

The gateway to Europe's
integrated metrology community.



EURAMET 2030 Strategy



1. Introduction

This document outlines EURAMET's 2030 strategy.

EURAMET is the Regional Metrology Organisation¹ for Europe, securing world-wide trust and acceptance of European measurements. Metrology, the science of measurement, underpins all domains of science, technology and innovation, and is a key enabler for a modern, healthy society and business.

While EURAMET's core mission remains stable, we are at the same time responding to and fostering new technological and societal challenges. Based on world class science and close cooperation with stakeholders we are further developing a balanced, well integrated European infrastructure where our member institutes can fulfil their ambitions and we all serve customers, policy makers and societies.

EURAMET e.V. was established in 2007 and has 38 member countries, with more than 6000 metrologists in its National Metrology Institutes (NMI) and Designated Institutes (DI). The cooperation goes back several decades earlier. Core tasks are to lead Europe in the CIPM Mutual Recognition Agreement, research and development, and capacity building. [Learn more about EURAMET's history and structure >>](#)

2. Our Changing Context

Metrology for UN Sustainable Development Goals

In 2015, the UN defined the 17 Sustainable Development Goals² to represent humanity's shared vision for a future that is based on both environmental and social sustainability alongside fair economic growth that "leaves no one behind". These far reaching and broad goals cover, e.g., human health, climate and biodiversity change, energy and water supply, feeding a growing global population and creating sustainable cities. Goal 17 on "partnerships" recognises the importance of collaboration between nations, between private and public sectors and between scientific research and policy makers.

As the world's nations work towards these goals there is a strong requirement for reliable global information on the state of the environment, for developing improved medicines and advances in agriculture to ensure the health and wellbeing of the global population. Technological advances in manufacturing, in energy generation, transmission and storage, in communication technologies and in transport infrastructures are urgently required. The digital revolution is driving an increasing demand for real-time data be it in health, environmental monitoring, manufacturing or energy.

For all these areas mentioned above, metrology provides the necessary quality assurance of data and measurements, ensures long-term stability and global equivalence. Such challenges need the support of National Metrology Institutes (NMIs) and the pooling of metrological resources across national boundaries to underpin the global solutions needed. These challenges also require cross-disciplinary and systemic approaches urging the metrology community to build closer relationships with stakeholders and embed metrology in all areas that impact our societies.

¹ <https://www.bipm.org/en/liaison/regional/>

² <https://sdgs.un.org/goals>

Metrology for the European Green Deal

In 2019, the European Commission has launched its strategy on “a European Green Deal”³, to outline its highest-priority objectives for tackling climate and environmental challenges with a long-term goal to be the first climate neutral continent by 2050. The broad initiative aims to boost the efficient use of resources by moving to a clean, circular economy, restore biodiversity and cut pollution. The EU Green Deal will cover all sectors of economy, and numerous challenges demand for innovative solutions where a strong foundation of interdisciplinary metrology support will play a key role, including:

- Environmentally friendly technology
- Innovation in industry
- Transport
- Energy generation, distribution and use
- Buildings
- Raw materials, waste and the circular economy
- Global environmental standards
- Biodiversity and pollution reduction including in forests, fresh water and oceans

Metrology for digital transformation

Furthermore, the European Commission has launched its strategy on “Shaping Europe’s digital future”⁴, which is aligned with the European industry strategy, data strategy and the White Paper on Artificial Intelligence. The key objectives are technology that works for people, a fair and competitive economy, and an open, democratic and sustainable society. According to the vision of the European Commission, this shall be achieved by the digital transformation of existing and established processes and by securing and strengthening European digital leadership.

Digital transformation affects almost all technological areas with manifold implications for metrology. National measurement standards and metrological services must be up-to-date and new metrological solutions are required for complex, digital measurement scenarios, increasingly involving artificial intelligence and machine learning. Metrology solutions are not only needed for measurement equipment coming with a high level of data generation and processing, but also for the quality assessment of the data. Metrology institutes must adapt to these significant changes and can also contribute significantly, as demonstrated through their historical role in securing the high quality and mutual recognition of measurement result data that can be adapted for re-use.

