

Metre Convention Treaty

International Bureau of Weights and Measures - BIPM and the Role of the National Metrology Institutes

Robert Kaarls, Secretary CIPM

**International Committee for Weights and Measures
President, Consultative Committee for Metrology in
Chemistry - CCQM**

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Standards and measurements for Biofuels: Facilitating Global trade*

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Outline

- Living in a globalized world
- Comparability through metrological traceability
- National Metrology Institutes and services
- The Metre Convention, CGPM, CIPM and BIPM
- The CIPM Mutual Recognition Arrangement

Living in a globalized world

- Global production and services
- Global market, global energy production
- Global travelling of persons
- Global transport of animals/animal products, agricultural products
- Global spread of diseases
- Global environmental issues, climate change
- Need to take away Technical Barriers to Trade – WTO TBT committee
- Need to comply with Sanitary and Phyto-Sanitary Measures - WTO SPS measures

“Once measured, everywhere accepted” requires Comparability through Traceability

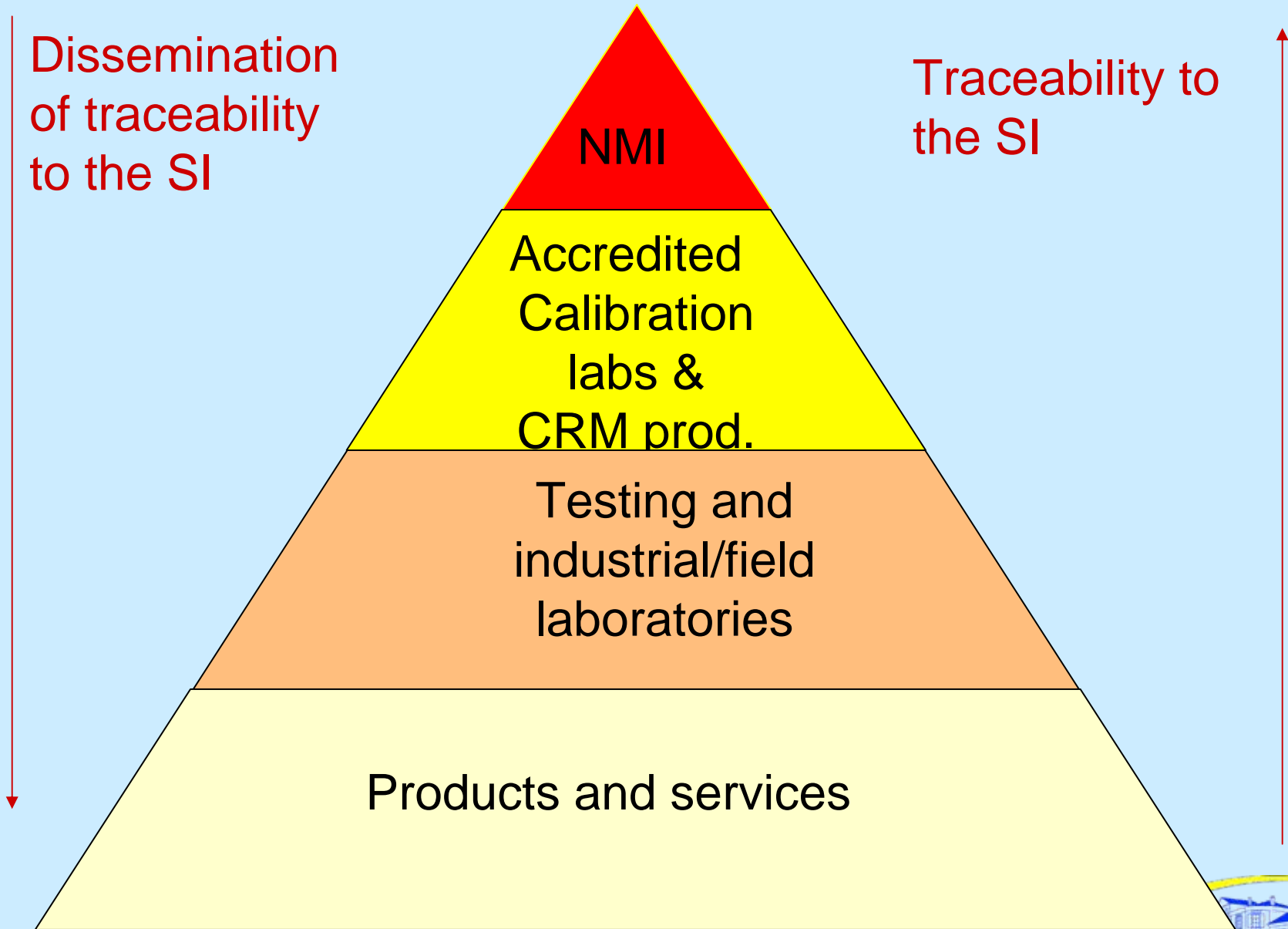
