

An Overview of QI and Metrology in Türkiye and OIC

TÜBİTAK UME

National Metrology Institute

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Outlines

- **The importance of Metrology**
- **Metrology in Türkiye**
- **UMEs Activities**
- **The current situation of Metrology in OIC**



Quality Infrastructure at a Glance

Bureau
International des
Poids et
Mesures



The main role of the Metrology in QI is to guarantee the measurements by the traceability

Metrology account approximately 3%-6% of GDP in developed countries (USA, Canada, UK and Europe)



Role of Metrology

SCIENCE and INNOVATION



QUALITY of LIFE



INDUSTRY and TRADE

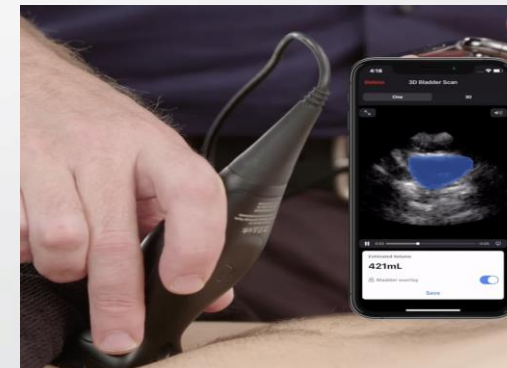


Metrology influences, drives and underpins much of what we do and experience in our everyday lives



Metrology for SDGs

- Improvements in the quality of healthcare of patients
- Reduction in “false positive” and “false negative” test results through accurate and reliable measurements
- Providing traceability for novel treatment and therapy technics
- Development of reference materials for reliability of laboratory medicine testing
- Development of new instrumentation for modern imaging treatment and therapy



Metrology in the Center of QI

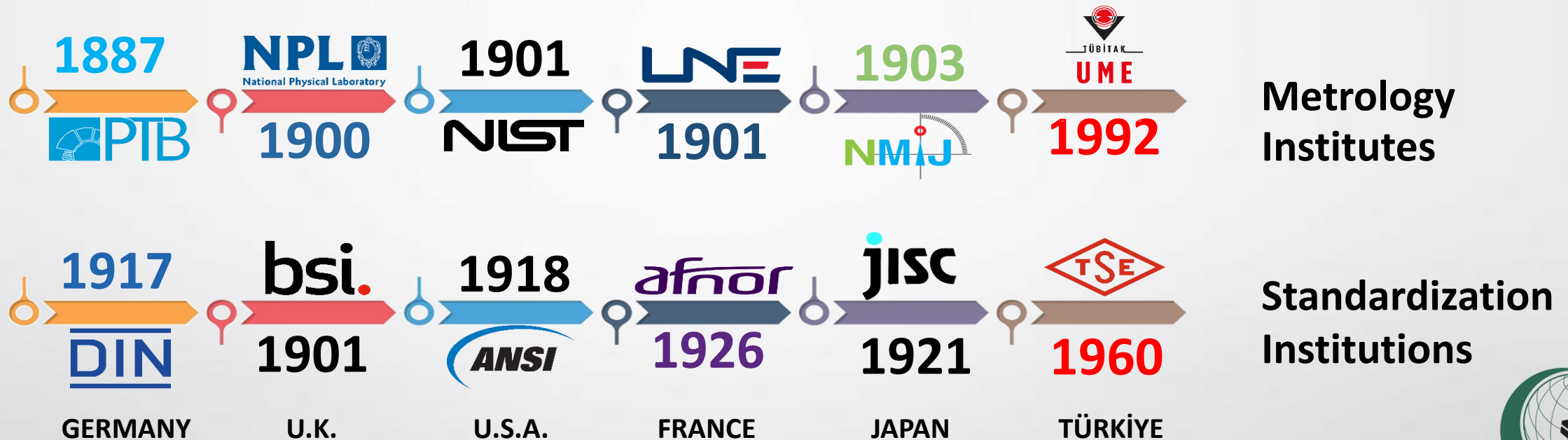


International Bureau
of Weights and Measures

1875



Metre Convention signed by 17 original signatories



Quality Infrastructure in Türkiye



Presidency

Ministry of Industry and Technology

Ministry of Energy and Natural Resources

Ministry of Foreign Affairs

Ministry of Trade

TÜBİTAK

(Scientific and Technological
Research Council of Turkey)

