

BIPM Liaison Report to the ISO CASCO

March 2023

THE VISION, MISSION AND OBJECTIVES OF THE BIPM

The BIPM is the intergovernmental organization established by the Metre Convention, through which Member States act together on matters related to measurement science and measurement standards.

Its **vision** is to be universally recognised as the world focus for the international system of measurement.

Its **mission** is to work with the NMIs of its Member States, the RMOs and strategic partners world-wide and to use its international and impartial status to promote and advance the global comparability of measurements for:

- Scientific discovery and innovation,
- Industrial manufacturing and international trade,
- Improving the quality of life and sustaining the global environment.

THE OBJECTIVES OF THE BIPM

- **To represent the world-wide measurement community**, aiming to maximize its uptake and impact.
- **To be a centre for scientific and technical collaboration between Member States**, providing capabilities for international measurement comparisons on a shared-cost basis.
- **To be the coordinator of the world-wide measurement system**, ensuring it gives comparable and internationally accepted measurement results.

Fulfilling our mission and objectives is underpinned by our work in:

- *capacity building*, which aims to achieve a global balance between the metrology capabilities in Member States;
- *knowledge transfer*, which ensures that our work has the greatest impact.

KEY HIGHLIGHTS

- As of March 2023, the BIPM had [64 Member States](#), and [36 Associates](#).
- The 27th meeting of the CGPM held in November 2022 adopted Resolutions on global digital transformation and the SI, extension of the range of SI prefixes, future redefinition of the second, use and future development of UTC, universal adherence, etc.
- An election was conducted by the CGPM for all 18 seats on the CIPM. The new CIPM will start their term at the next session, which is scheduled for March 2023.
- Based on the "*Joint Statement of Intent on the digital transformation in the international scientific and quality infrastructure*" established last year, the signatories of the statement plan to hold a meeting early 2023 to align the ideas and requirements for a global Digital SI Framework.
- The theme for World Metrology Day 2023 is "*Measurements supporting the global food system*" and the poster will be developed in partnership with INTI (Argentina).
- The decision of the UNESCO Executive Board will need to be ratified by the 42nd session of the UNESCO General Conference in November 2023. If all goes to plan, UNESCO will proclaim 20 May of each year as a UNESCO world day which will then be celebrated every year from 20 May 2024. The proposal was presented by Kazakhstan (prepared by the BIPM and the OIML) and supported by 42 UNESCO Member States.
- The BIPM was admitted by COP27 as an observer to the UNFCCC.
- The BIPM took the lead in project 10. (c) Review for possible updates the *Recommendation K on Metrological Assurance of Conformity Assessment and Testing* of the Programme of work of the Working Party on Regulatory Cooperation and Standardization Policies (WP.6) for 2023.
- BIPM e-learning platform expanded to allow RMOs to publish their training material.
- Knowledge Transfer through *Metrologia* initiative was launched to make review papers openly available to metrology community.
- The BIPM and the OIML, with sponsorship from the METAS (Switzerland), have launched an initiative to develop e-learning and publication material by mid-2023 in support of the *BIPM-OIML publication: National Metrology Systems - Developing the institutional and legislative framework*.

MEMBERSHIP

As of March 2023, the BIPM has 64 Member States, and 36 Associate States and Economies of the CGPM.

The list of Member States and Associates of the CGPM is annexed to this report and is also available at the BIPM website.

Recognizing that a significant number of States still do not participate in BIPM activities and in order to facilitate sustainable and universal adherence to the Metre Convention, the General Conference on Weights and Measures/Conférence Générale des Poids et Mesures (CGPM) adopted Resolution 6 at its 27th meeting inviting the CIPM to examine the membership practices of other international organizations and propose appropriate actions for consideration by the CGPM at its 28th meeting.

THE CGPM

The 27th meeting of the CGPM was held on 15-18 November 2022 at the Palais des Congrès de Versailles. Resolutions adopted by the CGPM on global digital transformation and the SI, extension of the range of SI prefixes, future redefinition of the second, use and future development of UTC, etc. adopted at the meeting webpage is available at: <https://www.bipm.org/en/cgpm-2022>.

THE CIPM

All [decisions](#) of the International Committee for Weights and Measures/Comité International des Poids et Mesures (CIPM) are available on the BIPM webpage at <https://www.bipm.org/en/committees/ci/cipm/outcomes>.

On 18 November 2022, an election was conducted at the 27th meeting of the CGPM for all 18 seats on the CIPM. The new CIPM will start their term at the next session, which is scheduled for March 2023.

