EURAMET

Developing its New Role in European Metrology

Wolfgang Schmid, EURAMET Secretary

Simposio de Metrología, Querétaro, México

22 – 24 October 2008

EURAMET
European Association of National Metrology Institutes

OUTLINE:

Regional Metrology Organisations (RMO)

The European situation: From EUROMET to EURAMET

European Metrology Research Programme – EMRP

Cooperation in Developing National Metrology Infrastructure

Conclusions and Outlook

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Regional Metrology Organisations (RMO) …

… coordinate the collaboration between

National Metrology Institutes (NMI)

within a region

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Major responsibilities of an NMI

- Develop and maintain national measurement standards
- Establish traceability of these standards to the SI
- Ensure the equivalence of the national measurement standards to those of other countries
- Disseminate the SI through calibrations to industry, society and science
- Knowledge transfer to industry
- Provide advice to government and society
- R&D for improving national measurement standards, development and validation of new measurement methods

Regional Metrology Organisations (RMOs)

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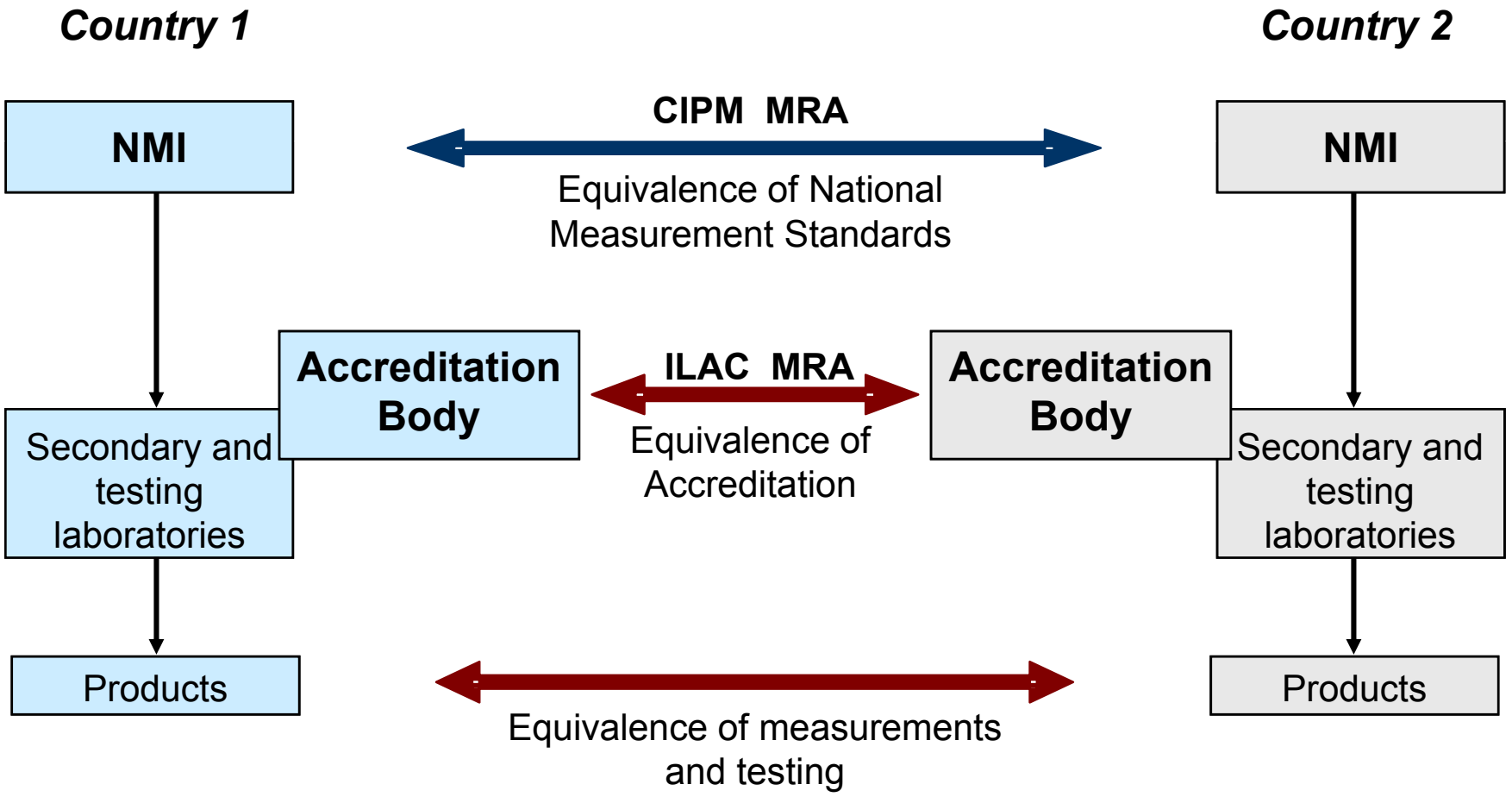
Responsibilities of an RMO

- Facilitating traceability to primary realisations of the SI
- Coordination of inter-comparisons of national measurement standards
- Mutual review of technical competencies and quality systems
- Cooperation in metrology research and development
- Joint training and consultation
- Sharing of technical capabilities and facilities

Equivalence of Measurements



Reconnaissance mutuelle

des étalons nationaux de mesure
et des certificats d'étalonnage et de mesurage
émis par les laboratoires nationaux de métrologie

Paris, le 14 octobre 1999

Mutual recognition

of national measurement standards
and of calibration and measurement certificates
issued by national metrology institutes