Metrological traceability

- ✓ Traceability to the SI or if not (yet) possible to another internationally agreed reference (e.g. hardness, pH, WHO International Units)
- ✓ Globally recognized, reliable and comparable measurement values with a stated measurement uncertainty, traceable to long term stable measurement standards (Trueness)
- ✓ Applicable to all fields of measurements, analysis and testing

National (regional) Metrology Institute - NMI

- ✓ Within living memory Government responsible for setting the national measurement standards
- ✓ NMI by law responsible for implementation of national measurement system
- ✓ Source of traceability to the SI for all users in the country (traders, industry, laboratories, society)
- ✓ Nucleus for national metrological infrastructure of accredited calibration and testing laboratories
- ✓ International recognition of **fit-for-purpose** national measurement standards and traceability obtained from that NMI (calibration/measurement certificates, CRMs)
- ✓ International/regional cooperation with other NMIs

The National Metrological Infrastructure



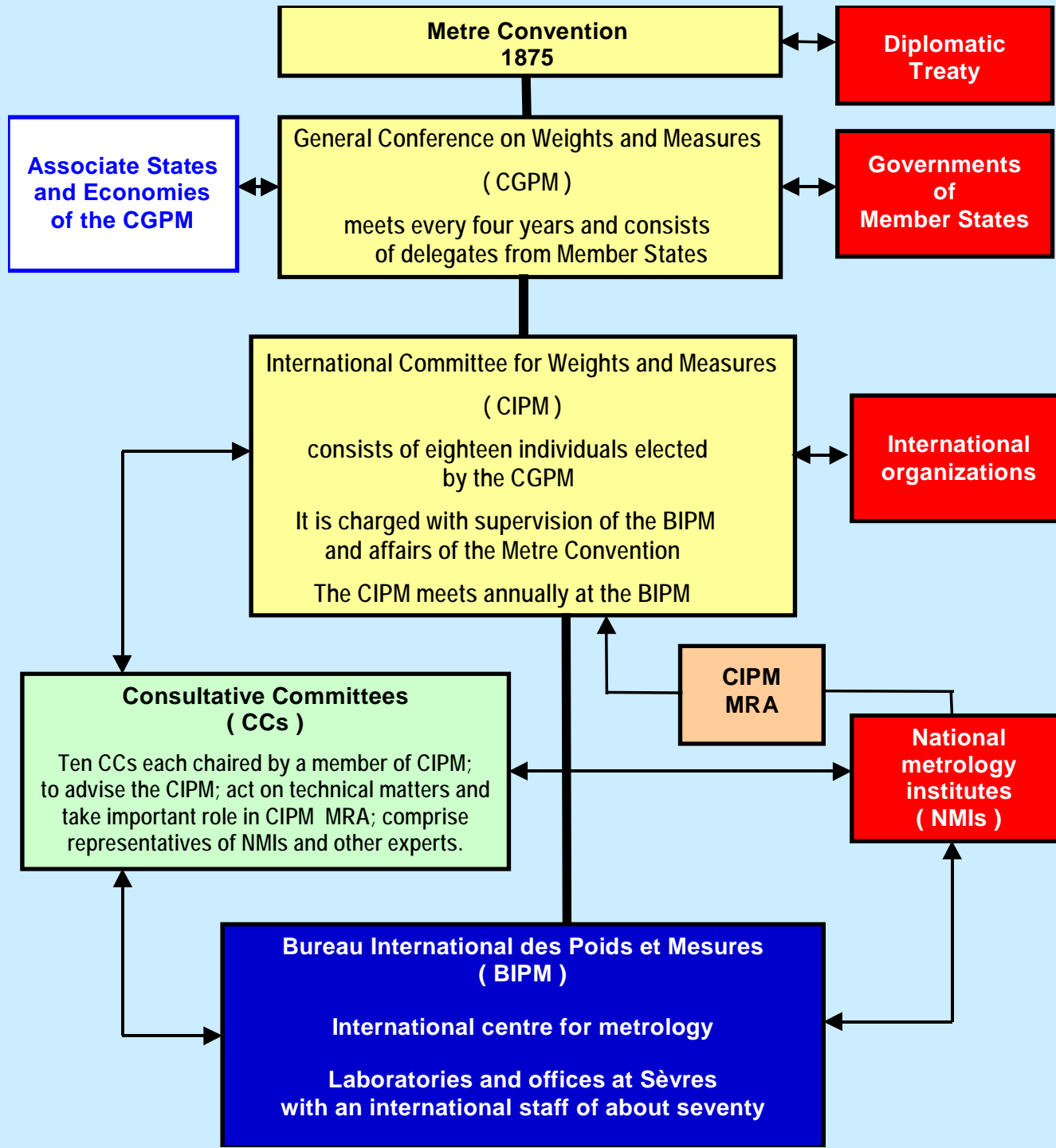
Services to be delivered by National Metrology Institutes and other Designated Institutes

