



## Introduction and Background

EURAMET, with a diverse membership composed of National Metrology Institutes (NMI) and Designated Institutes (DI) at all levels of development, has always encouraged cooperation and free exchange of information among its members. However, formal endorsement of capacity building, aiming to support and improve the technical capabilities of developing NMIs came in the year 2008 with the formation of the Focus Group on National Metrology Infrastructure Development (FGNMID) under the Technical Committee for Interdisciplinary Metrology (TC-IM). The FGNMID built upon the foundation laid by the PTB project on “Promotion of regional cooperation in South-eastern Europe in the field of quality infrastructure” and focused on organising training, comparison and workshop activities open to all EURAMET members.

Based on recommendations of the mid-term review of the European Metrology Research Programme (EMRP) in 2011, EURAMET included capacity building focused activities into planning for the second phase of the EC-funded research programme that eventually became the European Metrology Programme for Innovation and Research (EMPIR). The inclusion of new capacity building tools in EMPIR significantly broadened the means by which EURAMET supported the development of its members and marked the first time that EURAMET funded both through EU funding and directly through members’ cash contributions to EMPIR.

In late 2015, the EURAMET Board of Directors, approved the establishment of the Working Group for Capacity Building (BoD-WGCB) under its direct authority, indicating a greater level of commitment by EURAMET to capacity building efforts. Through the BoD-WGCB, EURAMET aims to “underpin the vision of a coherent, efficient, sustainable and integrated European metrology network”, as stated in the working group’s Terms of Reference.

EURAMET’s strategy recognises the need for capacity building and undertakes to further develop capacity building measures for EURAMET members, particularly for emerging and small Metrology Institutes and Designated Institutes. The support for capacity building is envisaged in the future metrology programmes as well.

This document aims to set out EURAMET’s strategy for capacity building which will guide all activities undertaken to develop the human, institutional and research capacity of EURAMET member NMIs and DIs in the years to come.

## Stakeholders

The stakeholders of EURAMET capacity building activities are:

### **Direct Stakeholders:**

- EURAMET NMIs and DIs
- EURAMET TCs, EMNs, WGs and other bodies
- BIPM and other RMOs



### **Indirect Stakeholders:**

- Industry and end users
- International and regional legal metrology organisations
- International and regional Quality infrastructure organisations
- European policy makers and National Governments
- Academic institutions

### **Vision**

An efficient, balanced and integrated European metrology infrastructure which meets national and European needs.

### **Mission**

Develop and implement effective and efficient capacity building instruments to

- Support EURAMET members in meeting their own national requirements for metrology services while taking into account EURAMET's strategy for an efficient, balanced, integrated European metrology landscape.
- support EURAMET members in developing the capability to contribute to an internationally competitive and recognised European measurement infrastructure

### **Capacity Building Instruments**

EURAMET deploys a wide range of instruments in support of capacity building from Joint Research Projects (JRP's) to E-Learning. These instruments are designed to facilitate knowledge transfer, allow experienced and less experienced NMIs to collaborate on developing capability and to foster the growth of research capacity in the emerging NMIs.

EURAMET shall seek to continually evaluate and improve existing capacity building instruments and may deploy other instruments as the need arises.

Short description of the instruments and Summary table with the objectives and activities for their short-and-long term realisation are given in annexes 1 and 2 and is subject of periodical update.

### **Objectives<sup>1</sup>**

**Support building the human and institutional capacity of member NMIs and DIs necessary to respond to the demands of indirect stakeholders.**

EURAMET's priorities for a balanced and integrated European metrology infrastructure should be taken as orientation.

EURAMET supports and implements knowledge transfer initiatives that aim to develop skills of its

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<sup>1</sup> EURAMET's CB objectives are in line with the strategic objectives identified in the EURAMET 2030 Strategy:

- Engagement of key stakeholders,
- Further develop co-operation in R&D,
- Supporting quality infrastructure in Europe and internationally,
- Increase influence with European policy makers and National Governments
- Deliver high value to members and associates,



member NMI/DI staff in subject areas identified as priorities for stakeholders while taking the need for a balanced European metrology landscape into account.