Metrology for healthcare

Diseases and disabilities pose a major socio-economic burden on citizens and health systems worldwide. Infectious diseases including viral epidemics/pandemics, antimicrobial resistant infections as well as non-communicable diseases, including mental disorders and illnesses, represent significant risks and a

³https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en

⁴<https://ec.europa.eu/digital-single-market/en/content/european-digital-strategy>

major challenge. Metrology competence will continue to play a key role in securing reliable and traceable measurements for diagnostics and treatment, for the quality of medical devices, and for developing new innovative methods and equipment for the health sector. The COVID-19 pandemic revealed the importance of having a well performing national quality infrastructure as nations benefited from quality assurance of the test kits based on efficient and effective reference methods and comparisons.

Metrology for multiple demands

Metrology in the member states of EURAMET is at different stages of development and the national requirements vary widely. EURAMET provides the structure where all members develop to fulfil their needs through capacity building and smart specialisation. EURAMET enables its members joining forces to solve challenges that demand for pooling of resources, avoid unnecessary duplication and secure a locally present metrology competence.

Through the establishment of the European Metrology Research Programmes (EMRP⁵ and EMPIR⁶) EURAMET has come a long way in research and development and showcases significant impact on societal challenges and contributions to innovation. Going forward, EURAMET needs to develop into a self-sustaining metrology infrastructure for Europe, based on its backbone of Technical Committees and European Metrology Networks.

Providing traceability of measurement results to the International System of Units, the SI, through national measurement standards, which are primary in many cases, is the core mission of metrology institutes. The outcomes of several projects under EMRP and EMPIR enabled the redefinition of the SI in May 2019. Referencing to fundamental constants rather than the artefacts of the past, the redefined SI allows new routes to superior primary measurement standards being the basis for many solutions to the above-mentioned challenges.

3. Our Vision

Leading the development and application of measurement science enabling Europe to be competitive, healthy and sustainable through innovation

4. Our Mission

Our mission is to:

- **Develop and maintain an appropriate, integrated and cost-effective measurement infrastructure for Europe aligned to the needs of society and industry**

⁵<https://www.euramet.org/research-innovation/emrp/>

⁶<https://www.euramet.org/research-innovation/research-empir/>

- **Ensure that the European measurement infrastructure is internationally competitive and recognised, and is based on world-class R&D.**
- **Support policy and decision makers where metrology is key**
- **Support members in meeting their national requirements through collaboration and a balanced European measurement infrastructure**

5. Strategic Objectives

To deliver our vision and mission, we have identified the following five strategic objectives:

5.1 Engagement of stakeholders

The requirements for investment in the future of the European measurement infrastructure will always far outstrip the resources available from governments to fund it. It is important that EURAMET and European NMIs and DIs understand and prioritise investment needs in the European measurement infrastructure to address the present and future priorities of economy, government and society. EURAMET maintains links with many key users of the measurement infrastructure. It has established several European Metrology Networks (EMN) to strengthen existing and establish new relationships in priority application areas. In addition, a first network focuses on smart specialisation in a specific region – things our members can achieve in cooperation with their close neighbours. Through EMNs EURAMET will foster stakeholder involvement, to better understand existing metrology needs and to anticipate future requirements.

Our key stakeholders include

- Industry and Business
- National Government
- EC
- Standards Organisations
- Universities and research institutions
- Legal and Conformity Assessment Organisations
- The other Partnerships established under Horizon Europe

Key for successful stakeholder engagement is to broaden the understanding of EURAMET's work and the benefits of its achievements for society by effective communication. This will support the increased uptake and impact of metrology research results, and thus secure future support for metrology.