- Calibration and capability to assign values to samples
- Certified Reference Materials (production, certification)
- Reference value assignment of Proficiency Testing samples (own PT schemes and/or third party PT schemes)
- Validation of measurement methods/procedures
- Delivering traceability to industry and ILAC Arrangement accredited “calibration” and testing laboratories, CRM producers and PT providers
- Delivering traceability to sector specific reference laboratories (clinical and food reference laboratories)

Establishing worldwide comparability through traceability

- “Metre Convention” Treaty (1875)
- Inter-Governmental Organization BIPM
- Member States (53) and Associate countries and economies (36) (March 2009)
- General Conference of Weights and Measures - CGPM
- International Committee for Weights and Measures - CIPM
- 10 Consultative Committees (units, physics, (bio-)chemistry)
- Headquarters BIPM in Sèvres, France
- CIPM Mutual Recognition Arrangement - CIPM MRA





Consultative Committee for Amount of Substance – CCQM - Metrology in Chemistry

Aim and tasks

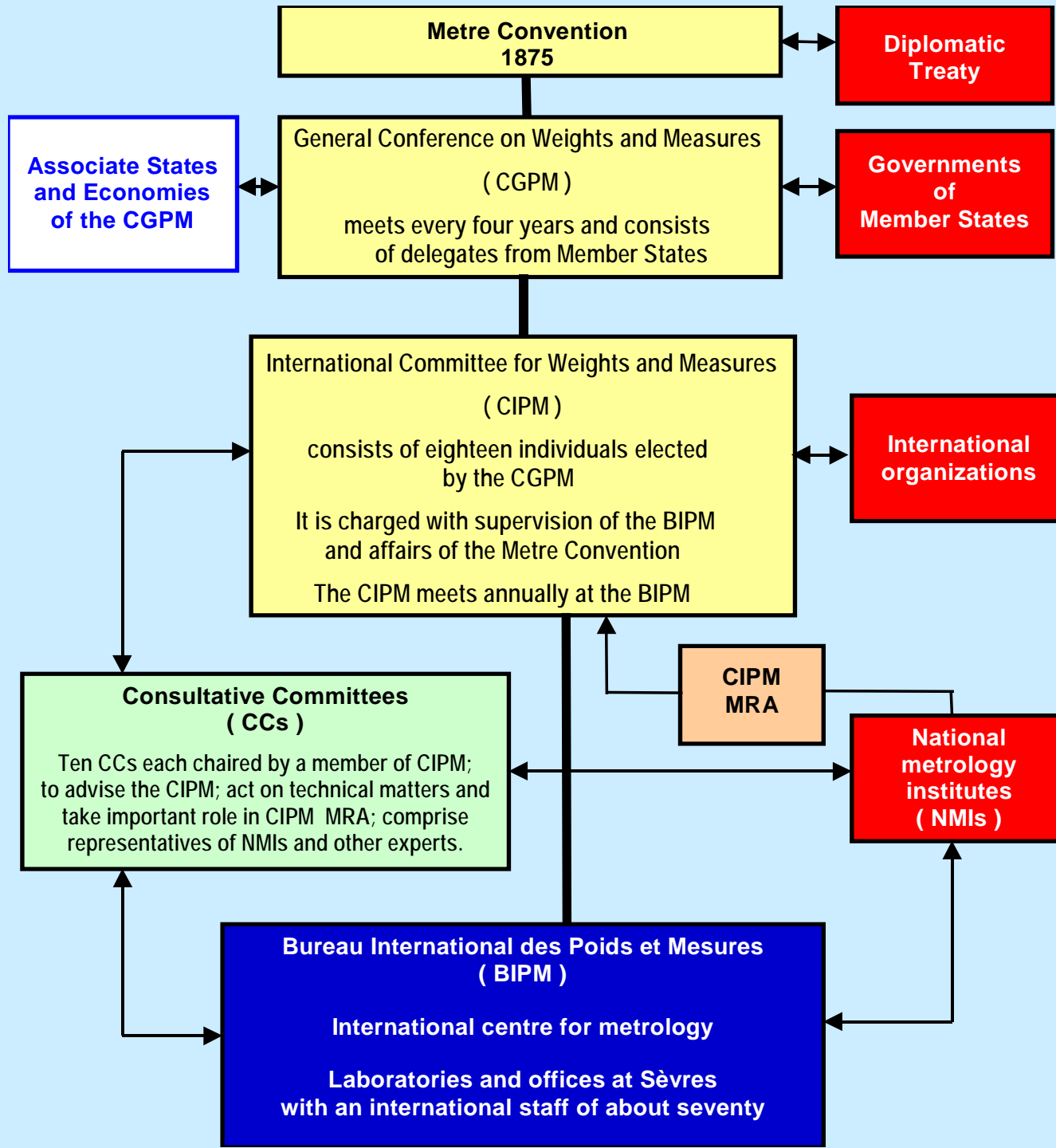
- To establish **worldwide comparability**, through
- **Traceability to SI**, or if not (yet) possible to other internationally agreed references, by
- Development of **primary and other methods of higher order**, databases and
- **Primary (pure) reference materials** and
- **Validation** of traceable methods/measurement uncertainty
- To organize **Pilot study comparisons** and **Key Comparisons**
- **To liaise with all stakeholders**
- To contribute to the establishment of a globally recognized system of national measurement standards and facilities and the implementation of the **CIPM MRA**
- To advise the CIPM and the BIPM on metrology in chemistry

