



CCU President's Report

28th CGPM (2026)

A large, decorative graphic composed of numerous concentric, overlapping arcs in a variety of colors including red, orange, yellow, green, blue, and purple. The arcs are arranged in a circular pattern, creating a sense of depth and movement. In the center of this graphic, the following text is displayed:

Working together to
promote and advance
the global comparability
of measurement

www.bipm.org

CCU Executive summary

The CCU is the CIPM's Consultative Committee for Units, responsible for the maintenance, development and improvement of the International System of Units (SI) – the only globally agreed unit system. Over the last four-year period the CCU has been active in several topics related to the development of the SI, especially to improve the SI Brochure – the authoritative document of the SI. The move to digital publishing has made it simpler for updates to the SI Brochure to be made without issuing a new edition. Instead, larger improvements or technical changes result in the production of a new version of the current edition. In the last four years the CCU has published new versions of the 9th edition of the SI Brochure that have incorporated the new SI prefixes approved at the 27th meeting of the CGPM, clarified and improved the treatment of angles and of quantities with the unit one, and reframed the description of non-SI units in the SI Brochure. Concurrently, steps have been taken to improve the accessibility of the SI Brochure and improve its machine readability. These have included: modernizing the Creative Commons license of the SI Brochure, incorporating marginal notes within the main text, and providing a Digital Object Identifier (DOI) for each edition of the SI Brochure. As part of the digitalization agenda the CCU has contributed significantly to the BIPM's SI Digital Framework, and particularly the SI Reference Point, which directly reflects the content of the SI Brochure.

Scope of the CCU

The CCU is responsible for safeguarding the coherence and correct use of the International System of Units (SI), which has the essential role in providing confidence in the accuracy and global comparability of measurements, in particular:

- The development and improvement of the SI, the preparation of successive editions of the SI Brochure and supporting documents and any other summaries relevant for metrology institutes, industry, academia and schools, etc.
- Ensuring the overall consistency of the SI and providing advice to the CIPM about this and measurement units in general.
- Providing information and advice on units, their definition and their use, to a wide range of stakeholders.

To fulfil this task the CCU works closely with its member NMIs and liaison organizations and other stakeholders as appropriate. Operationally, the activities of the CCU are coordinated through its CCU Working Group on Strategy (WG-S). The WG-S ensures that relevant developments in science, particularly in areas not covered by other CCs, are monitored and brought to the CCU's attention; that a long-term vision for the CCU is provided via a strategic planning document; and that an effective linkage between organizations in liaison and in cooperation with the CCU is maintained. The WG-S also provides advice to the CCU on the optimal operational structure of the CCU. Between plenary meetings of the CCU, the work of the CCU is delivered by its Task Groups. These are time-bounded groups, established to complete specific tasks given to them by the CCU.

Strategy

The CCU Strategy document, which was last revised in February 2026, outlines the priorities for the CCU over the next ten years. The main task of the CCU is the improvement and development of the SI. This includes maintaining the SI Brochure via targeted updates and pragmatic editorial improvements that aid understanding without changing meaning. The CCU will also help the digitalization of the SI, supporting the SI Reference Point and wider SI Digital Framework so that authoritative SI content is accessible in a machine-readable form.

A major focus in the coming years will be time and frequency: the CCU will contribute to a possible redefinition of the second from 2030 onwards, providing unit-related input and assessing implications across other fields of metrology. This will include interpretation of the meaning of primary and secondary representations of the second in the context of the two options for redefinition that are currently being considered. Beyond time metrology, the CCU will monitor and provide advice on realizations of important units following the major revision to the SI in 2019. This will include the transition in kilogram dissemination from a consensus value to individual realization; advances in primary thermometry and the possible update or replacement of current temperature scales; progress on quantum-based electrical realization of current; developments in improved SI traceability for isotope ratios and biological quantities; and direct realizations of other SI units made possible by the 2019 revision to the SI. As realizations of units develop, the CCU will also review the *mises en pratique*, or practical

realizations, described in Appendix 2 of the SI Brochure, to ensure they are up to date and consistently presented. The CCU will continue to monitor new developments in science and technology, for instance in quantum technologies, that could challenge the orthodoxy surrounding measurement units and consider their implications for the SI.

Stakeholder engagement also remains central to the strategy of the CCU in order to widen and deepen education about the SI. Relevant stakeholders include the CIPM, NMIs, liaison organizations and the wider scientific, industrial and educational communities, with the BIPM website serving as a key communication mechanism.

Activities and achievements since the last meeting of the CGPM

Main activities and achievements

The CCU has overseen a series of updates to the 9th edition of the SI Brochure since the 27th CGPM. These new versions have taken advantage of digital only publishing, allowing updates to be made without issuing new editions of the SI Brochure. The first of these updates, version 2.01, published in December 2022, implemented the new SI prefixes adopted by the 27th meeting of the CGPM.