TÜBİTAK UME
(National
Metrology
Institute) NMI

TÜBİTAK MAM
(Material Inst.
Underwater
Acoust. Lab) DI

MSÜGGM
(General Directorate on
Metrology and Safety
of Industrial Products)

TSE
(Turkish
Standards
Institution)

TENMAK - NÜKEN
(Turkish Energy,
Nuclear and Mining
Research Center) DI

TÜRKAK
(Turkish
Accreditation
Body)

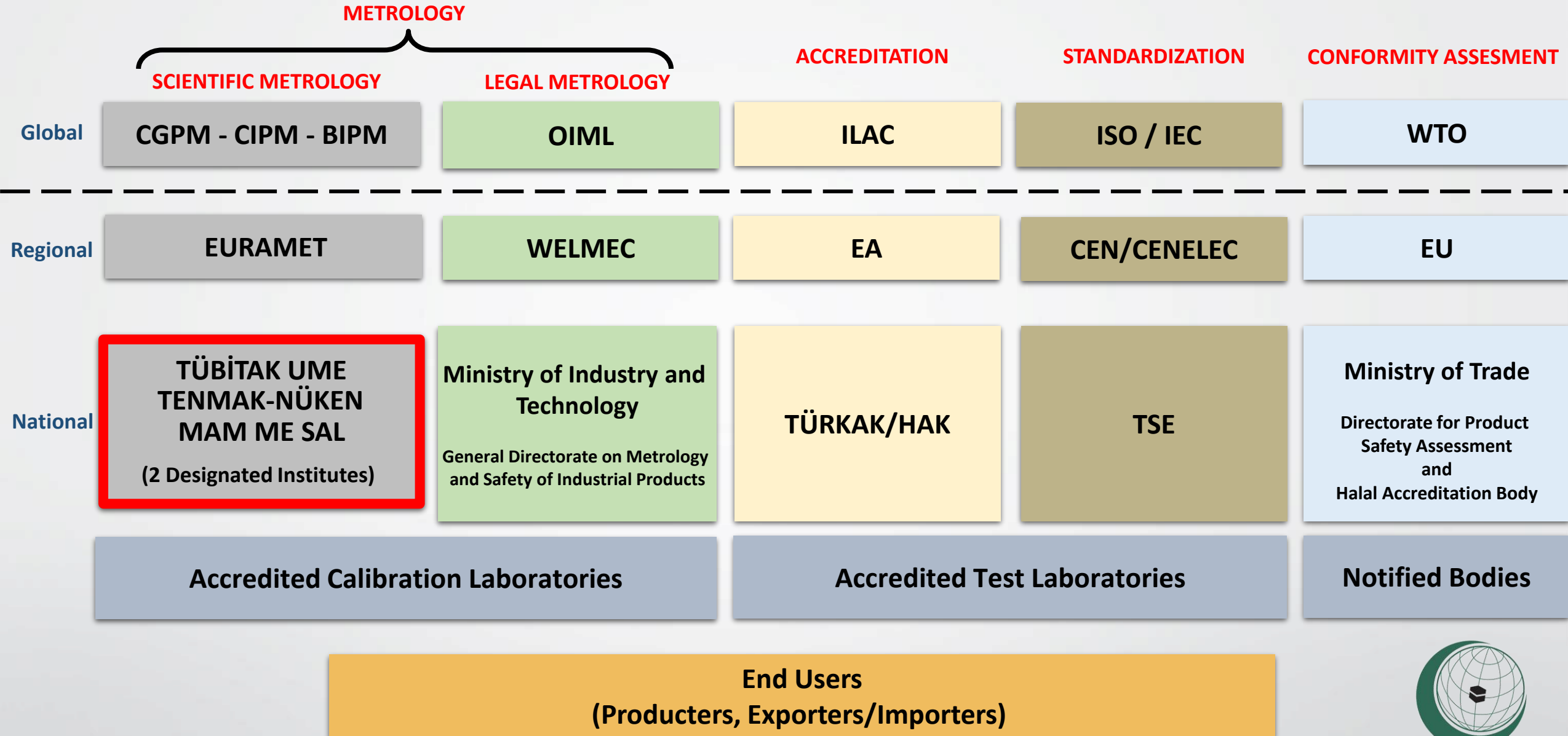
ÜGDGM
(Directorate for Product
Safety and Assessment)