Paris, 14 October 1999

Comité international des poids et mesures

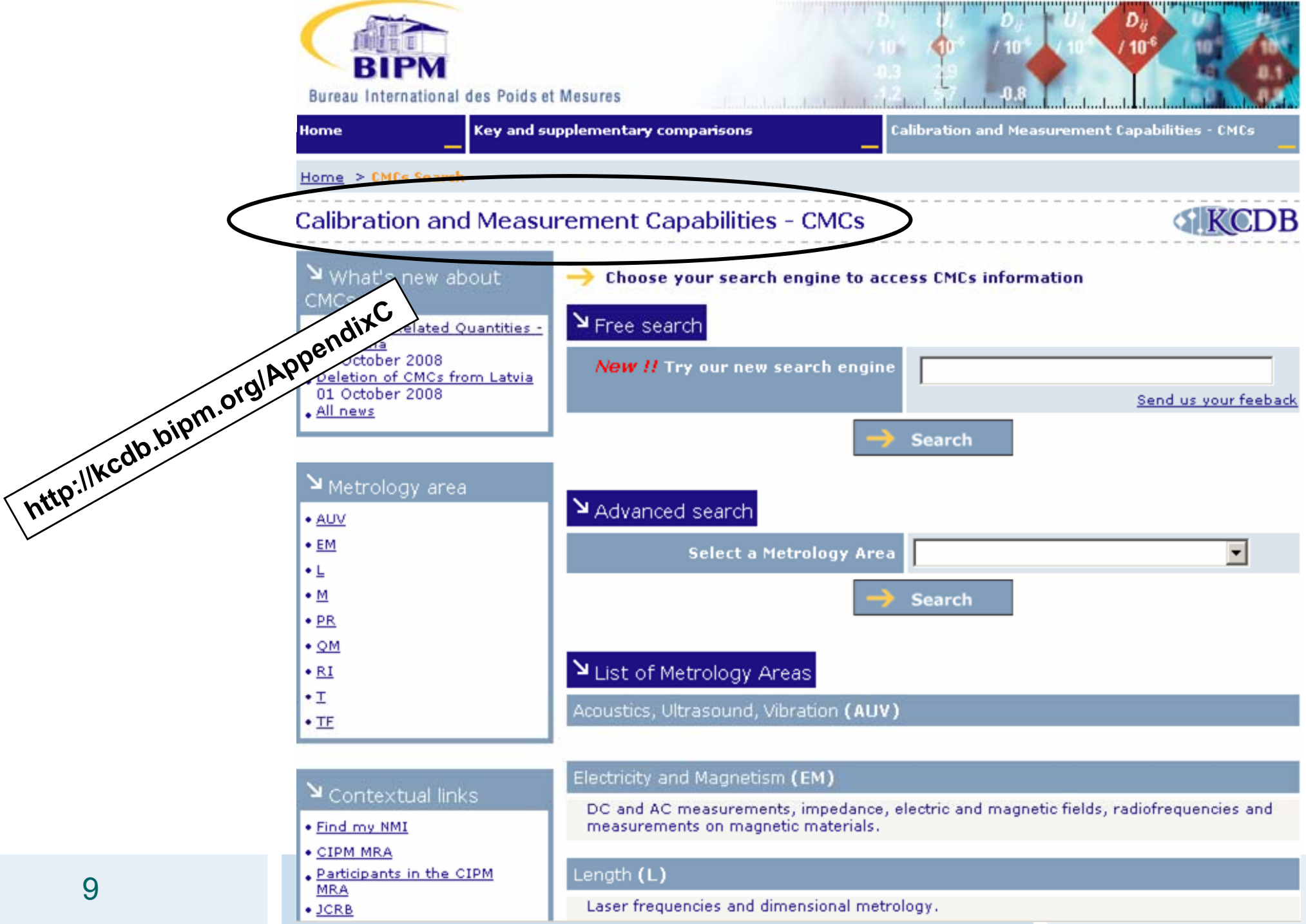
Bureau international des poids et mesures

Organisation intergouvernementale de la Convention du Mètre

The CIPM-MRA

(Mutual Recognition Arrangement)

- Establishes the degree of equivalence of national measurement standards
- Provides for mutual recognition of calibration and measurement certificates issued by NMIs
- Provides governments and other parties with a sound technical foundation for wider arrangements



http://kcdb.bipm.org/AppendixC

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EUROMET

European Collaboration in Measurement Standards

Established in January 1988

Based on an MoU

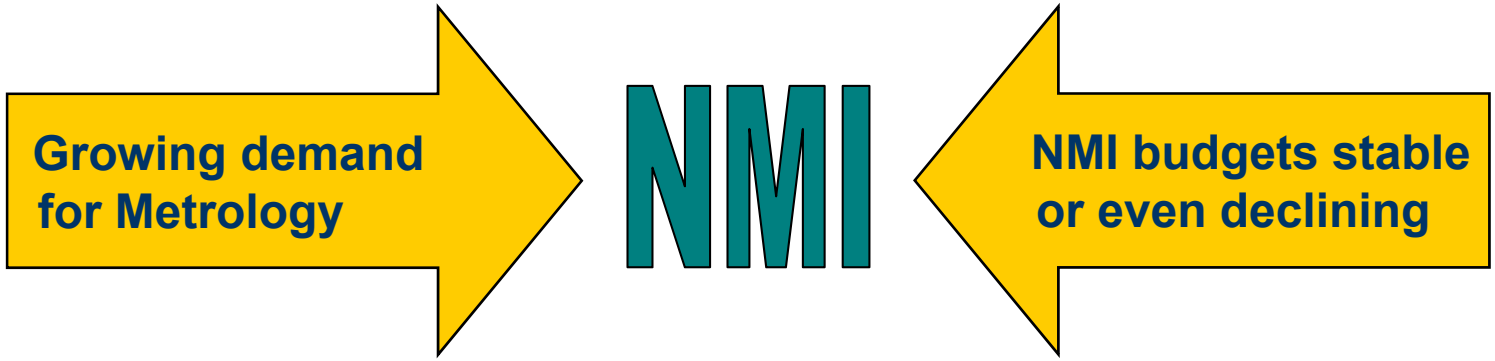
Substituted in July 2007 by EURAMET

Cooperation projects:

- Inter-Comparisons
- Traceability
- Research
- Consultation

No central planning or funding of projects

"Metrology Dilemma"



- **Traditional areas of industry**
  - becoming more complex
  - requiring broader measurement ranges and lower uncertainties
- **New areas of technology**
  e.g. nano-technology or biotechnology
- **Areas in which of metrology is increasingly recognised**
  e.g. chemistry, clinical medicine, food safety

?

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The MERA Project

"Planning the European Research Area in Metrology"

- Feasibility Study: 2002/2003
- How to address the evolving needs with not-growing national budget for metrology?
- Can the European "Metrology Dilemma" be addressed through closer collaboration?

Funded by the European Commission (EC)

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MERA-Project:

Scenarios for the future

European metrology infrastructure

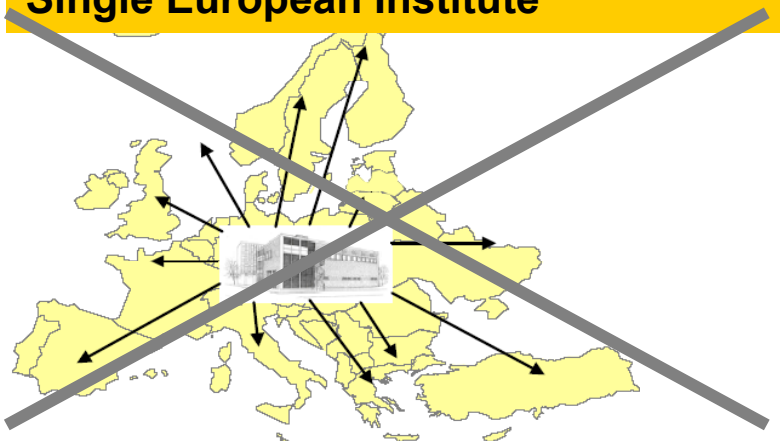
Comprehensive national provision

1

at present

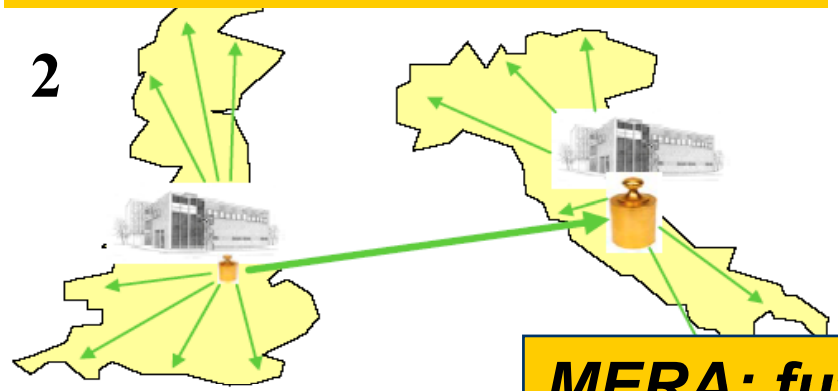
Single European Institute

4



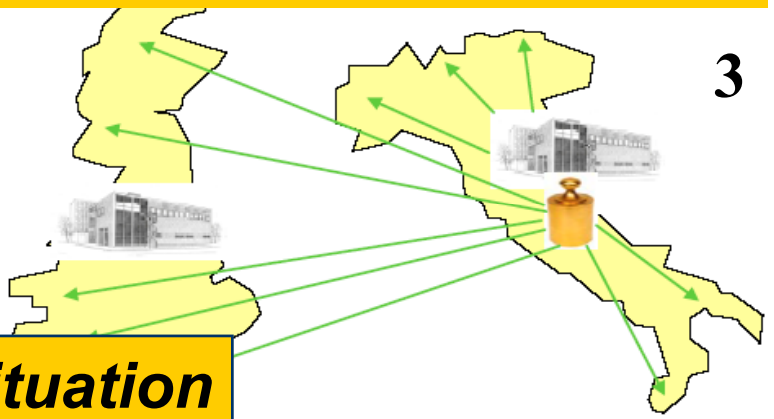
Selected standard holders

2



Specialized centers of excellence

3



MERA: future situation

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MERA Summary

- Evolution not Revolution
- Local delivery of services and expertise is valued
  - devolution not an issue for most NMIs
- High potential for increasing efficiency and efficacy via closer cooperation in R&D
- Arrangements are needed to enable strategic planning of longer term R&D collaboration
- Scope for improved planning and sharing of facilities
- EUROMET to evaluate its own structures

The iMERA Project

"**i**mplementing the **M**etrology **E**uropean **R**esearch **A**rea"

EC "ERA-NET" Coordinating Action

04/2005 to 12/2008

Major Objectives:

- Elaboration of an **EMRP** (= European Metrology Research Programme)
- Establishment of **Structures** for the execution of the EMRP
- **Funding** Aspects (ERA-NET Plus, A-169)
- Knowledge Transfer

Towards the legal entity

iMERA-Project:

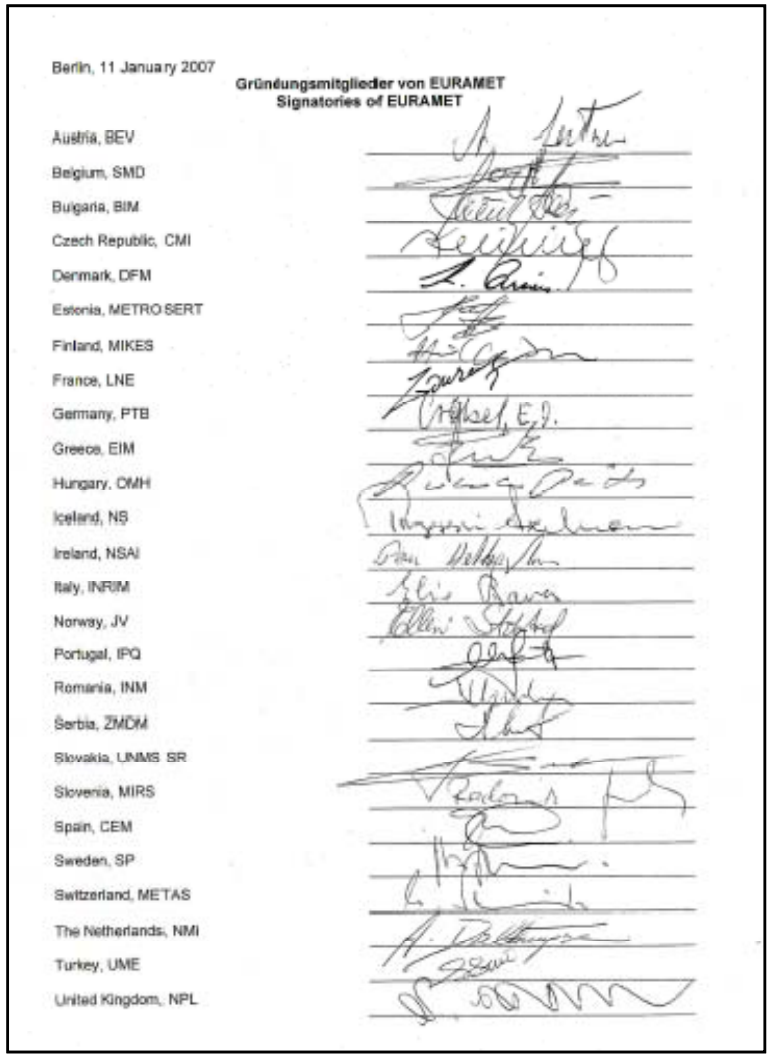
- Co-Funding of the EMRP by the European Commission
  requires a legal entity
- Association of Public Utility under German Law (e.V.)
  is an appropriate option

20th EUROMET General Assembly (May 2006) recommends

- to maintain a single comprehensive body
  to coordinate metrology in of Europe
- the creation of a legal entity suitable for both
  the operation of an EMRP
  and the other purposes of an RMO

Inauguration of EURAMET e.V.

11th January 2007
Berlin, Germany



Berlin, 11 January 2007

Gründungsmitglieder von EURAMET
Signatories of EURAMET

Austria, BEV
Belgium, SMD
Bulgaria, BIM
Czech Republic, CMI
Denmark, DFM
Estonia, METROSERT
Finland, MIKES
France, LNE
Germany, PTB
Greece, EIM
Hungary, OMH
Iceland, NS
Ireland, NSAI
Italy, INRIM
Norway, JV
Portugal, IPQ
Romania, INM
Serbia, ZMDM
Slovakia, UNMS SR
Slovenia, MIRS
Spain, CEM
Sweden, SP
Switzerland, METAS
The Netherlands, NMI
Turkey, UME
United Kingdom, NPL

Establishment of EURAMET

January 2007:

Inauguration of EURAMET

26 inaugural members,
(all remaining EUROMET members joint later)

April 2007:

Registration as a "not for profit" Association (e.V.) - Germany

June 2007:

EURAMET became the European RMO under the Metre Convention

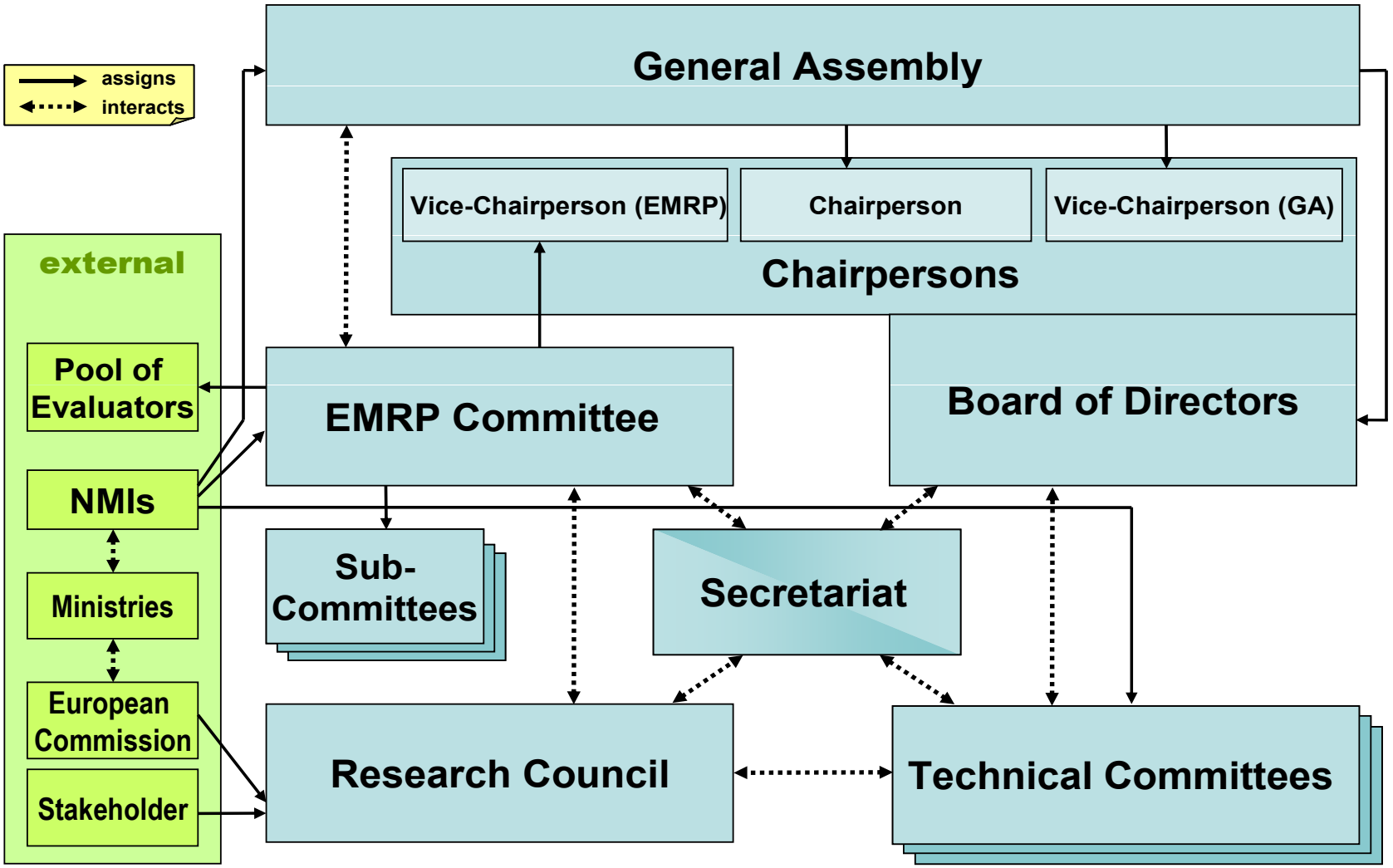
EUROMET MoU dissolved

Members:

33 European NMIs

Associates:

- IRMM
- 4 NMIs applying for membership
- 71 Designated Institutes


assigns
interacts
General Assembly
Vice-Chairperson (EMRP)
Chairperson
Vice-Chairperson (GA)
Chairpersons
external
Pool of Evaluators
NMIs
Ministries
European Commission
Stakeholder
EMRP Committee
Board of Directors
Sub-Committees
Secretariat
Research Council
Technical Committees

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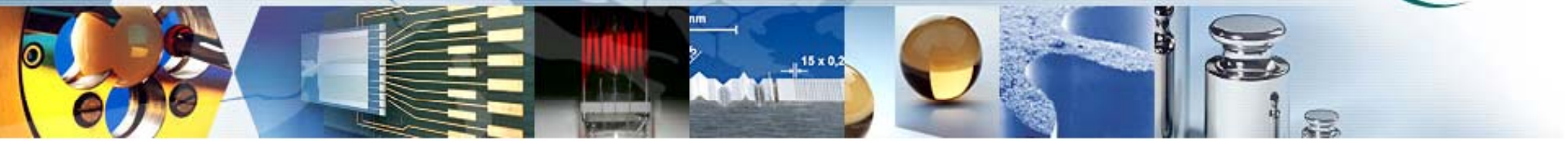

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- Homepage
- Profile
- Contacts
- General Assembly
- Board of Directors
- Technical Committees
- Projects
- Documents

EMRP
European Metrology Research Programme
Programme of EURAMET

More Information
http://www.euramet.org

EURAMET e.V.

The **European Association of National Metrology Institutes** (EURAMET) is a Regional Metrology Organisation (RMO) of Europe. It coordinates the cooperation of National Metrology Institutes (NMI) of Europe in fields like research in metrology, traceability of measurements to the SI units, international recognition of national measurement standards and of the Calibration and Measurement Capabilities (CMC) of its members. Among these tasks, EURAMET is responsible for the elaboration and execution of a European Metrology Research Programme (EMRP). EURAMET e.V. is a registered association of public utility under German law. **Since 1 July 2007 EURAMET e.V. is the successor of EUROMET.**

EURAMET in Short: Brief information on organisation and contacts.

European metrology was coordinated successfully over almost 20 years by EUROMET, the European Collaboration in Measurement Standards, based on a Memorandum of Understanding (MoU). New challenges for the European metrology, like aiming at a higher level of integration and coordination of metrology research in the framework of an EMRP, revealed the need to establish a legal entity for the coordination of European metrology.

The establishment of a legal entity has been prepared in the iMERA-Project. As a result, EURAMET e.V. was inaugurated on 11 January 2007 in Berlin, Germany.
The 21st EUROMET General Assembly in Teddington, UK, from 30 to 31 May 2007, took the decision to terminate the EUROMET MoU with effect from 30 June 2007. All activities and responsibilities as RMO (Regional Metrology Organisation) have been transferred to EURAMET e.V. with effect from 1 July 2007.

Login for restricted areas

Username:
Password:
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Latest News

2009-06-22 cfm, International Congress of Metrology 2009 »

2009-02-11 GAS2009 »

2008-11-12 IMEKO TC 11: International Symposium »

2008-11-06 BioFuels Met 2008 »

2008-10-22 CENAM, Simposio de Metrologia 2008 »

2008-10-06 6th EURACHEM

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Challenges for EURAMET …

- Executing the EMRP
- Inhomogeneous structure of members and …
- … diversity of their needs and expectations to EURAMET
- Growing number of Members and Associates
- Integration of Designated Institutes
- Guarantee reliability of a constantly growing number of CMCs

… and some approaches for solution

- Permanent structures
  - General administration: EURAMET secretariat
  - Administration of CIPM MRA tasks
  - EMRP Administration
- Clearly defined legal structures and relationships
- Central and flexible budget
- Cooperation in “Facilitating National Metrology Infrastructure Development”
- Mobility of NMI staff (guest researcher, secondments to secretariat)