Digital transformation/ Towards Interoperable Metrology

The CGPM recognized the importance of the digital transformation for metrology in general and on the SI in particular and adopted at its 27th meeting (2022) a Resolution [“On the global digital transformation and the International System of Units.”](#)

The BIPM develops a digital framework for the International System of Units (SI), allowing the FAIR principles to adopted by the metrology community.

To engage with the stakeholders, several activities were initiated by the BIPM.

First, based on the [Joint Statement of Intent on the digital transformation in the international scientific and quality infrastructure](#) established last year, the signatories were invited to a meeting whose purpose is to align the ideas and requirements for a global Digital SI Framework. The meeting took place in February 2023.

Secondly, a webinar, [“Developments Towards Interoperable Metrology”](#) was organized. It included talks on the BIPM's efforts in the digital transformation of its databases and services as well as on the work initiated in the Consultative Committees, with examples from the Consultative Committee for Time and Frequency and the Consultative Committee for Length.

Whilst the initial focus is on machine-readability of data and services, the final objective is for the data and services to become interoperable and reusable. This will require collaboration with stakeholders as well as developers of unit and quantity systems and vocabularies.

The BIPM continues to pursue several projects in digitalization, aim of which is to become an anchor of trust for the digital transformation in metrology.

- The authoritative document describing the International System of Units (SI) is the [SI Brochure](#). A digital

version of the SI Brochure (9th edition) in XML format is close to completion. In parallel, a prototype of the information contained in the SI Brochure in RDF, interrogatable by SPARQL has been built as a proof of concept.

- An Application Programming Interface (API) for Calibration and Measurement Capabilities (CMCs) as listed in the Key Comparison Database (KCDB) has been implemented in 2021 already [<https://www.bipm.org/en/cipm-mra/kcdb-api>]. Based on this API, the BIPM explores possibilities to demonstrate metrological traceability in the digital area.
- A first prototype of an API for give machine readable access to recommended frequencies for the realization of the meter and the second has been completed.
- For one key comparison (in the field of ionizing radiation) the reporting was of results was digitized. This new approach automates the production of reports on the results from key comparison exercises for publication in the key comparison database, aiming to reduce the time needed to prepare reports without impacting quality.

SCIENTIFIC DEPARTMENTS

A new tool is available from the Time Department, which allows the monitoring of the accuracy of the TAI scale interval with respect to realizations of the SI second by primary and secondary frequency standards (PSFS). The tool was developed with the support of Ms Nelida Diaz, a secondee from CENAM (Mexico). The plot reports the fractional deviation d over the last three years and the different PSFS input data can be inserted or excluded by clicking on the items in the legend.

The plot is automatically updated monthly and is available from the Time Department

database

at https://webtai.bipm.org/database/d_plot.html, reporting the data of Section 3 of Circular T. The monthly Circular T is available at <https://www.bipm.org/en/time-ftp/other-products>.

This tool will help with monitoring the mandatory criteria for the redefinition of the second (See Resolution 5 of the 27th CGPM (2022) "[On the future redefinition of the second](#)").

INTERNATIONAL LIAISON AND COMMUNICATION

The international Liaison and Communication Department of the BIPM oversees the operation of the CIPM Mutual Recognition Arrangement (CIPM MRA), the BIPM publications (including translation service and library), including Metrologia (the BIPM's scientific journal for metrology), BIPM website and Capacity Building and Knowledge Transfer (CBKT) activities.

The Department also manages the World Metrology Day initiative jointly with the OIML.

Department staff also supports States wishing to become Member States or Associates.

Andy Henson, Director of International Liaison and Communication Department retired at the end of February 2023 and Dr Anna Cypionka took over his role on 1 March 2023. She joined the BIPM as Director of International Liaison and Strategic Planning from 1 January 2023.

The BIPM has ongoing institutional and technical interactions with over 30 international organizations and international bodies.

ISO

The BIPM and ISO cooperate to ensure appropriate and consistent use of SI units, and the correct treatment of other metrological aspects, in ISO standards. ISO/IEC 17025 is pivotal to the metrology community, and BIPM collaborates with ISO (and with ILAC and with

the RMOs) regarding this standard. The BIPM has Liaison A status (Organizations that make an effective contribution to the work of the technical committee or subcommittee for questions dealt with by this technical committee or subcommittee) with the ISO Committees in relevant areas where the BIPM is active. Details of the cooperation can be found at:

<https://www.bipm.org/en/liaisonpartners/iso>.

