

Today I briefly cover:

- What is Metrology?
- Why it is a part of national quality infrastructure?
- How it contributes to legitimate regulatory objectives?
- In which manner does regional/international harmonization in this area address TBT/trade?
- Top future challenge

What is metrology?

“The science of measurement, and its application”



The better you can measure, the better you can do ‘stuff’

“types” of metrology

No absolute definition, but often one sees the following terms:

- **Scientific metrology**, realization and dissemination of units (“metrological traceability”), and research to be able to measure ‘better’
- **Legal metrology**, legal or regulatory requirements
 - those affected have conflicting interests, or don't have the competence or the possibility to evaluate the reliability of the measurement results
 - legal evidence is needed of measurement reliability
 - health & safety require reliability of measurement
- **Industrial metrology**, measurements on the shop floor, or out in the field, instrumentation

Bureau
International des
Poids et
Mesures

The BIPM –

the intergovernmental organization through which Member States act together on matters related to measurement science and measurement standards

The BIPM's **mission** is to work with the NMIs of its Member States, the RMOs and strategic partners world-wide and to use its international and impartial status to promote and advance the global comparability of measurements for:

- Scientific discovery and innovation,
- Industrial manufacturing and international trade,
- Improving the quality of life and sustaining the global environment.



Custodian of the International System of Units (SI)

Established in **1875** –

64 Member States and 36 Associates

108 of the 193 states listed by the UN now participate in the BIPM's activities, covering around 98 % of the world's GDP according to 2021 IMF data.



The OIML –

the intergovernmental treaty organization which develops model regulations, standards and related documents for use by legal metrology authorities and industry

The OIML's **mission** is to enable economies to put in place effective legal metrology infrastructures that are mutually compatible and internationally recognised, for all areas for which governments take responsibility, such as those which facilitate trade, establish mutual confidence and harmonize the level of consumer protection worldwide.

Established in **1955** –

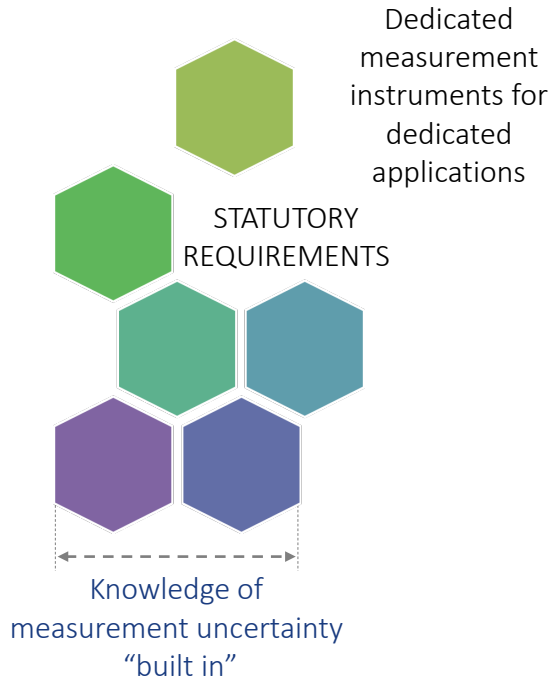
63 Member States and 64 Corresponding Members

- *OIML Recommendations*
 - *Models for technical legislation*
 - *Member States "morally obliged" to use them when regulating measuring instruments*
- *Other guidance and best practice publications*

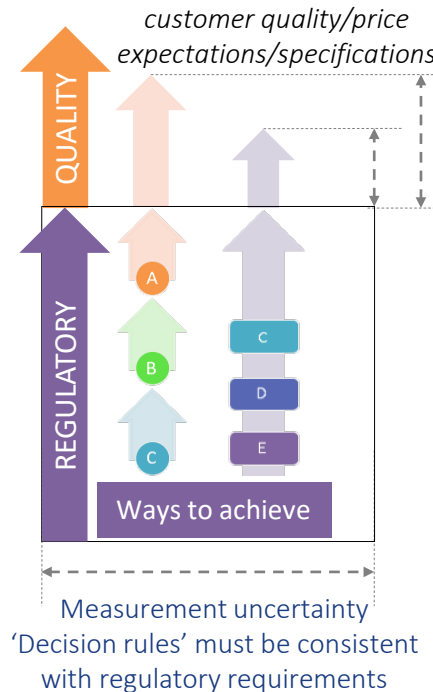
Measurement from a variety of perspectives

