



Consultative Committee for Amount of Substance: Metrology in Chemistry and Biology (CCQM)

Report of the 31st meeting

(16-17 April 2026)

to the International Committee for Weights and Measures



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LIST OF MEMBERS OF THE CONSULTATIVE COMMITTEE FOR AMOUNT OF SUBSTANCE: METROLOGY IN CHEMISTRY AND BIOLOGY

as of 16 April 2026

President

Dr S.-R. Park, member of the International Committee for Weights and Measures also Korea Research Institute of Standards and Science [KRISS], Daejeon.

Executive Secretary

Dr R. Wielgosz, International Bureau of Weights and Measures [BIPM], Sèvres.

Members

Centro Nacional de Metrología [CENAM], Querétaro.

D.I. Mendeleyev Institute for Metrology, Rosstandart [VNIIM], St Petersburg.

Danish Fundamental Metrology A/S [DFM], Hørsholm.

Federal Institute for Materials Research and Testing/Bundesanstalt für Materialforschung und –prüfung [BAM] Berlin.

Federal Institute of Metrology METAS [METAS], Bern-Wabern.

Health Sciences Authority [HSA], Singapore.

Instituto Nacional de Metrologia, Qualidade e Tecnologia [INMETRO], Rio de Janeiro.

Instituto Português da Qualidade [IPQ], Caparica.

Korea Research Institute of Standards and Science [KRISS], Daejeon.

LGC Ltd [LGC], Teddington.

Laboratoire National de Métrologie et d'Essais [LNE], Paris.

National Institute of Metrological Research/Istituto Nazionale di Ricerca Metrologica [INRIM], Turin.

National Institute of Metrology [NIM], Beijing.

National Institute of Metrology (Thailand) [NIMT], Pathumthani

National Institute of Standards and Technology [NIST], Gaithersburg.

National Measurement Institute, Australia [NMIA], Lindfield.

National Metrology Institute of Japan, AIST [NMIJ/AIST], Tsukuba.

National Metrology Institute of South Africa [NMISA], Pretoria.

National Metrology Institute of Turkey /TÜBİTAK Ulusal Metroloji Enstitüsü [UME], Gebze-Kocaeli.

National Physical Laboratory [NPL], Teddington.

National Research Council of Canada [NRC], Ottawa.

Physikalisch-Technische Bundesanstalt [PTB], Braunschweig.
RISE Research Institute of Sweden AB [RISE], Borås.
Slovak Institute of Metrology/Slovenský Metrologický Ústav [SMU], Bratislava.
VSL Dutch Metrology Institute [VSL], Delft.
The Director of the International Bureau of Weights and Measures [BIPM], Sèvres.

Observers

All-Russian Scientific Research Institute of Physical Technical Measurements, Rosstandart [VNIIFTRI], Moscow.
Bulgarian Institute of Metrology [BIM], Sofia.
Central Office of Measures [GUM], Warsaw.
Centro Español de Metrología [CEM], Madrid.
CSIR National Physical Laboratory of India [NPLI], New Delhi.
Government Laboratory [GL], Kowloon.
Government Office of the Capital City Budapest [BFKH], Budapest.
Instituto Nacional de Tecnología Industrial [INTI], San Martín, Prov. Buenos Aires.
Kenya Bureau of Standards [KEBS], Nairobi.
National Metrology Centre, Agency for Science, Technology and Research [NMC, A*STAR], Singapore.
National Physical Laboratory of Israel [INPL], Jerusalem.
State Enterprise "All-Ukrainian State Scientific and Production Center of Standardization, Metrology, Certification and Consumer' Rights Protection" [SE "Ukrmetrteststandard"], Kyiv.

Liaisons

Cooperation on International Traceability in Analytical Chemistry [CITAC].
European Commission – Joint Research Centre [JRC-Geel].
International Atomic Energy Agency [IAEA].
International Federation of Clinical Chemistry and Laboratory Medicine [IFCC].
International Organization for Standardization, Committee on Reference Materials [ISO REMCO].
International Union of Pure and Applied Chemistry [IUPAC].

1. OPENING OF THE MEETING

The Consultative Committee for Amount of Substance: Metrology in Chemistry and Biology held its 31st meeting at the International Bureau of Weights and Measures (BIPM) headquarters, at Sèvres, and on-line, on 16 and 17 April 2026.