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EURAMET research in numbers

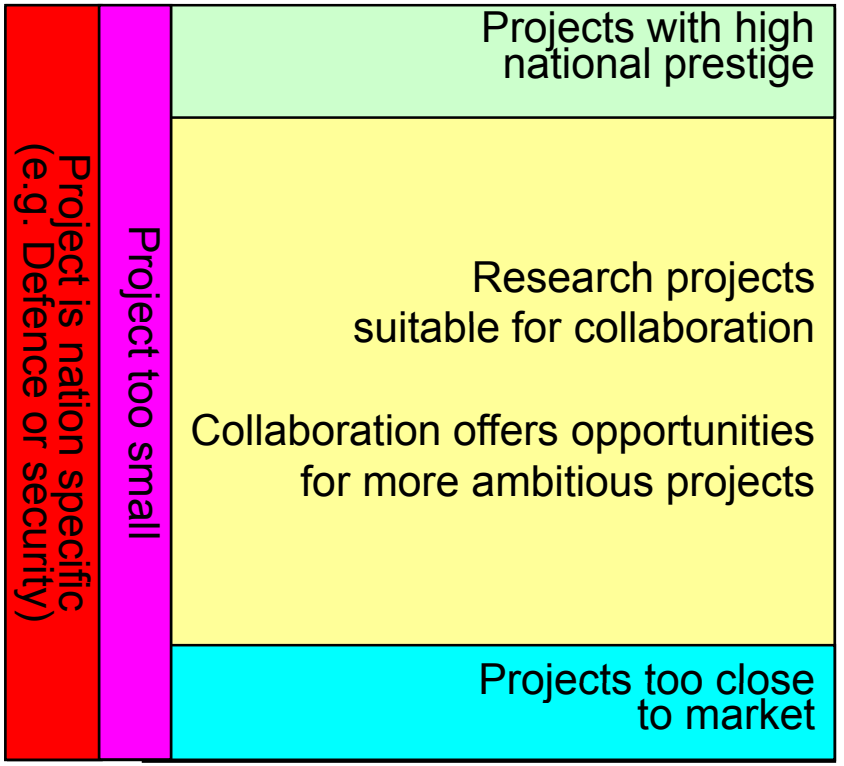
33 EURAMET members …

… employ about 4000 persons

About 2000 persons work on R&D activities

Spending about 200 M€ per year on R&D (50% of total budget)

But only a fraction of the R&D activities are suitable for collaboration (~ 20 %)



Structure of the EMRP

Document available on:
www.euramet.org

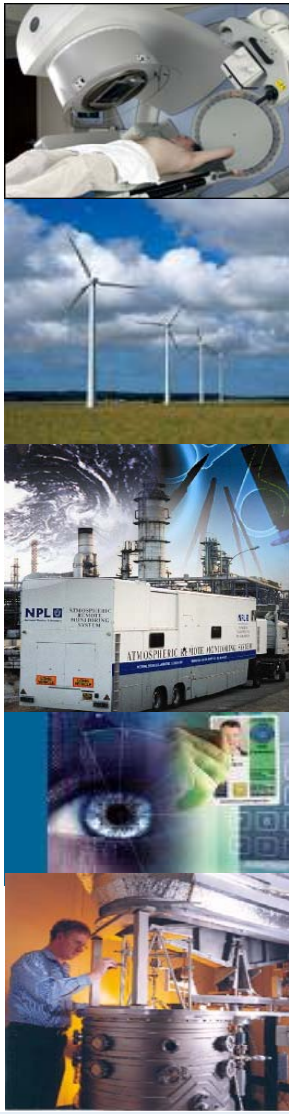
Grand Challenges

- Health
- Energy
- Environment
- New technologies (nano-sciences, security, etc.)

R&D for fundamental and applied metrology

- Fundamental metrology
- Focused single discipline
- (including SI, Fundamental Constants, Biotechnology, Materials)

Capacity Building and KT



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Executing the EMRP: iMERA-Plus

First step: **iMERA-Plus**, **an ERA-NET Plus programme**

38 participating institutes from 20 European states

65 M€ funding volume, 1/3 co-funding European Commission

Thematic areas:
- Dimensional Metrology
- Electromagnetic Metrology
- Metrology for Health
- New definition of SI units

January 2008: 21 Joint Research Projects (JRP) launched

iMERA-Plus: Call & Selection Process

Expressions of Interest
Submission of ideas and capability by NMIs and DIs
405 "areas of interest" from 44 organisations

Joint Research Projects (JRP) development
Scientists sift, focus and create consortia, write proposals

39 JRP proposals submitted

Review Conference
Independent joint evaluation – peer review
Ranked list of JRPs proposed for funding

Oversight:
Commission formal observer
Independent "Research Council" - provide "Opinion" to EC

Under Governance of the EMRP-Committee

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Characteristics of iMERA-Plus JRPs

- Collaborative projects selected by independent experts based on excellence criteria
- Coordinated research to avoid unnecessary duplication
- Create critical mass beyond the capabilities of a single NMI
- Should lead to „Centers of Excellence“ and help to distribute workload among European NMIs

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21 JRPs accepted for funding

SI & FUNDAMENTAL	T1.J1.1	e-MASS	The watt balance route towards a new definition of the kilogram
	T1.J1.2	NAH	Avogadro and molar Planck constants for the redefinition of the kilogram
	T1.J1.3	REUNIAM	Foundations for a Redefinition of the SI base unit Ampere
	T1.J1.4	Boltzmann constant	Determination of the Boltzmann constant for the redefinition of the kelvin
	T1.J2.1	OCS	Optical clocks for a new definition of the second
	T1.J2.3	qu-Candela	Candela: Towards quantum-based photon standards
HEALTH	T2.J02	Breath analysis	Breath analysis as a diagnostic tool for early disease detection
	T2.J04	Regenmed	Metrology on a cellular scale for regenerative medicine
	T2.J06	Brachytherapy	Increasing cancer treatment efficacy using 3D brachytherapy
	T2.J07	EBCT	External Beam Cancer Therapy
	T2.J10	TRACEBIOACTIVITY	Traceable measurements for biospecies and ion activity in clinical chemistry
	T2.J11	CLINBIOTRACE	Traceability of complex biomolecules and biomarkers in diagnostics effecting measurement comparability in clinical medicine
LENGTH	T3.J1.1	Nanoparticles	Traceable characterization of nanoparticles
	T3.J1.4	NANOTRACE	New Traceability Routes for Nanometrology
	T3.J2.2	NIMTech	Metrology for New Industrial Measurement Technologies
	T3.J3.1	Long distance	Absolute long distance measurement in air
ELECTRICITY & MAGNETISM	T4.J01	Power & Energy	Next generation of power and energ
	T4.J02	NanoSpin	Nanomagnetism and Spi
	T4.J03	JOSY	Next gener plications
	T4.J04	ULQHE	Enabling u
	T4.J07	EMF and SAR	Traceable n and SAR for the Physical Agents Directive

More information on website:
www.euramet.org -> EMRP

Executing the EMRP: Article 169 (in preparation)

22 participating European states

Proposal for a 7 year programme of 400 M€, ½ co-funding by EC

Co-decision process: European Parliament & Council

Threats: - Funding issues with EC
- European Parliament Elections in 2009

Could launch end 2009

Article 169 (of the European Treaty)

'In implementing the multiannual Framework Programme, the Community may make provision, in agreement with the Member States concerned, for participation in research and development programmes undertaken by several Member States, including participation in the structures created for the execution of those programmes'

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Designated Institutes (DIs)

Institute which maintains national measurement standards, (further to the NMI)

DIs participate in the CIPM MRA and have CMCs

Benefits:

- Efficient use of national resources
- Specified institutes for non-traditional metrology areas
- Bring in their specific know-how to R&D projects

Present situation in EURAMET:

38 NMIs / 71 DIs

Challenges:

- Guarantee a uniform “metrological culture” in all institutes
- Efficient communication among all institutes

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Countries developing their metrology infrastructure

- EURAMET has many members from countries where the metrology infrastructure is still under development
- Sharing experiences and joint activities will support this process and will increase efficiency of our work
- South-East European NMIs have annual coordination meetings and joint activities:
  - Trainings, workshops
  - Comparisons
  - Joint QMS reviews

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TC-IM Focus Group on

"Facilitating National Metrology Infrastructure Development"

Established in June 2008

First meeting: Skopje, FYR Macedonia

November 27/29 2008

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Focus Group on

"Facilitating National Metrology Infrastructure Development"

Aims:

• Promotion and **development of the metrology infrastructure** in the countries of its members **by an increased cooperation** and collaboration to achieve concentration and a synergetic and efficient use of competences and resources.