Measurements play a crucial role in conformity assessment

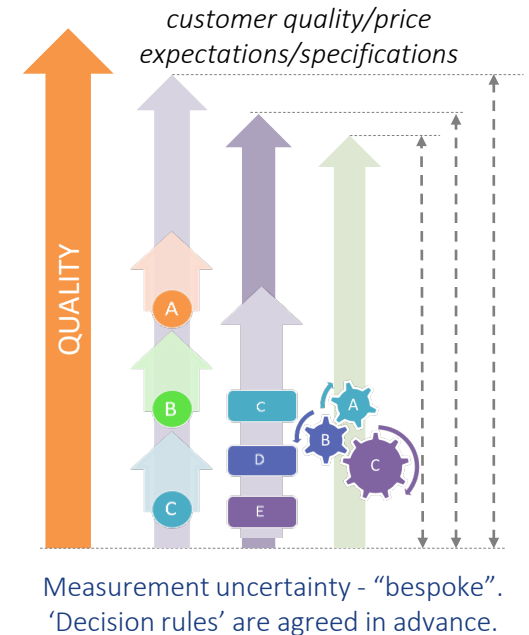
LEGALLY CONTROLLED MEASUREMENT INSTRUMENTS



REGULATED MEASUREMENTS



UNREGULATED MEASUREMENTS



Quality infrastructure

“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.

it relies on

- *metrology*
- *standardization*
- *accreditation*
- *conformity assessment, and*
- *market surveillance” (in regulated areas)”*

“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.”

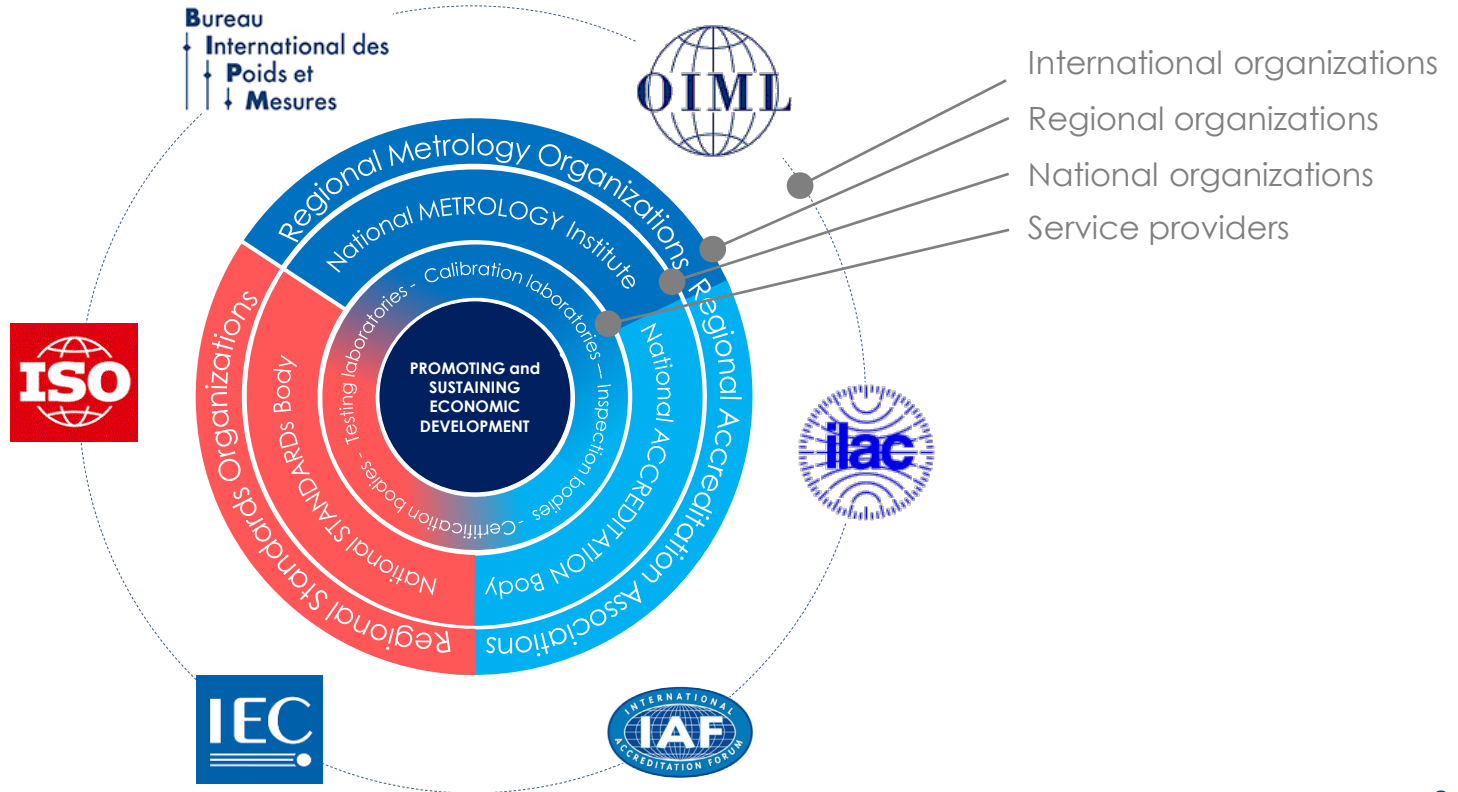
adopted in June 2017 by the DCMAS Network.