The main vehicle for the delivery of this objective is the Human and Institutional Capacity Building Plan (HI-CB Plan) that is assembled at the annual BoD-WGCB meetings and subsequently approved by the relevant EURAMET body. The plan consists of a list of short-term training courses and mentoring initiatives selected with input from WGCB members and Technical Committees, with an emphasis on subjects that are of concern to multiple NMIs/DIs. Training topics may be diverse, including subjects in technical areas, CIPM MRA, communications, NMI/DI management, reflecting the need to address all aspects of NMI and DI activities. Being identified as an urgent capacity building priority for the whole EURAMET landscape, a special attention will be given to CB for Metrology for digital transformation.

Over the long-term, a more regular, multi-year schedule of capacity building initiatives based on determined needs and in alignment with the CB strategy will be developed.

Capacity building activities may not only be interpreted as those aiming to develop the technical skills of existing staff at developing NMIs/DIs but also at supporting the development of young qualified staff for all EURAMET NMIs/DIs. Many institutes face challenges recruiting technical personnel ready to work in metrology laboratories. EURAMET will support NMIs and DIs with newly hired staff by offering technical courses to prepare them for work in the laboratory (e.g. in the form of summer schools). A cooperative approach across EURAMET to this issue will result in efficiencies for EURAMET members and will also introduce newly hired staff to their colleagues across EURAMET, perhaps setting the foundation for cooperation and interaction in other EURAMET activities and settings.

#### **Implement actions for developing or reinforcing member NMI/DI research capabilities**

The incorporation of a targeted programme in funded metrology research with the explicit aim of developing research capability gives NMIs/DIs the technical know-how to resolve challenges through research in a manner that benefits indirect stakeholders and embeds them into a Europe-wide network of collaborative research activity.

The instruments supporting this objective are specific joint research projects (JRPs) of “research potential” type and researcher mobility grants (RMG).

Over the long-term EURAMET will continue to incorporate CB activity aimed at enhancing research capacity into all EURAMET administered collaborative programmes and European Metrology Networks (EMN) when appropriate.

EURAMET will ensure that research outcomes are widely disseminated through Technical Committees and European Metrology Networks, and emerging NMIs/DIs are encouraged to take advantage of research programmes and mobility grants.

#### **Support EURAMET NMIs/DIs toward more effective participation in CIPM MRA processes & mechanisms thereby strengthening the quality infrastructure in Europe.**

Participation in CIPM MRA processes and mechanisms is an effective means by which EURAMET NMIs/DIs anchor themselves in a highly regarded and trusted system that requires strict adherence to relevant quality standards and provides international recognition of peer-reviewed calibration and measurement capabilities and an institutional framework to maintain international traceability of national standards to the SI. As EURAMET plays a vital role in the CIPM MRA, it also has an interest



in providing support, in cooperation with the BIPM, to all of its members to participate effectively in the CIPM MRA so that they may contribute to the strengthening of the quality infrastructure in Europe.

To this end, EURAMET will:

- Implement activities that aim to train member NMI/DI staff on the CIPM MRA and its various aspects (comparisons, peer-reviews, QMS implementation, CMC declarations, etc.) as the need is seen to arise.
  - Identify unfulfilled comparison needs to support member NMI/DI CMC claims and cooperate with relevant TC in their realisation. Support may be supplied through training in performing and piloting comparisons. Means may also be sought to expedite the comparison process
  - Prepare and encourage member staff to take part in CIPM MRA activities, e.g.:
  - Review of CMCs
  - Pilot interlaboratory comparisons
  - Take responsibilities in TC.
- **Support integration of all EURAMET members into EURAMET structures and activities**

EURAMET is committed to facilitating and accelerating the integration of member NMIs and DIs into EURAMET activities so that it functions like a true community of NMIs/DIs in which cooperation and information flow is achieved to the greatest extent so that the maximum impact may be derived from the metrology expertise in Europe to the benefit of all shareholders in European metrology.

To this end, EURAMET shall focus on capacity building activities that facilitate integration of all member NMIs/DIs into the activities of the Technical Committees (enabling their active participation, e.g. piloting intercomparisons, leading a TC or acting as a peer reviewer), research programmes and further joint activities - enabling their active participation in calls within research programmes aimed at developing research capability and grants to support researcher mobility may be listed among the activities that support this objective.