To address long-standing questions on angle and the unit one, in 2021 the CCU created the Task Group on Angle and Dimensionless Quantities in the SI Brochure (TG-ADQSIB). This Task Group also established a Focus Group on counting and number quantities (FG-CNQ) to take account of the issues discussed at a workshop on “The metrology of quantities which can be counted” organized jointly by the CCU and CCQM. The Task Group and Focus Group made proposals that were accepted by the CCU at its 26th meeting in April 2024 and approved by the CIPM in June 2024. This led to version 3.01 published in August 2024, providing improvements in the treatment of angles and of quantities with the unit one, providing greater clarity for users, and also strengthening guidance to use explicit units wherever possible. A more minor update, version 3.02 published in August 2025, revised the value of the dalton (responding to the 2022 CODATA recommended values of the fundamental constants), added the new binary prefixes published in IEC 80000-13:2025, and adopted the Creative Commons License CC BY 4.0. Furthermore, each edition of the SI brochure was assigned a DOI and unique webpage, with the webpage for the 9th edition additionally containing a version history.

At the 26th meeting of the CCU in April 2024 it was agreed to address stakeholder feedback about non-SI units in the SI Brochure. Consequently the CCU established a Task Group on Key Topics in the SI Brochure (TG-KTSIB), which considered different structural options for the presentation of non-SI units. The main purpose of presenting commonly used non-SI units in the SI Brochure is to provide authoritative conversion factors to SI units. A final proposal was agreed in October 2025 and subsequently endorsed by the CIPM. These changes were incorporated in version 4.01, published in June 2026. This reconsidered the non-SI units presented in the SI Brochure, expanding this to be closer to the list presented in the 8th edition of the SI Brochure. This section is now titled simply as “non-SI units”, removing for the first time in the SI Brochure’s history the classification “accepted for use with the SI”, the intention and meaning of which had become unclear and less relevant over time. As part of version 4.01, all marginal notes were integrated into the main text, improving machine readability and aligning with the SI’s digitalization ambitions. In addition to non-SI units the TG-KTSIB also reviewed the presentation of SI base and SI derived units in the SI Brochure. This topic had received interest following the revision to the SI in 2019 that, with its explicit emphasis on defining constants, had prompted a discussion about whether the distinction between SI base and SI derived units was necessary or should be described differently. The Task Group decided that the distinction was still useful and that no change to the text of the SI Brochure relating to this topic was required.

The CCU Task Group on Fundamental Concepts in Metrology (TG-FCM) was established at the 26th meeting of the CCU in April 2024. It builds on the previous work on the CCU Task Group on Core Metrological Terms and aims to clarify and formalize the fundamental concepts that underpin metrology. It has attempted to characterize relationships between concepts, using formal mathematical or logical structures where feasible, with the aim of enabling machine readability and supporting future digital metrology tools, and has made steady progress towards a first conceptual framework describing the concept of quantities. The output of the Task Group will support a better understanding of these fundamental concepts, especially in anticipation of

increased digitalization and machine actionable representations of metrological knowledge. The work of the Task Group will also feed into future revisions of the International Vocabulary of Metrology.

Challenges and difficulties

A constant challenge for the CCU is ensuring that the SI continues to evolve in response to advances in technology and the changing requirements of stakeholders. This must be balanced with an appreciation that the SI has developed not only through technological advances but also as a result of cultural and political compromise. It must continue to evolve to meet stakeholder needs whilst recognizing that its most important qualities are stability and consistency. Some issues, such as the status of angle and the unit one within the SI, and the ongoing requirement for a distinction between base and derived units, remain matters of debate. When considering these issues the CCU must ask itself several questions: what is the evidence that there is a problem that needs solving; what is the balance between benefit and disruption from making a change; what problems would be caused by a lack of full adoption of the change; and would any change undermine the SI's status as the only globally agreed unit system? This has provided a useful framework for achieving consensus when deciding on changes to the SI in recent years. A new challenge is posed by digitalization, in particular interpreting the SI Brochure text and associated metrological semantics. Delivering a machine readable and machine actionable SI Reference Point, whilst maintaining the SI Brochure as the authoritative document of the SI will require close and ongoing collaboration between the CCU and the BIPM.

Outlook in the short and long term

The 27th meeting of the CCU is scheduled for April 2027. This meeting will review the progress of the CCU Task Groups since the last meeting and decide on their future objectives. It will also receive updates from Consultative Committees, CIPM Cross-Sectional Forums, Liaison Organizations and any other organizations of relevance to the CCU because of their impact on the realization or definition of units. The meeting will also discuss the future strategy of the CCU.

Following the recent updates to the SI Brochure, no major new versions are foreseen in the near future. Nonetheless the CCU will continue to implement editorial changes that improve the text of the SI Brochure without affecting its meaning. It is envisaged that the 10th edition of the SI Brochure will be prepared in time to coincide with the future redefinition of the second. This would involve a more thorough review of the entire text of the SI Brochure and would most likely be the subject of a future CCU Task Group.

CCU Data

CCU set up in 1964 (replacing the Commission for the System of Units, set up in 1954)

President: R.J.C Brown

Executive secretary: M. Stock

Membership:

Thirteen members, eleven liaisons, no observers

List of CCU members:

<https://www.bipm.org/en/committees/cc/ccu/members>

Meetings since the 26th CGPM meeting:

9 – 11 April 2024

Full reports of the CCU meetings:

<https://www.bipm.org/en/committees/cc/ccu/publications>

One Working Group:

<https://www.bipm.org/en/committees/cc/ccu>

– Strategy (WG-S)

Two Task Groups:

- Fundamental Concepts in Metrology (TG-FCM)
- Key Topics in the SI Brochure (TG-KTSIB)