Now INetQI.

INetQI current 14 Members: BIPM, IAF, IEC, IIOC, ILAC, IQNET Association, ISO, ITC, ITU, OIML, UNECE, UNIDO, WTO and World Bank.



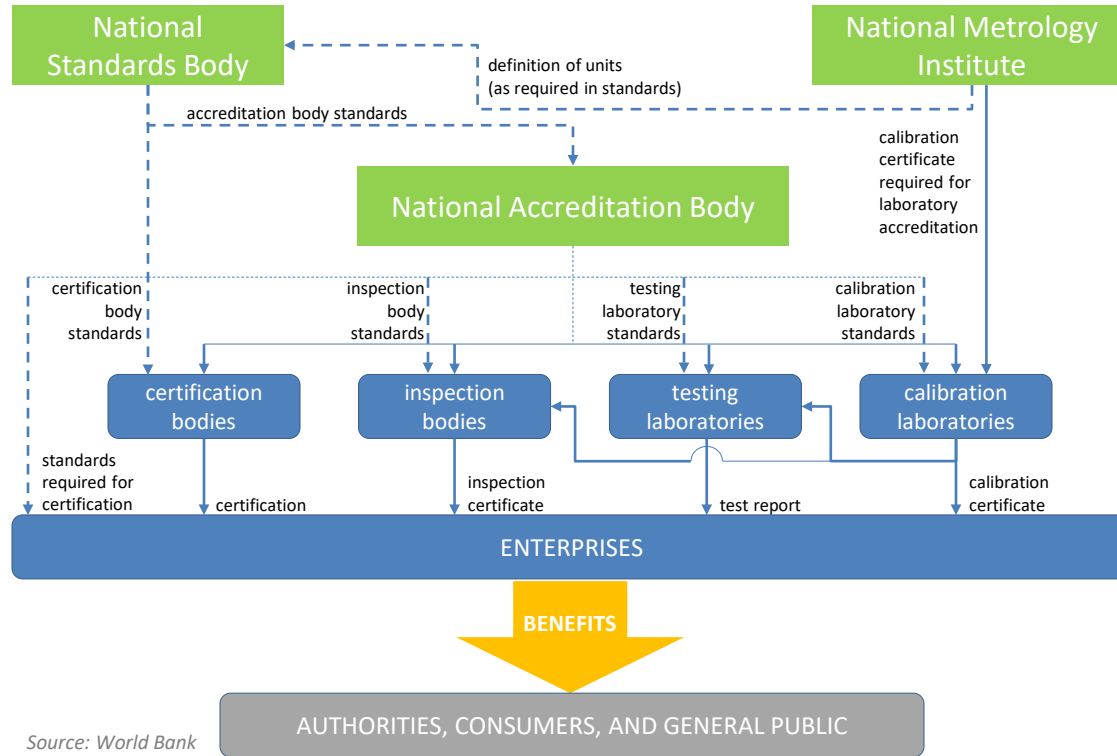
Some Key QI players ...



QI links at regional level

Europe	Americas	Asia Pacific	Euro-Asia	Africa	Gulf
Metrology					
EURAMET	SIM	APMP	COOMET	AFRIMETS	GULFMET
Accreditation					
EA	IAAC	APLAC	-	AFRAC	GAC
Standards					
CEN/CENELEC/ ETSI	COPANT	PASC	EASC	ARSO	GCC-GSO

Global “Quality Infrastructure”



- Enhanced product quality and compatibility
- Enhanced safety and health
- Decreased environmental impact
- Increased trade opportunities
- Facilitating innovations to the market place

UNIDO recognizes the importance of QI



<https://hub.unido.org/qi4sd/sdg>

THE QI4SD INDEX IS RELATED TO THE 3PS OF THE SDGS

Sustainable development is detailed in the 17 Sustainable Development Goals (SDGs). To simplify this division, this work uses the so-called “3 Ps”, which are **People**, **Planet** and **Prosperity**. Aggregating to this level allows a clearer analysis according to the canonical “pillars” of sustainable development: social (people), environmental (planet) and economic (prosperity).