CCQM - Metrology in Chemistry

- **Cooperation with other international organizations**
 - IAEA, WMO, WHO (NIBSC), Codex Alimentarius Commission, Inter Agency Meeting
 - IFCC, JCTLM, WADA (World Anti Doping Agency)
 - Pharmacopeia, USP, etc.
 - ILAC, ISO REMCO, IUPAC, CITAC, IMEKO, AOAC-I
 - IAFS (International Association of Forensic Sciences), ENFSI (European Network of Forensic Science Institutes)
 - Sector specific organizations (e.g. IDF, IOVV, IOOC)

International acceptance of calibration and measurement results issued by NMI and DIs

- Need for reliable, comparable and traceable, calibration and measurement results
- Carried out by credible, reliable calibration, measurement and CRM laboratories
- Globally recognized and accepted
- Require transparent system of accreditation and/or peer assessment (ISO/IEC 17025:2005 and ISO G 34)
- Compliant with regulations
- To be used by the regulators
- **Once measured/tested, everywhere accepted**



The CIPM Mutual Recognition Arrangement

- Mutual recognition of national measurement standards and of calibration and measurement certificates issued by NMI's (and other designated institutes) (covers >95% of world trade)
- Now signed by a large and increasing number of NMI's and other designated institutes (some 205), acting as NMI's for certain quantities and measurement ranges, of about 81 Member States and Associate Economies and 2 international organizations (IAEA and EU – JRC IRMM and JRC Ispra) (See **Appendix A**)
(soon also to be signed by the WMO)

The CIPM Mutual Recognition Arrangement

- Based on results of key-, supplementary- and bilateral comparisons (**Appendix B**)
- Quality system in place in conformity with ISO/IEC 17025 and ISO Guide 34
- Quality system assessment by international RMO review, accreditation and/or on-site peer review
- Regional and inter-regional review of claimed calibration and measurement capabilities

Appendix C of the CIPM MRA

- Published are the Calibration and Measurement Capabilities (CMCs), that are the services of the NMIs and other designated institutes, which are normally delivered to the customers

* Analysing/measurement/calibration capabilities and/or

* CRM's delivered/sold to customers

Some 20 500 CMCs of which 4300 chemical, 3700 ionizing radiation, 12500 physical (Appendix C)