HAK
(Halal
Accreditation
Body)



Accredited Test and Calibration Laboratories, Manufacturer Laboratories

TÜBİTAK UME in the Global Quality Infrastructure





TÜBİTAK UME's Activities

- Realization and maintenance of national reference measurement standards traceable to SI units
- Dissemination of measurement traceability nationwide through calibration services, ILCs and PTs offered to accredited laboratories, industry and public agencies
- Provision of training and consultancy services
- Development and production of metrological instruments and reference materials
- Performance of research and development towards developing new measurement techniques and standards, providing solutions for industrial measurement needs and enabling new production technologies
- Representation of Türkiye in international metrology organizations



International Relations

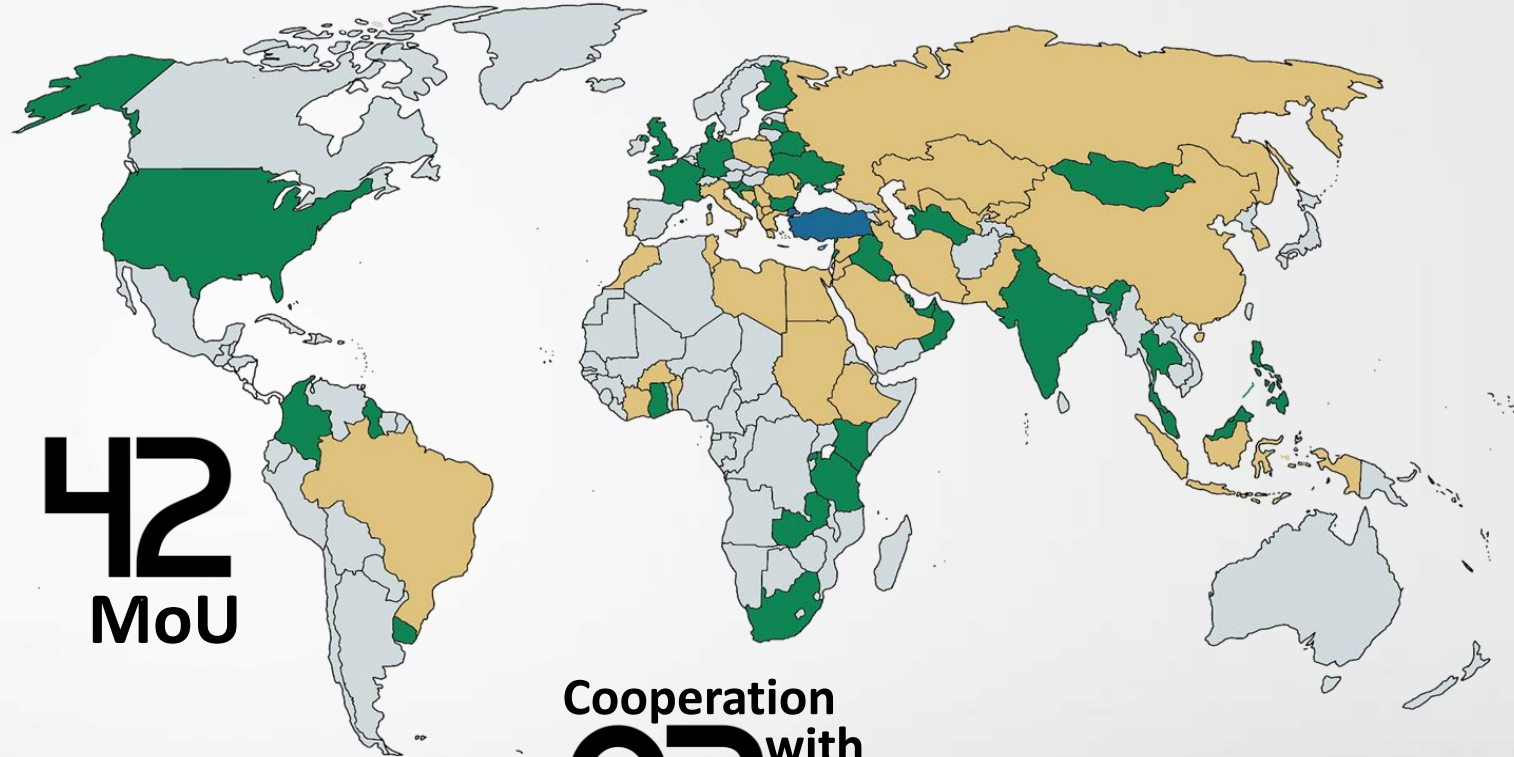


Services provided to 30 countries annually

MoU (Memorandum of Understanding) Signed Countries

ABNORM (Burkina Faso)
ANM (Tunisia)
ANM (Benin)
BoM (North Macedonia)
CSM (Kirgizstan)
COOMET
DMDM (Serbia)
DPM (Albania)
ESYP- EIM (Greece)
GSO
GUM (Poland)
IMBiH (Bosnia and Herzegovina)
IMBiH (Bosnia and Herzegovina)-
MSÜGGM
INM (Moldova)
INM (Romania)
INMETRO (Brazil)
