 in CIPM MRA
- **128** new policies, manuals and procedures developed
- **392** beneficiaries trained
- **45** technical workshops conducted
- **2** partnership agreements established

CONCLUSION

Metrology is essential to protect the planet, ensure dignified lives for all people and achieve inclusive economic growth and prosperity.

The new SI system will help to further increase efficiency and accuracy and thus contribute to achieving the Sustainable Development Goals.

THANK YOU.

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