EURAMET will continue to encourage the sharing of metrological expertise between established member institutes and new and emerging members,

EURAMET will also ensure that BoD-WGCB members, EMNs and TCs are informed regularly about their respective work programmes and plans and that regular communication channels are maintained.

EURAMET will take account of capacity building concerns in all areas of its activity and incorporate specific actions into activities and structures that address capacity building issues where it is feasible to do so. Examples of this are the inclusion of CB into the metrology programmes and the designation of contacts for CB issues within many technical committees. This will ensure that capacity building will remain a priority item on EURAMET's agenda and that all EURAMET activities and structures will maintain an inclusive stance towards all member NMIs/DIs.

- **Achieve sustainability of CB activities over the long-term through securing appropriate financial and human resources**

Taking into account the interests of the funders of CB activities, it is a priority for EURAMET to ensure their most efficient and optimal use. It is thus necessary to devote resources to those activities that are seen to deliver the most impact for beneficiaries of these activities, to avoid directing resources at activities that duplicate existing efforts, benefit only very narrow sections of the European metrology community and to periodically take account of the benefits and impact of CB activities to make sure they are aligned with EURAMET priorities.

For EURAMET to maintain and further expand its capacity building efforts, it is crucial to ensure the long-term stability of the resources (human and financial) that sustain them.

In service of this objective, EURAMET shall:

- Maintain commitment to include CB component in all funded programmes and activities, when feasible,
- Seek to cultivate and identify resources for longer-term funding of CB,
- Achieve stability of training infrastructure by building a stable pool of trainers and hosts for training courses.
- Closely monitor the impact of CB activities with the aim of continual improvement of CB tools as well communication of outcomes with stakeholders to generate further support.

- **Cooperate with other organisations on CB matters**

EURAMET shares a concern for capacity building in developing NMIs/DIs with a number of international metrology organisations, chief among them the BIPM. In the interest of making efficient use of resources and building cooperative links in areas of mutual interest, EURAMET will cooperate with these organisations in capacity building activities whenever feasible to do so. An example of such cooperation may be found in the joint training courses within the BIPM CBKT Programme.

In order to support inter-RMO cooperation EURAMET is offering participation possibilities, upon availability, at training courses to students from other RMOs.



## **Annex 1 EURAMET Capacity Building instruments**

### **Training courses and workshops**

Online or events with physical presence in duration of one to five days, addressing wide range of topics: technical subjects, CIPM MRA, Research processes, NMI management & communications, legal metrology.

Input comes from WGCB contact persons, TCs, Liaison Organizations. Annual action plan is proposed at the WGCB annual meeting.

### **RMG – researcher mobility grants**

This instrument supports researchers from a EURAMET NMI/DI to join internal partners in running Research projects for 1 to 18 months, performing research closely related to the project but additional to the project objectives. This is the unique opportunity to build links between NMIs/DIs, work with world leading scientists, produce joint papers and develop their own research skills.

### **Mentoring Scheme Award**

The Mentoring Scheme Award provides a platform for people from two different metrological institutes (NMI or a DI, from a EURAMET member or associate country), in different countries, to set up a partnership and work on a relevant topic, such as technical, managerial, comparisons and traceability.

The award provides funding for travel, accommodation and subsistence to spend between 2 and 6 weeks (not necessarily consecutive) in a different country (from their own).

### **Small collaborative projects (SCPs)**

Support activities (other than research) targeted at emerging EURAMET NMIs/DIs, **clearly focused**, ideally with one specific objective, aiming at:

- supporting **smart-specialisation** through the coordination and sharing of resources and services across national borders,
- building **stronger links with stakeholders** with the aim of determining needs for metrology services and cooperatively developing solutions for meeting them,
- transfer of knowledge to non-NMI/DI actors by building networks with **stakeholders** in metrology services,

### **Research Potential Projects**

For those states with limited metrology research capability, “Research Potential” joint research projects enable them to develop their scientific and technical research capabilities in areas of national and regional strategic priority. The research potential call will build capacity, infrastructure and engage with stakeholders in a coordinated fashion to ensure that services can be delivered at the required local level based on a common knowledge base. It will facilitate access to special support for some NMIs, allowing all to serve their local customers based on the shared facilities and knowledge of them all.

### **E-Learning platform**

A web training platform which embraces various metrology-related training materials developed (and owned) by EURAMET, EURAMET NMI/DIs, BIPM, other RMOs, Research projects and external institutions (e.g. universities) who would grant controlled free access.

