Bureau International des Poids et Mesures

The BIPM in the International Standards and Conformance Infrastructure

– with particular reference to economic value and impact

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Overview

- The Metre Convention (Metre Treaty)
- The International Bureau of Weights and Measures (BIPM)
- Objectives of BIPM in the 21st Century
- The International Infrastructure
- Value and impact
- Conclusion

The Metre Convention (Metre Treaty)

The Metre Convention (Metre Treaty) was signed on 20 May 1875 by 17 Foundation signatory States :

Argentina; Austria – Hungary; Belgium; Brazil; Denmark; France; Germany; Italy; Peru; Portugal; Russia; Spain; Sweden and Norway; Switzerland; Turkey; U.S.A.; Venezuela

(There are presently 54 member States and 37 Associates of the CGPM)

The Metre Convention

Objective:

To establish an international system for world uniformity of measurement to meet the needs of trade, commerce and society.

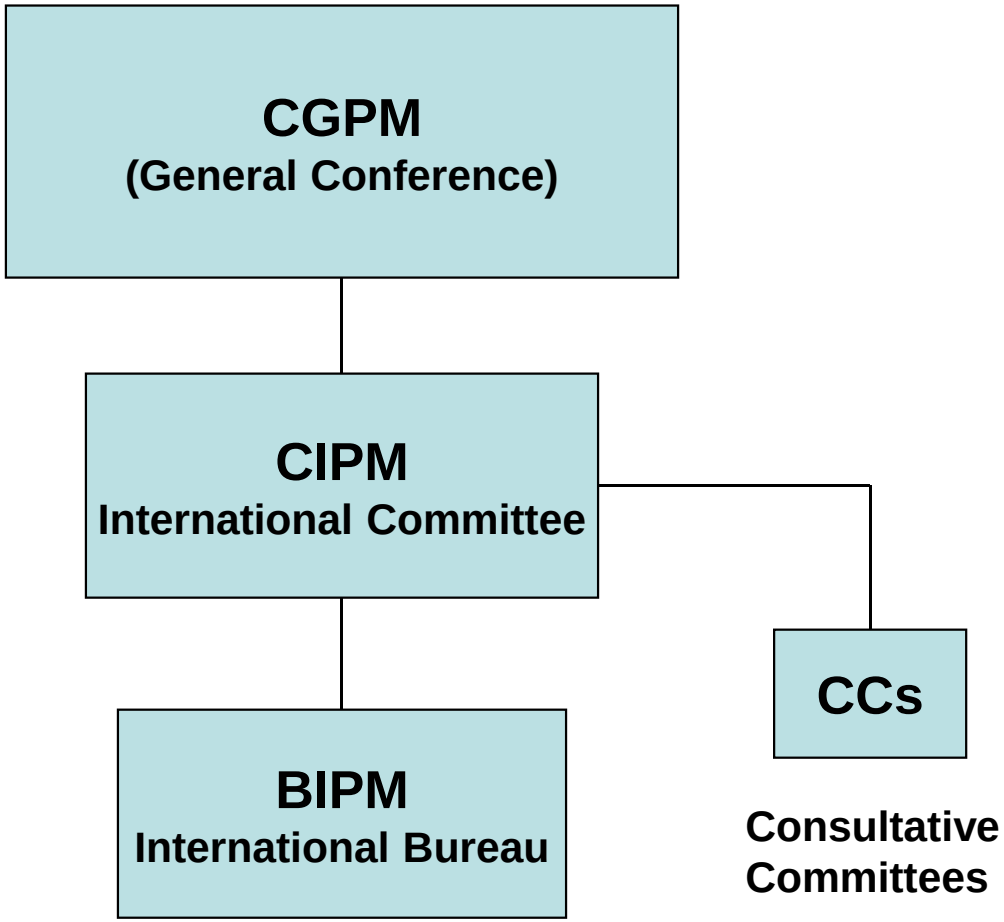
To achieve this it created:

- **The International Bureau for Weights and Measures (BIPM) as a “scientific and permanent” international Bureau.**

- **An International Committee for Weights and Measures to provide direction and supervision of the BIPM.**

- **A General Conference on Weights and Measures (CGPM), to meet on a regular basis.**

BIPM - Governance Structure



BIPM today

Located in Paris, France.