Our Goal is to:

- Foster stakeholder dialogue and develop long-term partnerships
- Understand existing stakeholder needs, identify trends and anticipate future needs
- Increase the impact of our work through take-up by stakeholders

The first EMNs established are

- Climate and Ocean Observation
- Energy Gases
- Smart Electricity Grids
- Traceability in Laboratory Medicine
- Quantum Technologies
- Mathematics and Statistics
- Smart Specialisation in Northern Europe

- Position EURAMET as the indispensable and reliable partner for any enquiry regarding the European measurement infrastructure

In pursuing these goals, we have:

- Established Memoranda of Understanding with sister organisations
- Established several European Metrology Networks
- Established a stakeholder engagement plan

In the next few years, we will:

- Complete the landscape of EMNs and operate them as the primary tool for stakeholder involvement
- Manage actively the engagement with stakeholders, such as European Partnerships under Horizon Europe
- Develop further tools to facilitate knowledge transfer
- Raise the understanding of the benefits of metrology and EURAMET's and its members' contributions to society by customised communication

5.2 Further development of co-operation in Research & Development

EURAMET has worked successfully with the European Commission over the last 15 years to deliver coordination and collaboration in metrology. The previous European Metrology Research Programme (EMRP) and the nearly completed European Metrology Programme for Innovation and Research (EMPIR) have involved twenty-eight European countries and delivered social, economic and scientific impacts⁷.

One example is the redefinition of four of the seven base units⁸ of the International System of Units (SI) in 2019, linking them to fundamental constants, enabled by several joint metrology research projects.

EURAMET is taking it to the next level with the launch of the European Partnership on Metrology. With a thematic scope similar to EMPIR, it will include two new strategic objectives: the establishment of a sustainable, coordinated and integrated European metrology infrastructure and a systematic coverage of metrology needs from regulation. The objectives and challenges described above – the Green Deal with its need for multidisciplinary approaches, digital transformation, the consequences of the SI redefinition – will be strong drivers of the research agenda of the European Partnership on Metrology, including

EMPIR

The European Metrology Programme for Innovation and Research (EMPIR) coordinates research projects to address grand challenges, while supporting and developing the International System of Units (SI), the system of measurement units. EMPIR focuses on innovation activities to target the needs of industry and accelerate the uptake of research outputs. The programme's capacity-building projects aim to bridge the gap between EU member states with emerging measurement systems and those with more developed capabilities. Annual EMPIR research calls between 2014 and 2020 were supported by 300 million Euro of European Union funding.

⁷<https://www.euramet.org/metrology-for-societys-challenges/impact/>

⁸<https://www.euramet.org/metrology-for-societys-challenges/si-redefinition/>

increased collaboration with research institutes, academia, industry and other stakeholders. Such growing collaboration, focussed on these drivers, will also be the basis for additional access to other research funding.

Our Goal is to:

- Continue to deliver world-class fundamental metrology research and develop our core competences underpinning all further applied research, standards and services
- Align the overall metrology research agenda to new challenges associated to the EU Green Deal, digital transformation, regulation, redefined SI units and provide metrology research responding to industrial and societal needs
- Develop integrated, self-sustaining European metrology infrastructures

In pursuing these goals, we have:

- Successfully implemented European Metrology Research Programmes and achieved the desired impact on the European and global stage
- Started to establish European Metrology Networks

In the next few years, we will:

- Strengthen research collaboration through European Metrology Networks
- Implement the European Partnership on Metrology
- Build our capability to access research funding outside the Partnership
- Build joint integrated internationally leading NMI and DI capabilities and infrastructures

5.3 Support for quality infrastructure in Europe and internationally

The quality infrastructure (QI) consists of four pillars: metrology, standardisation, accreditation and conformity assessment. Metrology provides reliable and recognised measurements by assuring traceability to the SI under the mechanisms of the Metre Convention and may be considered as the most fundamental pillar of any national QI system. Due to the relevance of metrology for standardisation, accreditation and conformity assessment, metrology institutes are often active and competent in those areas too and respond to needs from standardisation and regulation through EURAMET's metrology research programmes as well as services, collaboration in committees and policy advice.