Each country has a score representing the state of QI in the **People**, **Planet** and **Prosperity** pillars, using data relating to social, environmental and economic issues respectively. These scores are calculated using a subset (9 of 36) of the indicators in the Metrology, Standards, Accreditation and Conformity Assessment dimensions, because no sufficiently detailed data was available in the Policy dimension.

The digital challenge

Turning units (and quantities) from something humans read and understand ...

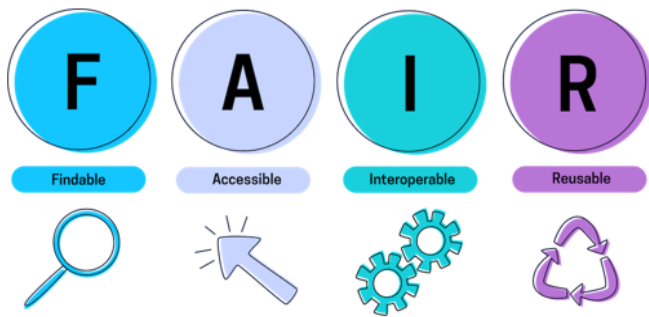
...into something machines can understand

Le
Système
international
d'unités 9^e édition 2019

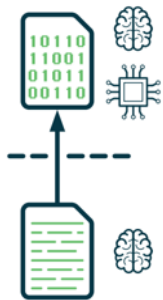
**The
International
System of
Units**



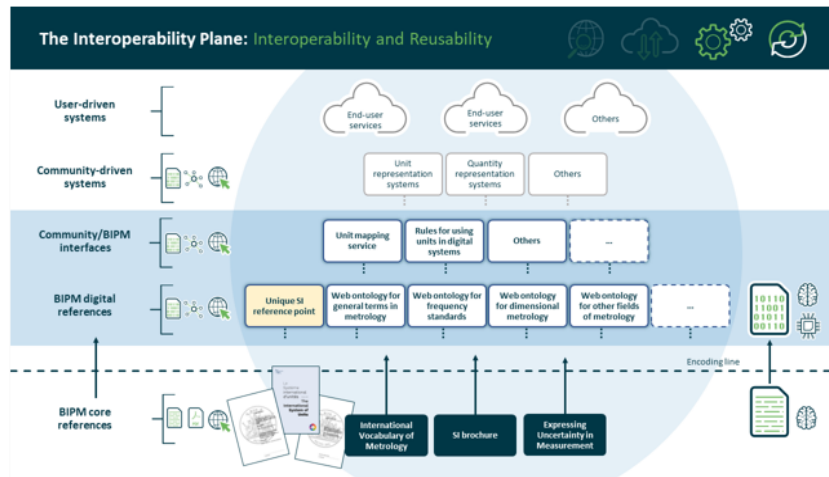
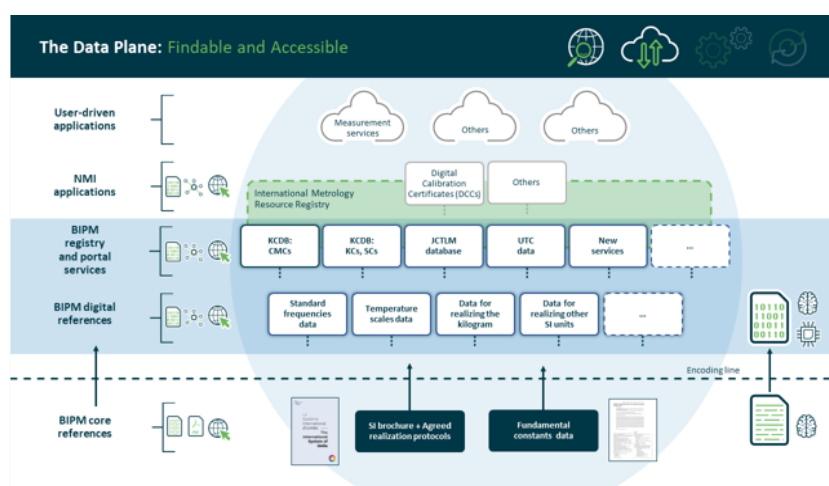
Making data



Transitioning to machine- (as well as human-) accessible formats:



- Unique SI Reference Point
- Digital VIM
- Application Programming Interfaces (APIs) for the BIPM's databases; already available for:
 - Calibration and measurement capabilities (CMCs) in the KCDB
 - Universal Coordinated Time (UTC) data
 - Laboratory medicine database (JCTLM)
 - Standard frequencies
- Structured data being compiled to support



Conclusions

- Metrology and the other QI elements are back bone capabilities
- At national, regional and international level the elements have to link up effectively
 - in each pillar
 - across pillars
- Regulators need to make best use of this infrastructure

Annual Review 2021/2022



THANK YOU

*Happy to answer
any questions*

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