INRiM (Italy)
IPQ (Portugal)
KazStandart (Kazakhstan)

KDM (Kosovo)
KIM-LIPI (Indonesia)
KRISS (South Korea)
LANEMA (Ivory Coast)
LNCSM (Libya)
LPEE/LNM (Morocco)
NINVAST (Pakistan)
NIM (China)
NIS (Egypt)
NMCI-INSO (Iran)
NSCL (Syria)
NMIE (Ethiopia)
RSS-JNMI (Jordan)
SASO (Saudi Arabia)
SCSMP (Azerbaijan)
SSMO (Sudan)
TGSB (Gambia)
UzNIM (Uzbekistan)
VNIIFTRI (Russia)
VNIIM (Russia)



42
MoU

Cooperation
92 with
countries
in total

MoU Signed Countries

Services Provided Only Countries

Calibration
Training
Consultancy
Project
Production
Establishment



Economic Impact of OIC in the World

- Total trade volume worldwide: ~ 50 Trillion USD (*COMCEC Trade Outlook-2023*)

OIC as producer (exporter): 11,2 % (*SESRIC OIC Economic Outlook-2023*)

OIC as consumer (importer): 9,7 %



- Total halal products trade volume worldwide: 2 Trillion USD (*Statista*)

OIC as a producer (exporter): ~ 25 %

OIC as a consumer (importer): ~ 75 %

In 2021, Muslims around the world spent a total of 2 trillion U.S. dollars across the food, pharmaceutical, cosmetics, fashion, travel, and media/recreation sectors. The global Muslim market has the potential to grow to about 2.8 trillion dollars by 2025. The largest market for Muslim consumers is the halal food and beverage sector.