There are following collaborative documents jointly developed by the BIPM and ISO as well as OIML, ILAC and ISO:

1. 2022 Joint Statement of Intent on the digital transformation in the international scientific and quality infrastructure
2. BIPM, OIML, ILAC and ISO: Joint declaration on metrological traceability – originally signed in 2011, updated and reaffirmed in 2018.

OIML – World Metrology Day

Each year on 20 May, the world-wide metrology community celebrates the day the *Metre Convention* was signed in 1875. The project is run jointly by the BIPM and the OIML. The theme for World Metrology Day 2022 was "*Metrology in the Digital Era*". This theme was chosen because digital technology is revolutionizing our community and is one of the most exciting trends in society today. The 2022 poster was designed under the auspices of the COOMET Regional Metrology Organization (RMO). The poster was translated into more than 20 languages and information on more than 30 national celebratory events was provided on the 2022 World Metrology Day Resource Website.

The theme for World Metrology Day 2023 is "*Measurements supporting the global food system*". This theme was chosen because of the increasing challenges of climate change and global distribution of food in a world whose population reached 8 billion at the end of 2022. The 2023 poster was designed by INTI (Argentina) under the auspices of the SIM. The 2023 World Metrology Day Resource Website <https://www.worldmetrologyday.org/> is now live.

UNESCO - World Metrology Day

The UNESCO Executive Board took a key step towards recognizing 20 May - World Metrology Day at their session on 13 October 2022, following the proposal presented by Kazakhstan (prepared by the BIPM and the OIML) and supported by 42 UNESCO Member States. The decision will need to be ratified by the 42nd session of the UNESCO General Conference to be held in November 2023. If all goes to plan, UNESCO will proclaim 20 May of each year as a UNESCO world day which will then be celebrated every year from 20 May 2024.

UNFCCC

On 6 November 2022, the BIPM was admitted by the 27th session of the Conference of the Parties (COP27) held in Sharm-El-Sheikh, Egypt, as an observer organization to the United Nations Framework Convention on Climate Change (UNFCCC). Admission as an observer organization to the UNFCCC is a one-off process, and the BIPM does not need to apply to attend any future sessions or meetings of the UNFCCC. The BIPM will be able to attend and submit statements to future COPs as well as to propose side events and/or exhibitions to represent the world-wide metrology community.

'*Climate Change and Environmental Monitoring*' is identified as one of the priorities in the BIPM Strategic Plan and in the strategic plans of some CIPM Consultative Committees on metrology in chemistry and biology, photometry, and radiometry, etc.

The BIPM operates laboratories that have current and active projects specifically supporting climate monitoring. The BIPM coordinates key comparisons and pilot studies related to greenhouse gases including their isotope ratios and for atmospheric carbon dioxide.

A statement by the BIPM Director has been published under "[Statements by Observer Organizations delivered at the resumed High-Level Segment – 16 November 2022](#)" at COP27.

UNECE

The BIPM took the lead in project 10. (c) *Review for possible updates the Recommendation K on Metrological Assurance of Conformity Assessment and Testing (written in 1998 and last revised in 2008)* of the Programme of work of the Working Party on Regulatory Cooperation and Standardization Policies (WP.6) for 2023.

OECD

In December 2022 the BIPM participated in the OECD-WOAH co-hosted 9th Annual Meeting of International Organisations *"International organizations: Supporting Countries to Anticipate, React and Rebuild in the Face of Global Disruptions"*.

The BIPM has been a focal point of WG2: Inclusiveness (stakeholder engagement and IO coordination) since 2021. It was a cofocal point of WG5: IO Coordination since 2019.

CAPACITY BUILDING AND KNOWLEDGE TRANSFER (CBKT) PROGRAMME AND E-LEARNING

The BIPM Capacity Building and Knowledge Transfer Programme aims to increase the effectiveness with which Member States and Associates engage in the world-wide coordinated metrological system.

To date, there are more than 3000 participations in the various CBKT activities (in-person and online) from more than 124 countries, covering all six RMOs.

In 2022 the e-learning platform

<https://e-learning.bipm.org/> was expanded to enable it also to host the material from the interested RMOs (APMP, COOMET, EURAMET and GULFMET). To date, there are 17 courses submitted by EURAMET, COOMET, GULFMET and the BIPM scientific departments available for metrology community. The e-learning platform is accessible around the clock on any

device to provide learning support to metrologists as conveniently as possible.

The BIPM Physical Metrology Department has developed two CBKT e-learning courses on the kilogram - the fundamental unit of mass in the SI, which was redefined on 20 May 2019. The courses describe how to realize the mass unit and how the kilogram is disseminated following its redefinition.