• Facilitation and acceleration of the **integration of its member NMIs into EURAMET activities**.

• **Raising awareness** about the development in metrology and quality infrastructure in the countries.

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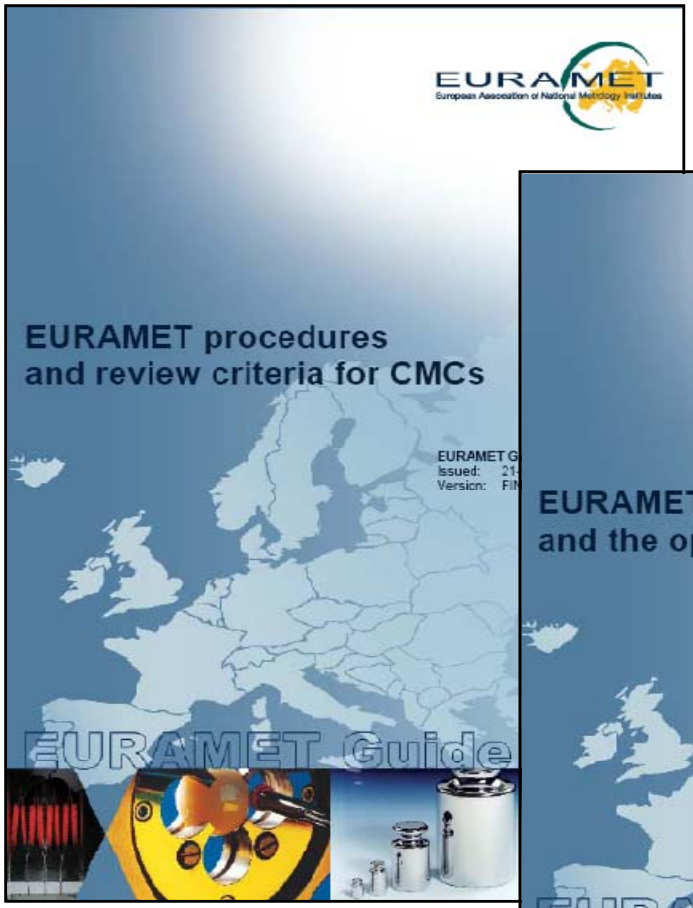
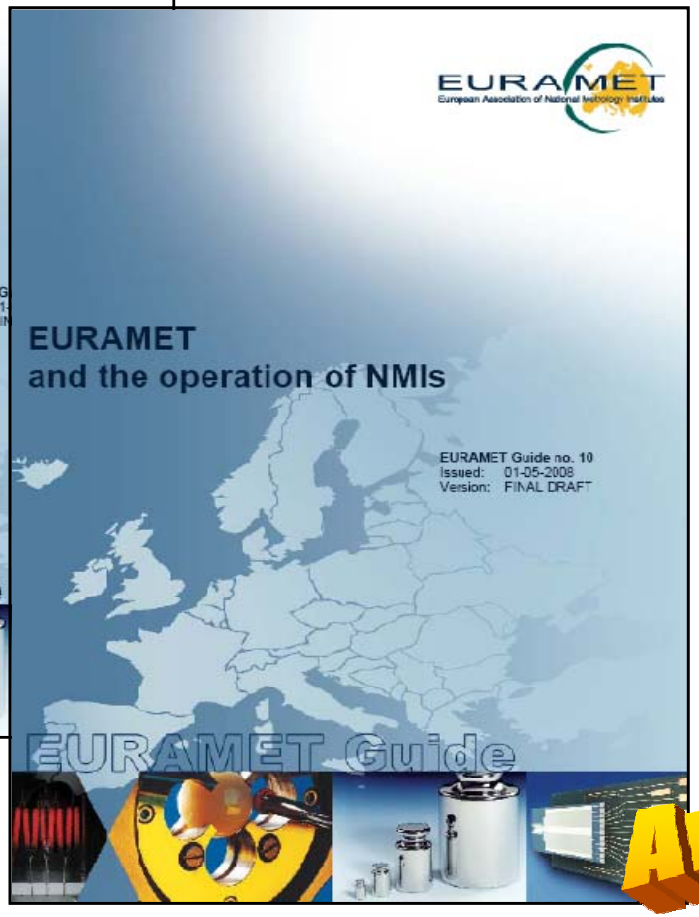
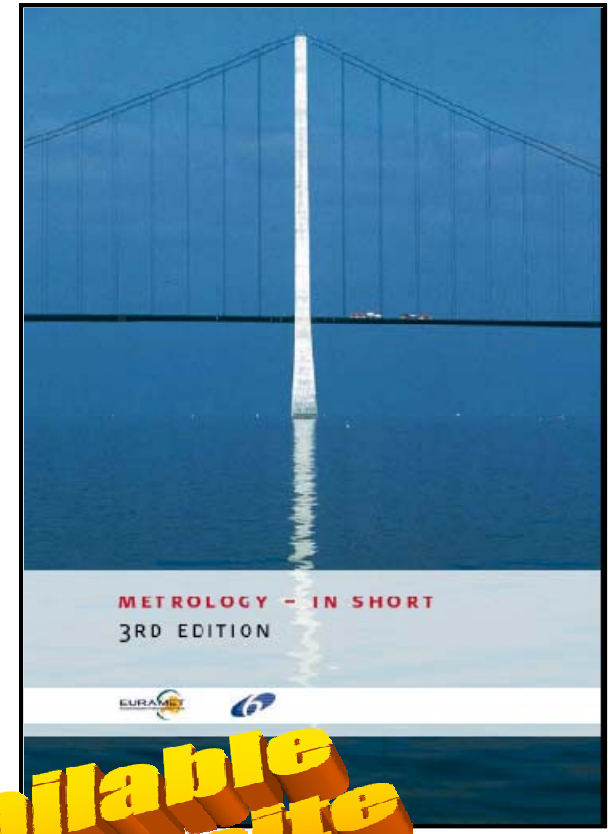
Envisaged activities of the Focus Group

- Joint trainings
- Assistance in planning of new labs and national standards
- Preparation for inter-comparisons
- Organisation of inter-comparisons to support CMCs
- Joint quality reviews
- Elaboration of guidance documents
- Elaboration of training courses
- and others …

Elaboration of Guidance Documents







Available on website

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N°	Calibration Guides	TC
01	Calibration of Stylus Instruments for Measuring Surface Roughness *	L
02	Calibration of Gauge Block Comparators	L
03	Calibration of Pressure Balances *	M
04	Uncertainty of Calibration Results in Force measurements *	M
05	Co-ordinate Measuring Machine Calibration *	L
06	Extent of Calibration for Cylindrical Diameter Standards	L
07	Calibration of Oscilloscopes *	EM
08	Calibration of Thermocouples	T
09	Measurement and Generation of Small AC Voltages with Inductive Voltage Dividers	EM
10	Determination of Pitch Diameter of Parallel Thread Gauges by Mechanical Probing	L
11	Guidelines on the Calibration of Temperature Indicators and Simulators by Electrical Simulation and Measurement	T
12	Guidelines on the Evaluation of Vector Network Analysers (VNA)	EM
13	Guidelines on the Calibration of Temperature Block Calibrators	T
14	Guidelines on the Calibration of Static Torque Measuring Devices	M
15	Guidelines on the Calibration of Digital Multimeters	EM
16	Guidelines on the Estimation of Uncertainty in Hardness Measurements	M
17	Guidelines on the Calibration of Electromechanical Manometers	M
18	Guidelines on the Calibration of Non-Automatic Weighing Instruments	M