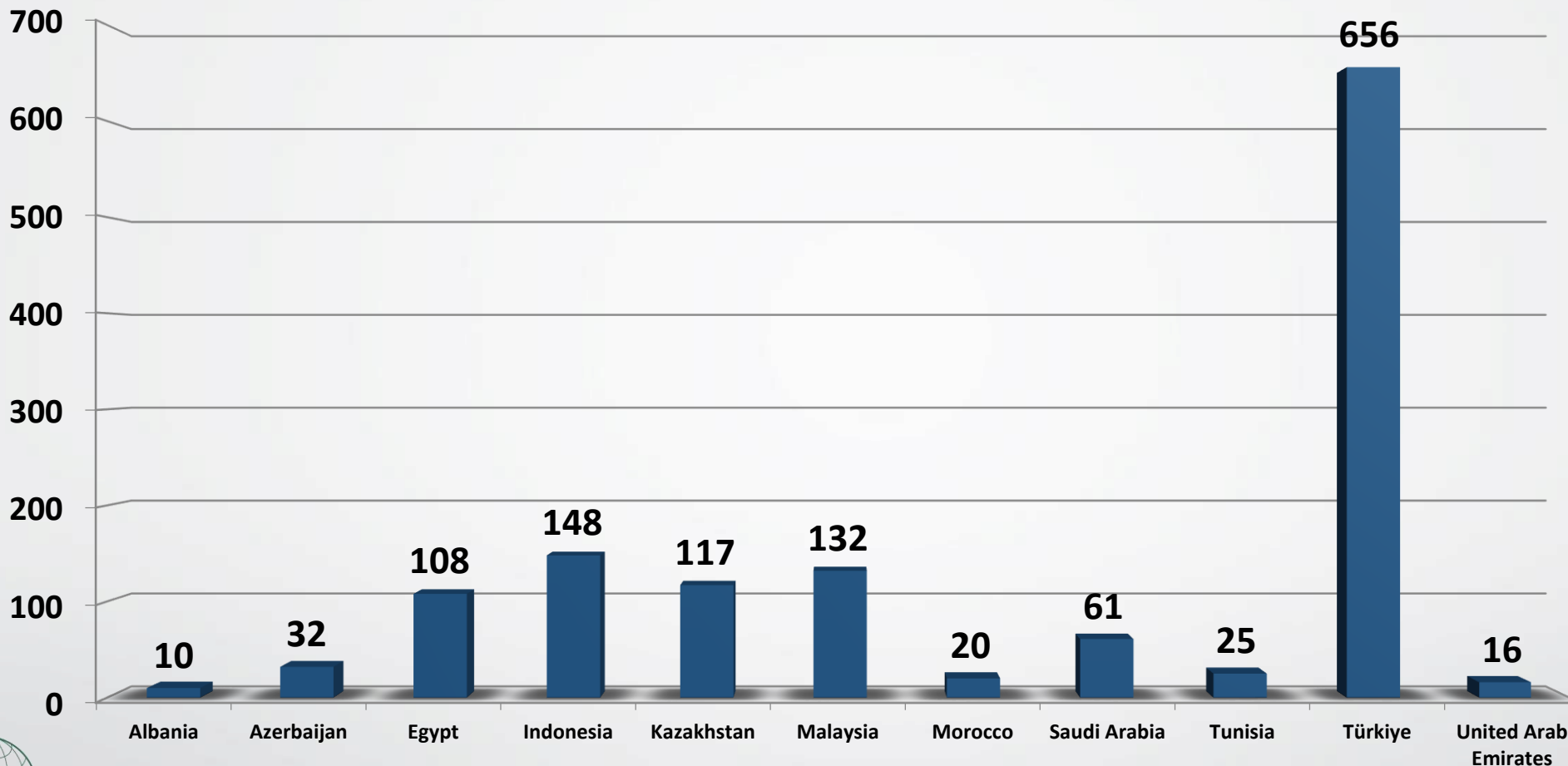
(<https://www.statista.com/statistics/796103/global-muslim-market-size>)



Current Capabilities of OIC Member States

CIPM MRA Signatory
OIC Member States: 20

Number of CMCs Published on the BIPM KCDB of OIC Member States (11)