Financed by member States

Maintains Scientific Laboratories in areas of : mass, time, ionising radiation, electricity and chemistry

Staff: 70 – 75

Budget: $14M p.a. approx.

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The Pavillon de Breteuil today

Objectives of the BIPM in the 21st Century

- **Promote the SI system, engage with non-member States to extend international coverage.**

- **Undertake a limited range of research activities for the collective benefit of member States and maintain a scientific base**

- **Coordinate comparisons, maintain the Key Comparison data base.**

- **Facilitate information exchange, awareness**

- **Provide services that it alone is best positioned to provide.**

- **Engage with other international bodies in the best interest of achieving the objective of uniform measurement, OIML, ILAC, ISO, WMO, WHO….**

- **Collaborate with NMIs and Regional Metrology Organisations**

- **Support key forums on metrology**

BIPM – A unique Institution

BIPM is a unique institution:

- In a position to undertake tasks that NMIs and other institutions are not.
- The face of international metrology
- Unique role in defining, sustaining and promoting the SI System,
- Best placed to Coordinate comparisons between Member States
- Logical place to maintain a Key Comparison data base.
- Central body for information exchange, awareness between members
- Intergovernmental body best able to engage with other international organisations in the best interest of Members and uniform measurement.
- Undertakes research on a shared cost basis - benefits to Member States

Value to Member States

- **Dotation, based on UN Coefficients - Max: 9.5%; Min: 0.5%; Associate Min: 0.1%**

- **Effective International System of measurement to support trade, commerce, quality of life**

- **Focus for and representation of international metrology**

- **A seat at the International Table - Input to defining, sustaining, promoting the SI System,**

- **Coordinated international comparisons between Member States, travelling standards**

- **International recognition of CMCs, the Key Comparison data base.**

- **Expert advice, information exchange, new measurement standards development, advanced devices**

- **Access to research on a shared cost basis**

- **Free calibrations of standards for a limited range of services**

Standards and Conformance Infrastructure

International

- BIPM - The international measurement system (SI)
- International Laboratory Accreditation Cooperation - ILAC
- Certification Bodies - IAF
- OIML - Legal metrology
- Documentary standards writers – ISO, IEC, OIML …
- Regional Organisations - APMP, APLMF, APLAC, PAC, PASC ….

National

- National Metrology Institutes, Accreditation Bodies,
  Legal Metrology Organisations, Standards Organisations,
- Calibration Laboratories
- Regulators
- Testing Laboratories

Standards and Conformance Infrastructure

Infrastructure activities are largely underpinned by metrology

What is Metrology

"Metrology is the science of measurement and its application - Metrology includes all theoretical and practical aspects of measurement, whatever the measurement uncertainty and field of application". *VIM 3rd Edition, JCGM 200:2008*

Metrology - impact is far reaching

- International and domestic trade
- Climate change
- Sustainable environment
- Health
- Transport
- Emerging technologies
- Carbon Economy
- Security
- Drugs
- Other

Economic Impact of Metrology

- **Difficult to quantify**
- **Over the years there have been many studies commissioned**
- **An early study suggested that in a developed economy metrology contributed 3 – 6 % of the economy's GDP.**
- **Case studies in specific areas have been carried out**
- **Case studies on specific activities have been reported**
- **All case studies indicate ROI > 1 and in many cases >> 1**

Economic Impact of NMIs

- **Even more difficult to quantify**
- **NMIs provide the basis for metrology in a national technical infrastructure**
- **NMIs are usually funded by governments**
- **Often required to bid for or justify funding based on cost/benefit to the economy.**

Economic Impact of an NMI

- **International case studies can be used - limited value**

- **Comparative expenditure to maintain an effective NMI: 40 – 70 ppm of GDP?**

- **Usually has to come down to a specific argument relevant to the economy**

- **Cost of not having an NMI**
  - **lack of local measurement traceability,**
  - **difficulty in gaining international acceptance of testing**
  - **reduced opportunity for effective and timely testing at source**
  - **impact on trade,**
  - **potential to become a dumping ground**
  - **food safety**
  - **environmental issues, etc**

Conclusions

- BIPM is a critical element in the international technical infrastructure
- The Metre Convention is a cost effective way of maintaining an international measurement system
- Significant benefits to member States
- Economic impact of metrology is large but difficult to quantify
- Cost/benefits of NMIs in a national infrastructure largely based on arguments relevant to the specific economy.

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Thank you