Permission for translation of EURAMET documents can be obtained by the EURAMET Secretariat

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Conclusions and Outlook

- Legal entity EURAMET e.V. is full established and operational
- Permanent structures guarantee sustainability in the activities of EURAMET
- Legal status allows contracts with third parties for funding of major challenges
- Structures for coordinated research in Europe are created
- Ability of EURAMET to plan and execute a coordinated research programme has been demonstrated (iMERA-Plus)
- Larger research programme in preparation (based on A-169 co-funding)
- Challenge to integrate an increasing number of DIs in CIPM MRA and EMRP
- Cooperation for National Metrology Infrastructure Development is starting
- Visibility of EURAMET to stakeholders and politics has improoved

ACKNOWLEDGEMENTS

- EUROMET/EURAMET officials
- In particular to
  - Michael Kuehne, PTB, Germany — EURAMET-Chairperson
  - Arnold Leitner, BEV, Austria — EURAMET-Vicechair
  - Luc Erard, LNE, France — EMRP-Chair
  - Any Henson, NPL, UK — iMERA-Manager and EMRP-Manager
- Partners in iMERA, iMERA-Plus & A169
- Researchers of the iMERA-Plus JRPs
- European Commission

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THANK YOU

FOR YOUR ATTENTION

Wolfgang Schmid, EURAMET-Secretary

Secretariat:

Bundesallee 100, 38116 Braunschweig , Germany

secretariat@euramet.org

http://www.euramet.org

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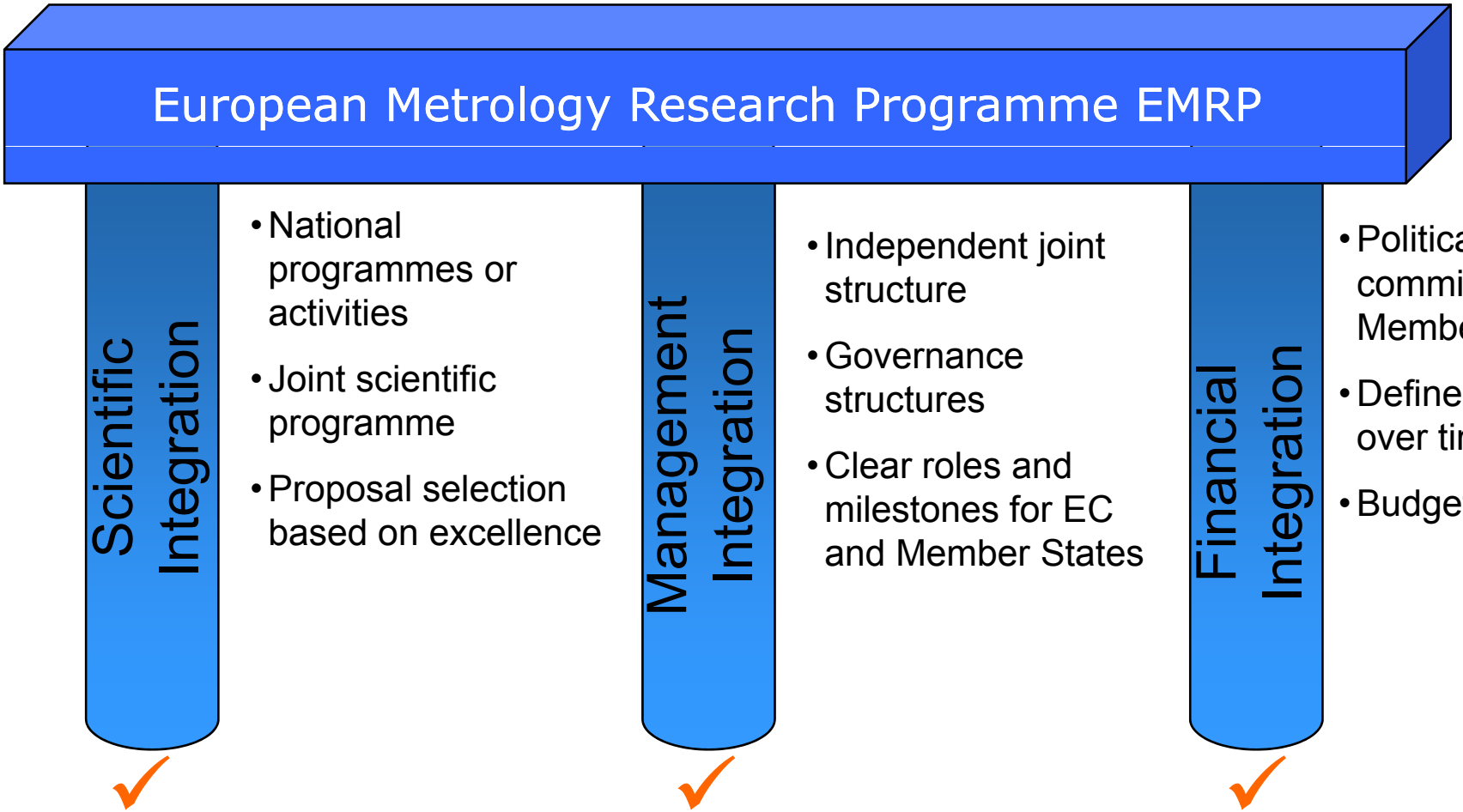
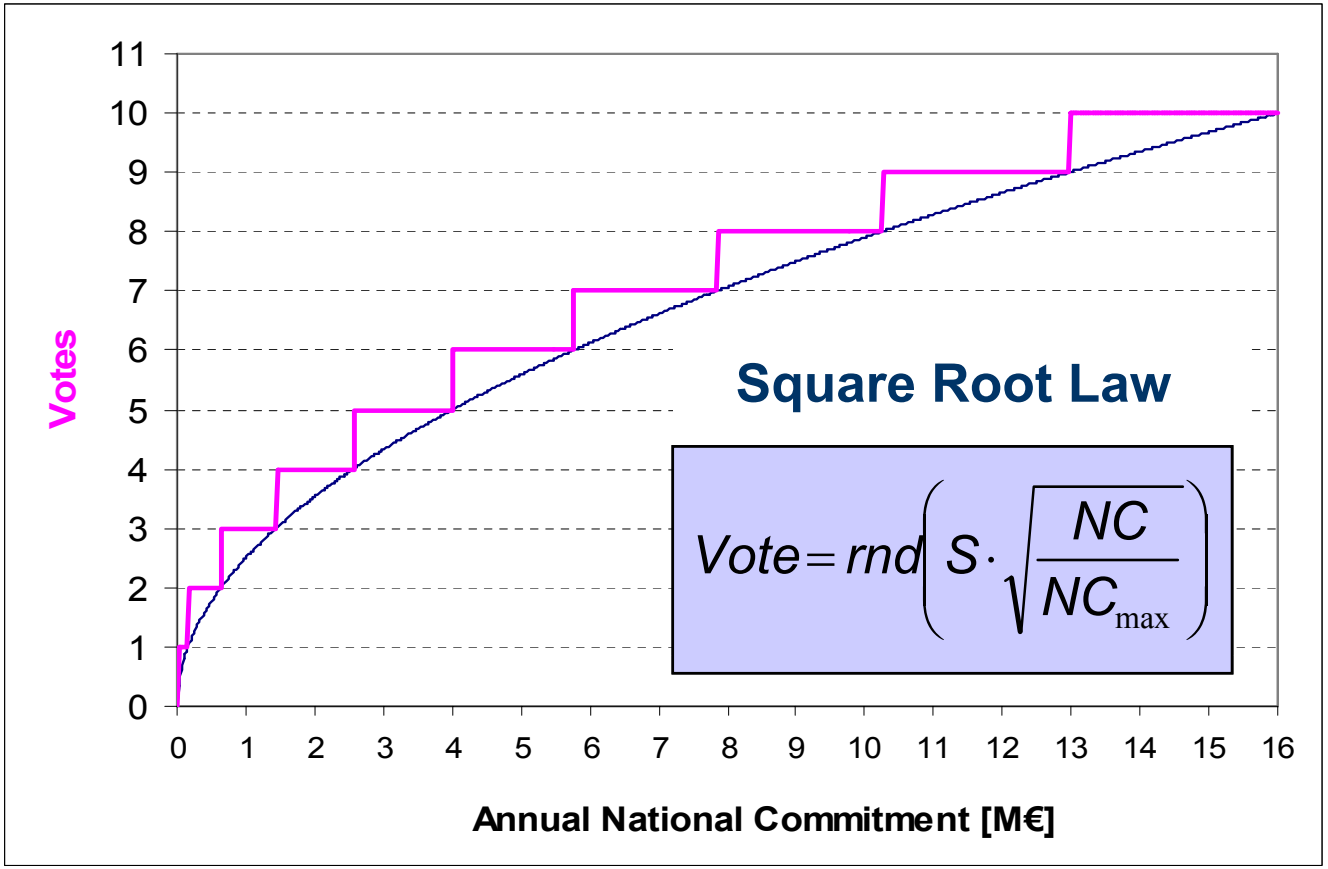
Preparing EMRP via Article 169 of the Treaty