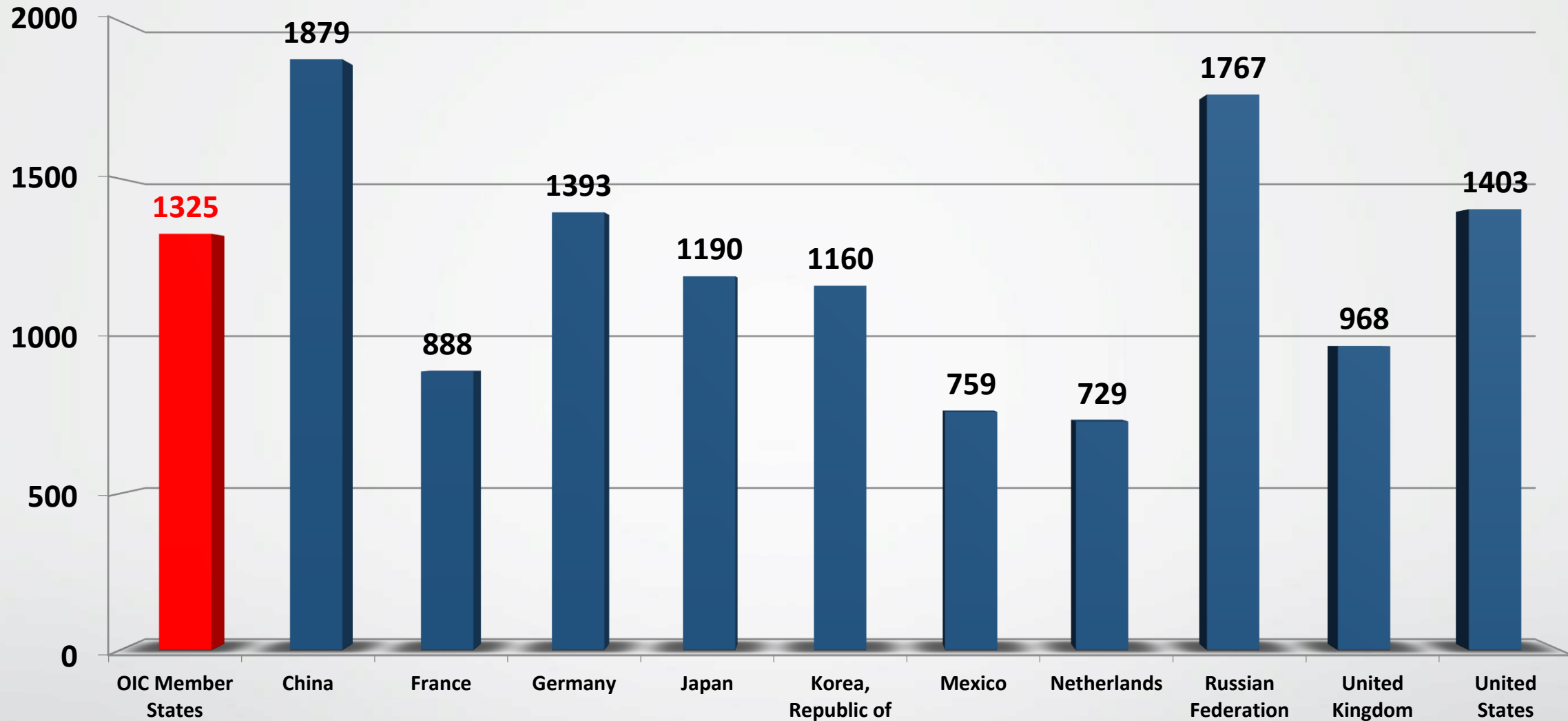
Albania
Azerbaijan
Bangladesh
Egypt
Indonesia
Iran (Islamic Republic of)
Iraq
Kazakhstan
Kuwait
Malaysia
Morocco
Oman
Pakistan
Qatar
Saudi Arabia
Syrian Arab Republic
Tunisia
Türkiye
United Arab Emirates
Uzbekistan