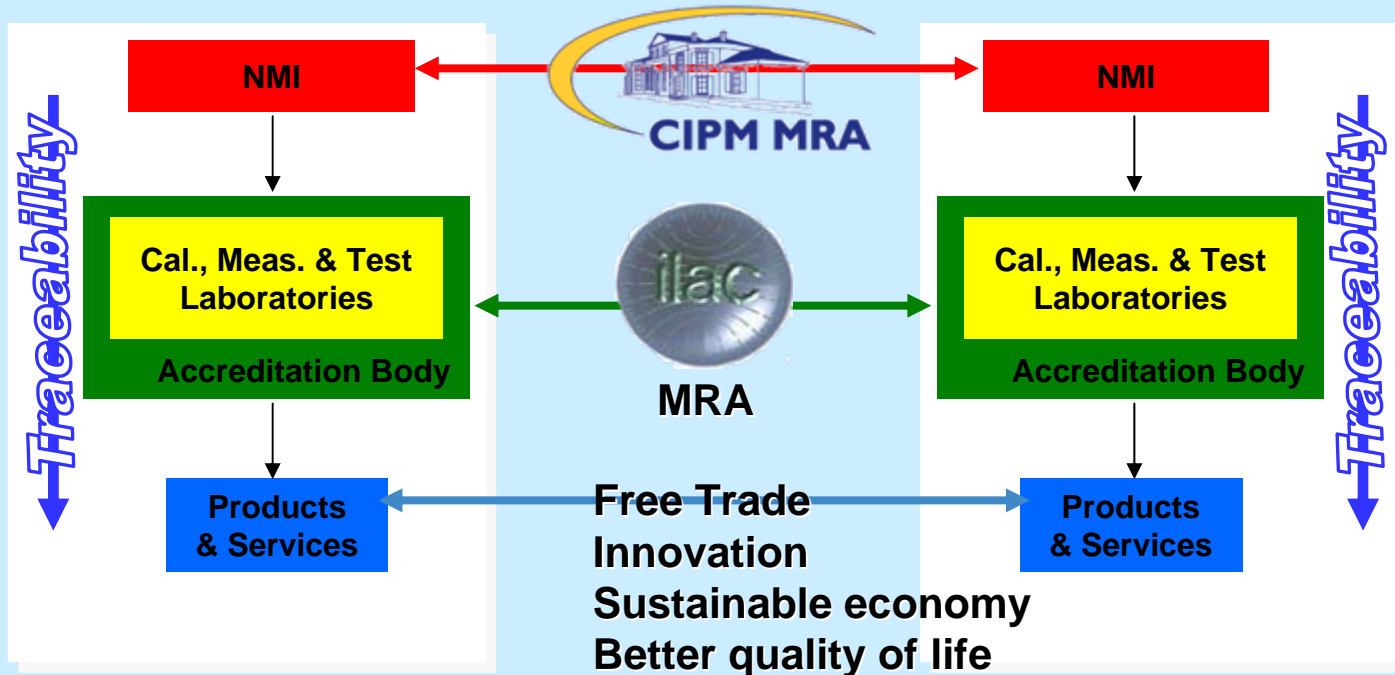
- Data Base – KCDB on www.bipm.org/kcdb
- Intelligent search engine

Establishing a national network of credible, reliable, recognized dissemination of traceability

- Top level cooperating under the Metre Convention
 - NMI's and other designated institutes
- Second level of accredited calibration laboratories and CRM producers under the ILAC Arrangement
 - traceable to NMI's and other designated institutes under the CIPM MRA
 - able to assign values to "in-house" reference materials
 - delivering Certified Reference Materials
- Third level of "field" testing laboratories
 - delivering reliable, traceable and internationally recognized measurement and test results

THE IMPORTANCE OF MEASUREMENT

A sound measurement system is fundamental in fields of science, production of goods and services, health, commerce, communications,...It creates the framework in which suppliers of products and services can demonstrate compliance with specifications within an internationally standardized system.



MSTQ is essential for strengthening export

The benefits for the country as a CIPM signatory

- ✓ National measurement standards/capabilities on the level suitable for the country
- ✓ Able to deliver **reliable and credible traceability to traders, industry, meas./testing labs, society**
- ✓ **Internationally recognized**; no duplication
- ✓ No refusal of (export) products on the basis of doubted measurement and test results (TBT)
- ✓ Basis for sustainable development of economy
- ✓ Basis for improved quality of life (food safety, health care, environment)

Thank you

www.bipm.org