Metrology for Safe Food and Feed – Mycotoxins knowledge transfer programme has been transferred to online through the e-learning platform, so far there are around 80 participants currently receiving the courses. Those NIMs that are interested in the course, can indicate interests through the registration form available on the e-learning platform.

Metrology for Clean Air knowledge transfer programme, designed to allow NIMs to strengthen their gas standard capabilities, also available through the e-learning platform. NIMs and DIs are able to access the online course material after completing the registration form.

Metrology for Laboratory Medicine - Peptide standards will be launched in 2023.

The call for applications to the sixth cycle of the joint initiative "BIPM-TÜBITAK UME project placements" has been launched and is open until 30 April 2023. The project placement training for the sixth cycle will start in September 2023.

A suite of [brochures](#) has been published under the auspices of the BIPM CBKT programme to provide information and assistance on key roles and mechanisms within the CIPM MRA. The brochures have been written in accessible way for both metrologists and non-experts alike.

"Knowledge Transfer through *Metrologia*" initiative highlights the service rendered to the world-wide metrology community by senior scientists devoting time to publishing review papers on topics of interest and these papers being made openly available to all through Open Access publication in *Metrologia*.

Authors interested in proposing a review paper for open-access publication are invited to contact the Editor of *Metrologia*.

The BIPM and the OIML, with sponsorship from the METAS, National Metrology Institute of Switzerland, have launched an initiative to develop e-learning course and publication material by mid-2023 in support of the BIPM-OIML publication: *National Metrology Systems - Developing the institutional and legislative framework*.

The e-learning courses are available at: <https://e-learning.bipm.org/> and require self-enrolment. Full details of the BIPM CBKT Programme are available at: <https://www.bipm.org/en/committees/cb/cbkt>

THE CIPM MRA

The CIPM MRA is the '*Mutual Recognition Arrangement of National Measurement standards and of calibration and measurement certificates issued by National Metrology Institutes*'. Participation in the CIPM MRA continues to grow: it has been signed by representatives from 64 Member States, 36 Associates of the CGPM, and four international organizations – and covers a further 150 institutes designated by the signatory bodies.

As of March 2023, the [KCDB](#) included a total of 25 807 CMCs. There are 1143 key comparisons and 671 supplementary comparisons registered in the KCDB.

For highlights of the BIPM scientific programme for the period, please refer to the BIPM Annual Review 2021/2022: <https://www.bipm.org/en/publications/annual-review>

ANNEX

64 Member States

(as of March 2023)

Argentina	Korea (Republic of)
Australia	Lithuania
Austria	Malaysia
Belarus	Mexico
Belgium	Montenegro
Brazil	Morocco
Bulgaria	Netherlands
Canada	New Zealand
Chile	Norway
China	Pakistan
Colombia	Poland
Costa Rica	Portugal
Croatia	Romania
Czechia	Russian Federation
Denmark	Saudi Arabia
Ecuador	Serbia
Egypt	Singapore
Estonia	Slovakia
Finland	Slovenia
France	South Africa
Germany	Spain
Greece	Sweden
Hungary	Switzerland
India	Thailand
Indonesia	Tunisia
Iran	Turkey
Iraq	Ukraine
Ireland	United Arab Emirates
Israel	United Kingdom
Italy	United States of America
Japan	Uruguay
Kazakhstan	
Kenya	

36 Associates of the CGPM (States and Economies*)

(as of March 2023)

Albania	Hong Kong (China)*
Azerbaijan	Ghana
Bangladesh	Latvia
Bolivia	Luxembourg
Bosnia and Herzegovina	Malta
Botswana	Mauritius
Cambodia	Moldova
CARICOM*	Mongolia
<i>(11 members:</i>	Namibia
<i>Antigua and Barbuda</i>	North Macedonia
<i>Barbados</i>	Oman
<i>Belize</i>	Panama
<i>Dominica</i>	Paraguay
<i>Grenada</i>	Peru
<i>Guyana</i>	Philippines
<i>Saint Kitts and Nevis</i>	Qatar
<i>Saint Lucia</i>	Sri Lanka
<i>Saint Vincent and the Grenadines</i>	Syrian Arab Republic
<i>Suriname</i>	Tanzania
<i>Trinidad and Tobago)</i>	Uzbekistan
Chinese Taipei*	Viet Nam
Ethiopia	Zambia
Georgia	
Jamaica	
Kuwait	



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