Source: BIPM KCDB, Date: 02 May 2024

<https://www.bipm.org/kcdb/cmc/statistics/public>



CMCs of OIC Member States (57) with Leading Economies

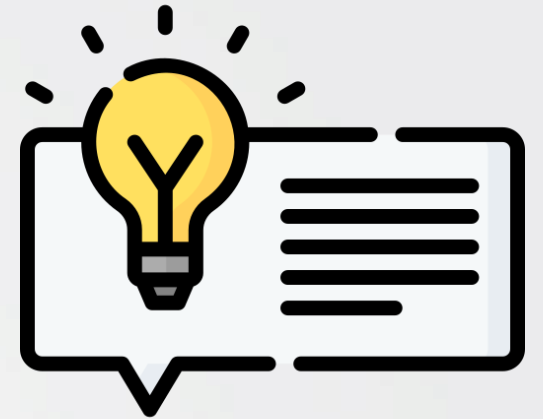


Source: BIPM KCDB, Date: 02 May 2024

<https://www.bipm.org/kcdb/cmc/statistics/public>



One Suggestion



- There is a big gap between leading NMIs and NMIs of OIC countries
- Metrological problems (traceability, RMs, ILCs, R&D) related to **HALAL** products are not handled by any organisation

Therefore;

Similar to the mission undertaken by BIPM, a metrology center should be established to meet the metrological requirements of Halal products for OIC countries.