Decision making in the EMRP-Committee

Principle:

- Based on objective input data, related to the EMRP (financial commitment)
- Flattening, more weight for the “smaller” players



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Diversity of EURAMET Members

Large NMI

PTB, Germany: 1700 employees

Small NMI

MNS-NMS, Malta: 3 employees

Focus on R&D

Participation in EMRP

Focus on services

Need for KT

Long experience in metrology

PTB, NPL more than 100 years

In process of establishment

Cyprus, Luxembourg, …

Centralised system (only the NMI)

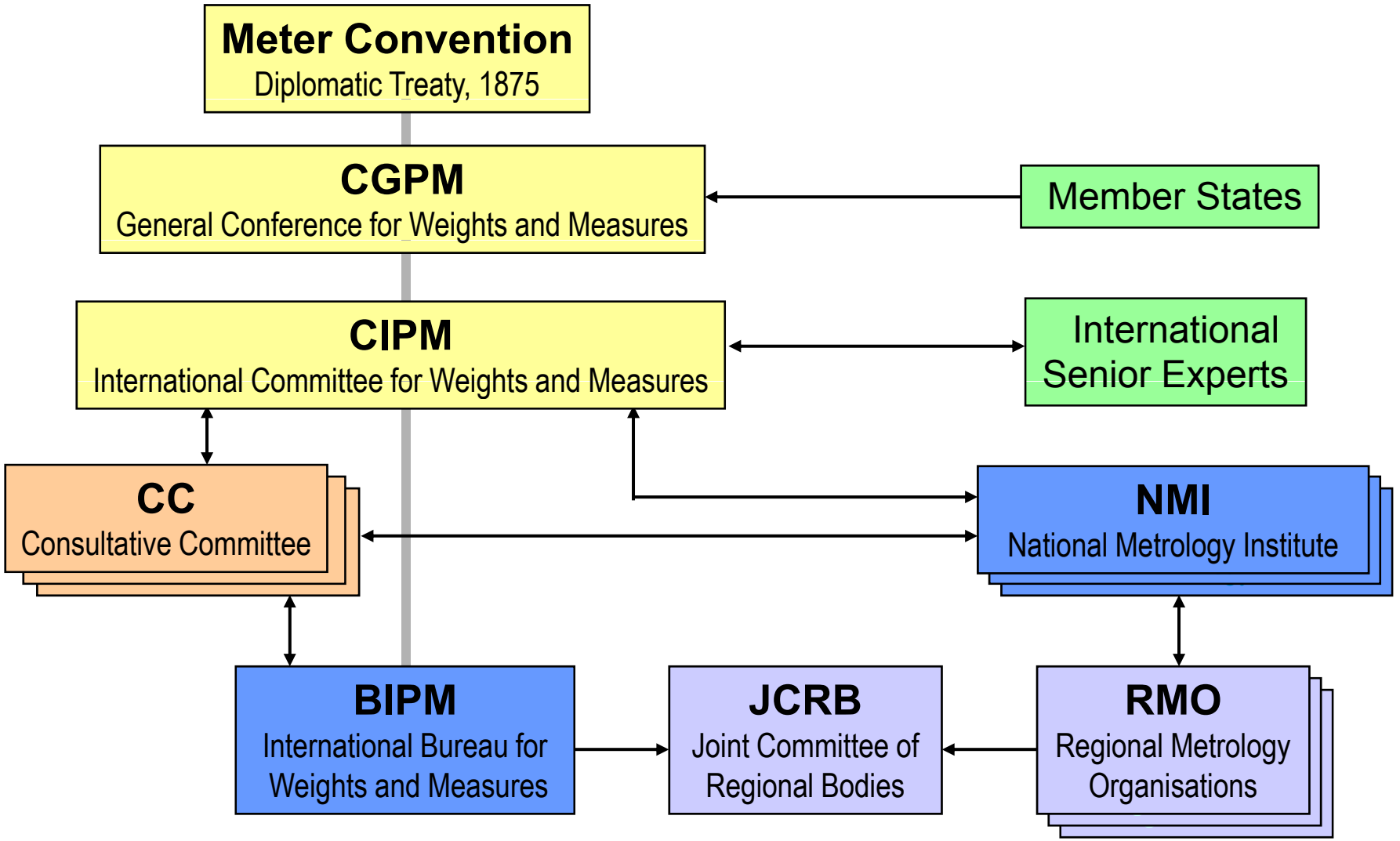
Netherlands: NMi VSL

Bulgaria: BIM-NCM

Network of laboratories

France: LNE + 10 DIs

Slovenia: MIRS + 6 DIs


Meter Convention
Diplomatic Treaty, 1875
CGPM
General Conference for Weights and Measures
Member States
CIPM
International Committee for Weights and Measures
International Senior Experts
CC
Consultative Committee
NMI
National Metrology Institute
BIPM
International Bureau for Weights and Measures
JCRB
Joint Committee of Regional Bodies
RMO
Regional Metrology Organisations