It includes existing training material with new ones developed when needed.

This training platform will support CB needs EURAMET as RMO (e.g. with training courses on CIPM MRA operation and operation of TCs); EURAMET members (basic training courses for NMI/DIs staff) and EURAMET Institutional partners and liaison organisations (e.g. other RMOs).



## Annex 2 Summary table with the objectives and activities for their short-and-long term realisation

CB strategic objective	Short term	Long term	Comment
Support building the human and institutional capacity of member NMI and DIs necessary to respond to the demands of indirect stakeholders, both: <ul style="list-style-type: none"> <li>• emerging</li> <li>• all NMIs &amp; DIs: Basic technical skills for the new staff</li> </ul>	<ul style="list-style-type: none"> <li>• HI-CB trainings</li> <li>• Mentoring Scheme Award</li> <li>• Small collaborative projects</li> <li>• E-Learning platform</li> </ul>	Regular offer - long term plan of: <ul style="list-style-type: none"> <li>• technical trainings (e.g. summer schools),</li> <li>• NMI/DI strategic management courses and</li> <li>• communication workshops</li> <li>• pool of hosts – training centres and trainers</li> <li>• Mentoring Scheme Award</li> <li>• Small collaborative projects</li> <li>• E-Learning platform</li> </ul>	<ul style="list-style-type: none"> <li>• Support members in developing a national metrology infrastructure and its promotion among national authorities and stakeholders</li> <li>• Supporting members with specific knowledge for providing services</li> <li>• Support members in aligning their strategy to EURAMET Strategy</li> </ul>
Implement actions for developing or reinforcing member NMIs'/DIs' research capabilities	<ul style="list-style-type: none"> <li>• RPT JRPs RMGs</li> <li>• Linking RPTs to EMNs</li> </ul>	Maintaining of the RPT-like instrument for future	
Support EURAMET NMIs/DIs towards more effective participation in CIPM MRA processes & mechanisms	HI-CB trainings, e.g. <ul style="list-style-type: none"> <li>• for piloting interlaboratory comparisons</li> <li>• possible future TC Chairs</li> <li>• QMS review</li> <li>• Mentoring Scheme Award</li> <li>• E-Learning platform</li> </ul>	Regular offer - long term plan of CIPM-MRA trainings (with BIPM); e.g. <ul style="list-style-type: none"> <li>• TC leadership,</li> <li>• QMS review, (pool of hosts – training centres and trainers)</li> <li>• Mentoring Scheme Award</li> <li>• E-Learning platform</li> </ul>	
Support integration of all EURAMET members into EURAMET structures and activities	HI-CB trainings, e.g. <ul style="list-style-type: none"> <li>• for piloting interlaboratory comparisons</li> <li>• possible future TC Chairs</li> <li>• QMS review</li> <li>• Mentoring Scheme Award</li> <li>• E-Learning platform</li> </ul>	HI-CB trainings, e.g. <ul style="list-style-type: none"> <li>• for piloting interlaboratory comparisons</li> <li>• possible future TC chairs</li> <li>• QMS review</li> <li>• Mentoring Scheme Award</li> <li>• E-Learning platform</li> </ul>	<ul style="list-style-type: none"> <li>• e.g. share the load of piloting interlaboratory comparisons (increase the number of countries piloting ILCs)</li> <li>• leading technical committees, subcommittees</li> <li>• act as experts in peer-reviews</li> </ul>
Achieve sustainability of CB activities over the long-term through securing appropriate financial and human resources	Maintain current staff and financial resources allocated to CB	<ul style="list-style-type: none"> <li>• Staff and financial resources in EURAMET</li> <li>• Stable pool of trainers</li> <li>• Stable pool of hosts / training centre(s)</li> </ul>	
Cooperation with other organisations on CB matters	<ul style="list-style-type: none"> <li>• Joint events with BIPM</li> <li>• E-Learning platform</li> </ul>	<ul style="list-style-type: none"> <li>• Joint events with BIPM, other RMOs (cross-RMO activities where applicable)</li> </ul>	<ul style="list-style-type: none"> <li>• joint events with BIPM and/or other RMOs on technical and CIPM-MRA related topics</li> </ul>