Thanks



National Metrology Institute



TÜBİTAK

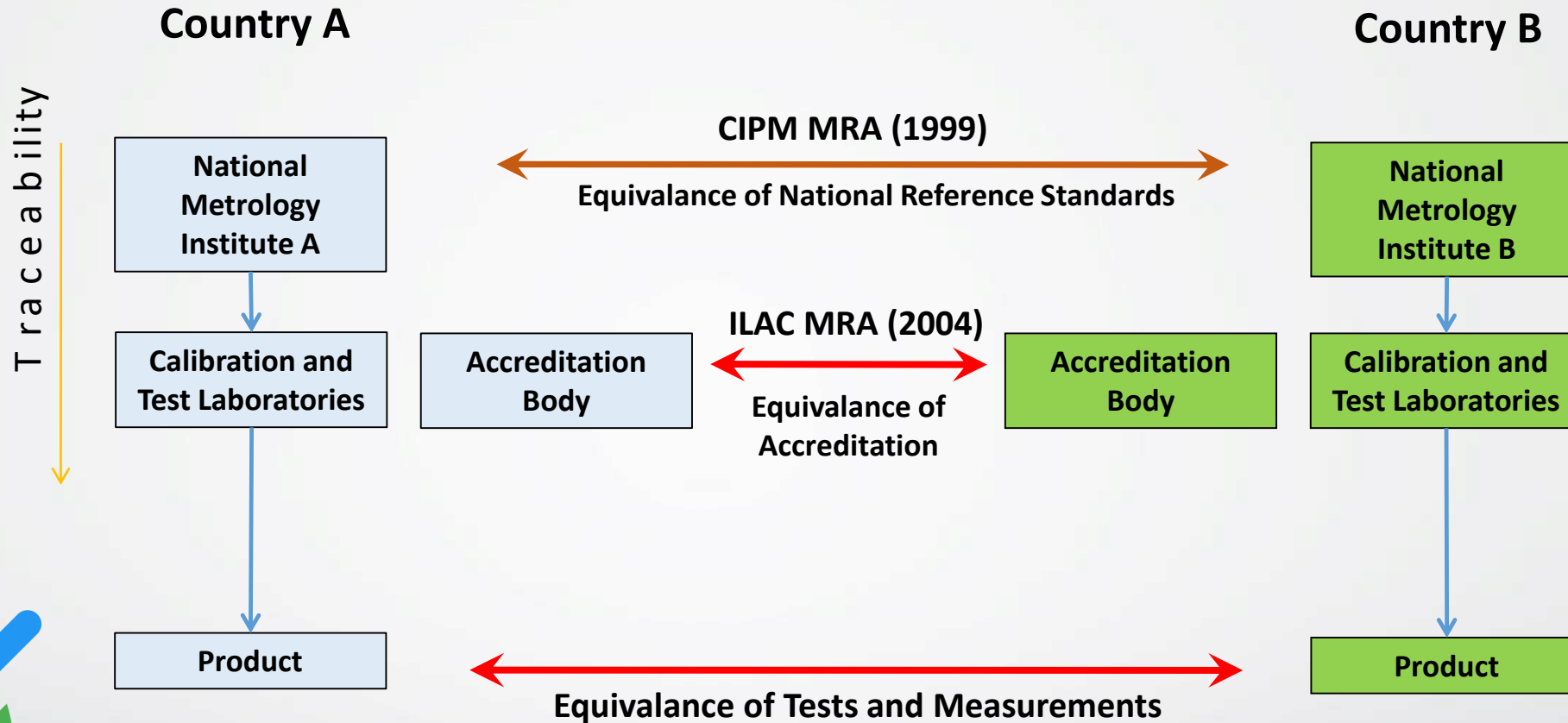
sustainable
via **life**
metrology



TÜBİTAK NATIONAL METROLOGY INSTITUTE

TRUE
MEASUREMENT
EXCELLENCE

Equivalence of Measurements



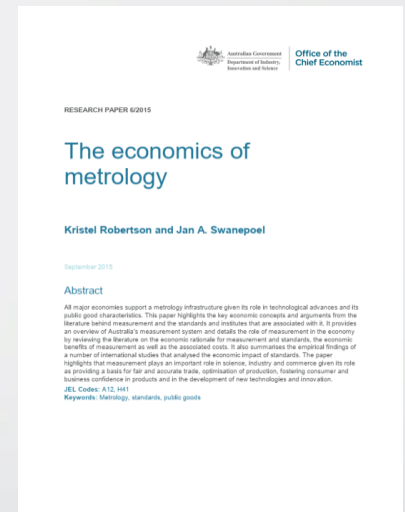
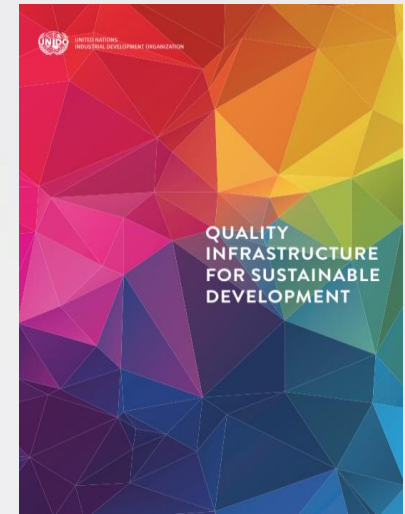
Single Measurement... Accepted Everywhere...



Economic Impact of Metrology



- Over the 11-year period, 2000–2011, 16 economic impact studies (covering a wide range of technologies and industries) reflect an average benefit-cost ratio of 47:1. The studies were related to investments made to NIST Laboratories.
- Study made by National Measurement Office (UK) in 2009 showed that additional government investment of £6 million (an additional 10 per cent investment) in the National Measurement System would produce a return of £300 to £400 million for the UK economy. Economic modelling were used in the study.
- Studies were made during 2000-2002 with the support of EU for analyzing the economic role of measurements and testing in modern Europe. It was founded that expenses on metrology amounting to 1% of the EU GDP (all forms of measurements were included) boosted the GDP by 2.7%. In other words, for each Euro spent on metrology, the economy receives an income of about 3 Euros.
- Metrology (measurement and measurement related operations) account approximately 3%-6% of GDP in developed countries (USA, Canada, UK and Europea



References:

Kristel Robertson and Jan A. Swanepoel, *The economics of metrology*, RESEARCH PAPER 6/2015

G. Williams, "The assessment of the economic role of measurement and testing in modern society," European Measurement Project Report, July 2002

H. Uğur, Consultant of World Bank, COMSAT, Workshop on Metrology for Least Developed Countries, 26-27 November 2018 / Gebze, Türkiye