The most important mechanism under the Metre Convention is the Mutual Recognition Arrangement, an agreement between NMI Directors defining the conditions under which they recognise calibration results from other NMIs as equivalent to their own. This underpins the technical competence of the signatory NMIs and DIs through comparisons and the efficient review of quality management systems. The work of EURAMET's Technical Committees has a strong focus on the requirements of the arrangement and is a core function of EURAMET.

The digital capability of measurement equipment is continuously evolving. Data generation, processing, transmission and storage becomes more and more digital; complex sensor networks require systemic approaches, and algorithms based on methods of artificial intelligence and machine learning require com-

pletely new methods for quality assurance of measurement results. These developments are not only relevant for metrology, but are key for many regulations and standardisation.

All these challenges and opportunities can only be met and utilised by intense research and development and well-coordinated joint approaches of the metrology institutes. The EMNs are the key drivers for coordination, the interaction with stakeholders and the connection of metrology R&D with regulation and standardisation.

The redefinition of the SI units enabled and requires developments and modifications of national measurement standards, as the primary methods have changed. Some of the new primary methods are adapted to and introduced into commercially available measuring instruments and systems. In these applications the need for standard calibrations, at NMIs and DIs or calibration laboratories, will change and the institutes must adapt.

In view of the global dimension of trade, climate and environmental issues, it is in the interest of Europe that QI systems are functional in all countries around the world. NMIs can contribute through the BIPM⁹ and technical cooperation projects supported by the relevant European, and national funding agencies. An effective international quality infrastructure can enhance fair trade, transparency of decision making, the industrial renewal of Europe and European sovereignty in key supply chains.

Our Goal is to:

- Improve efficiency and effectiveness of the European metrology system aligned to challenges such as the European Green Deal and the changing digital nature of measuring instrumentation, considering the redefinition of the SI and the needs associated with EU regulation through a joint, harmonised underpinning metrology infrastructure
- Contribute to better standardisation and technical rules where the level of national metrology institutes is required or beneficial involving the STAIR platform of CEN-CENELEC and better communication with the European Commission
- Develop a closer cooperation among the NMIs through the work of the EMNs to establish an effective stakeholder interaction and interaction with other European Partnerships
- Support the development of QI systems inside and outside Europe, such as under the umbrella of INetQI¹⁰.

In pursuing these goals, we have:

- Provided major support to the redefinition of the SI through research under EMPIR
- Started to establish European Metrology Networks
- Analysed regulation for which metrology is key
- Assisted WELMEC to become a legal entity

In the next few years, we will:

- Align the European Partnership on Metrology to the above-mentioned challenges
- Provide strategic agendas and strategic research agendas of the EMNs in a harmonised form
- Further develop and implement a joint strategy for digital metrology

⁹<https://www.bipm.org/en/home>

¹⁰<https://www.inetqi.net/>

- Broaden and deepen the cooperation with WELMEC, and other bodies involved in regulation and conformity assessment

5.4 Increased influence with European policy makers and national governments

EURAMET provides support for policymaking where measurement has an important role in setting and/or implementing the policy.

The high-level action plan of the European Commission related to the Green Deal includes proposals such as *"Decarbonising the energy sector"*, *"Rolling out cleaner, cheaper and healthier forms of private and public transport"*, or *"Ensuring buildings are more energy efficient"*, all of which will require regulations where measurement considerations are vital.

However, environment is not the only field where regulations containing metrology elements will be issued. In many areas, metrology contributes significantly to the robust development and implementation of policies. It is crucial to raise awareness with policy makers, such as regulators, standards bodies and legal metrology authorities, about the expertise and the knowledge base of EURAMET and its members.

EURAMET will be proactive and offer advice during the development of European policies. To be more effective in influencing policies, EURAMET will aim to develop an operational mechanism led by the Board of Directors. The member NMIs of EURAMET will work towards a strengthened awareness by their key national ministries, not only their formally assigned ministry. EURAMET will of course not lead those efforts towards the national ministries but will facilitate and support the initiatives of their members. On a European level, the Partnerships under Horizon Europe will be among the key liaison organisations.

As mentioned above, the European Commission has published its strategy „Shaping Europe’s digital future“ in 2020, which is aligned to several related strategies. The key objectives are technology that works for people, a fair and competitive economy, and an open, democratic and sustainable society. EURAMET has a central role in achieving digital transformation of existing and established processes based on the science of measurement and its application.

Our Goal is to:

- Contribute to better regulation
- Be recognised for the contribution that the NMIs, DIs and EURAMET make to enabling a just society
- Gain support and resources for our work
- Provide inputs to the development of relevant policies where measurement considerations are important
- Play a leading role both in the digital transformation of measurement science and in metrology for data

In pursuing these goals, we have:

- Signed collaboration agreements with CEN-CENELEC and WELMEC
- Consciously identified the impact of EMRP, and EMPIR projects in policy issues
- Identified over 70 European regulations where our members support implementation

In the next few years, we will:

- Work towards a new relationship with the European Commission where they recognise the value of the advice and services EURAMET can provide to assist them in developing and implementing regulations
- Screen the priorities of the policy makers for metrological needs and set the priorities of EURAMET accordingly
- Ensure EMNs contribute effectively to the development of European standards of major importance

5.5 High value delivered to members and associates

EURAMET has a diverse membership composed of NMIs and DIs at all levels of development. The national metrology remit of NMIs and DIs is technologically very broad with increasingly complex and demanding needs which cannot be covered by the traditional, nationally fragmented system.

Many European NMIs and DIs represent the cutting edge of global measurement expertise, having a leading role in supporting the global competitiveness of the European economy as well as the development of measurement technologies required by a modern society. Other institutes are in the early development stages, more service-oriented, or are small with very limited resources but still have to keep-up with their stakeholders' needs.

A delicate balance is required between the role of EURAMET in coordinating European measurement and calibration services, and the independence of individual NMIs and DIs to respond to national demands in a sustainable way.

Our goal is to:

- Move to a fit-for-purpose and truly coordinated metrology infrastructure in Europe with appropriate use of joint infrastructures and coordinated services
- Assist members in achieving metrological capability where needed, and to provide reliable cross-border services where not
- Help bridge the gap between emerging and well-developed members, thus developing a balanced and integrated metrology system

In pursuing these goals, we have:

- Supported EURAMET NMIs and DIs towards more efficient and effective participation in CIPM MRA¹¹ processes and mechanisms
- Supported integration of all EURAMET members into EURAMET structures and activities
- Supported building the human and institutional capacity of member NMIs and DIs necessary to respond to the demands of stakeholders, both in emerging fields of metrology and in basic technical skills for new staff
- Implemented actions for developing or reinforcing the research capabilities of member NMIs and DIs
- Allocated staff and financial resources to capacity building activities

¹¹<https://www.bipm.org/en/cipm-mra>

In the next few years, we will:

- Facilitate and accelerate the integration of member NMIs and DIs into EURAMET's activities
- Develop and cooperate in activities related to metrology between EURAMET and international organisations active in metrology, in particular WELMEC
- Share metrological expertise between established member institutes and new and emerging EURAMET members, particularly through Technical Committees
- Develop further capacity building measures for EURAMET members, in particular for emerging and small NMIs and DIs
- Promote the development of a sustainable metrology infrastructure in the countries of new and emerging EURAMET members.
- Foster an improved management and planning in the participating institutes (i.e. strategy development, smart specialisation, sharing of resources at both national and international levels, consolidation of the existing measurement capabilities)

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Further information

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