The following attended:

Members

H. Andres (METAS), K. Arrhenius (RISE), Y.-K. Bae (KRISS), L. Balottin (INMETRO), K. Beers (NIST), M. Bilsel (UME), A. Botha (NMISA/ISO-REMCO), J. Braybrook (LGC), P. Brewer (NPL), R.J.C. Brown (NPL), J. Carney (NIST), V. Delatour (LNE), F. Dewi (HSA), F. Dias (IPQ), C. Divieto (INRIM), L. Dong (NIM), J. Dumanska (GUM), S. Ellison (LGC/IUPAC), C. Engelhard (BAM), M. Fernandes-Whaley (NMISA), P. Fiscaro (LNE), H. Goenaga Infante (LGC), N. González Rojano (CENAM), P. Grinberg (NRC), J.A. Guardado Pérez (CENAM), S.W. Heo (KRISS), K. Inagaki (NMIJ/AIST), N. Itoh (NMIJ/AIST), A. Koo (Director of the BIPM), Y.A. Kustikov (VNIIM), K.-S. Lee (KRISS), L. Liv (UME), D. Markus (PTB), J. Melanson (NRC), Z. Mester (NRC/CITAC), S.Y. Ng (HSA), J. Noireaux (LNE), G. O'Connor (PTB), T.A. Ortega Alcantara (CENAM), C. Palma (IH-LQPM), S.R. Park (President of the CCQM/CIPM/KRISS), C. Pascale (METAS), E.C. Pires do Rego (INMETRO), R. Quendera (IPQ), T. Ren (NIM), C. Rimmer (NIST), J.M. Rodrigues Caixeiro (INMETRO), A.M. Rossi (INRIM), E. Sahlin (RISE), M. Segal (INRIM), K. Segelcke (DFM), K. Shearman (NIMT), D. Smeulders (NMIA), E. Sobina (VNIIM), V. Špáníková (SMU), R. Stosch (PTB), S. Taebunpakul (NIMPT), T. Tarhan (UME), T.L. Teo (HSA), M. Valkova (SMU), A. van der Veen (VSL), M. Vonsky (VNIIM), D. Wang (NIM), D. Worton (NPL), E. Yildirim (RISE).

Observers

S. Aggarwal (NPLI), Y. Cui (NMC, A*STAR), V. Dobrovolskiy (VNIIFTRI), T. Fernández Vicente (CEM), F.M. Kai (NMC, A*STAR), B. Koleva (BIM), P.K.J. Lau (GL), O. Levbarg (SE "Ukrmetrteststandard"), D. Nagy (BFKH), C.-S. Ng (GL), N. Oganyan (VNIIFTRI), A. Petrenko (SE "Ukrmetrteststandard"), M.M. Puellas (INTI), A. Rojo Esteban (CEM), H.K. Rotich (KEBS), L.N. Santos (INTI), S.P. Singh (NPLI), V.N. Singh (NPLI), M. Strzelec (GUM).

Liaisons

F. Camin (IAEA), C.M. Cobbaert (IFCC), R. Koeber (JRC-Geel).

Representatives of Institutes from Member States invited to attend as

Observers

J.E. Leguizamón Guerrero (INM Colombia), Dr G. Molina-Castro (LACOMET).

Guests

A.R. Al Askar (SASO-NMCC), E. Alasonati (LNE), B. Calderón Jiménez (LACOMET), M. Cleveland (NIST), B. Fu (NIM), W.-H. Fung (GL), C. Gonzalez (NIST), J. Huggett (LGC), Å. Jämting (NMIA), S. Lee (KRISS), S. Lin-Gibson (NIST), J. Meija (NRC), T. Näykki (MIKES-SYKE), M. Panteghini (JCTLM), S. Seitz (PTB), A. Shard (NPL), C. Swart (PTB), L.-L. Tay (NRC), M. Winchester (NIST), L. Wu (NIM).

Also present

G. Martos (BIPM), C. Robertson (BIPM), R. Wielgosz (BIPM, Executive Secretary of the CCQM).

2. Appointment of a Rapporteur and approval of the agenda

Dr Park asked Dr Cleveland to serve as Rapporteur. The meeting confirmed the appointment of Dr Cleveland as rapporteur. Dr Park presented the proposed agenda ([CCQM/2026-01](#)), which was adopted without change.

3. Opening remarks of the CCQM President and actions from the 30th meeting of the CCQM

3.1. Opening Remarks

Dr Park noted that the working meetings preceding the plenary had gone very smoothly thanks to the excellent work of the BIPM staff. Additionally, there was only one group meeting on a weekend day, which was a significant improvement over last year.

3.2. Review of Actions

Dr Wielgosz reviewed the actions from the 30th meeting of the CCQM. The list of actions agreed at the meeting was appended to the Report of the 30th meeting of the CCQM. All actions were complete.

4. Opening remarks from the BIPM Director

[[CCQM/2026-36](#)] Dr Koo gave an update on BIPM activities. She noted that Uzbekistan had recently become a full Member State. As of the April 2026 meeting, there were 26 403 CMCs. In October, Member States will come together at the 28th meeting of the CGPM, which occurs once every four years. There are currently seven draft resolutions for the CGPM. Three of the resolutions are related to time metrology: the redefinition of the second, technical actions need to ensure the continuity of UTC, and BIPM's role on the definition of an international lunar reference time scale and its traceability to UTC. The fourth draft resolution focuses on the cross-cutting issue of digital transformation. The remaining resolutions relate to organizational issues: universal adherence to the Metre Convention (introducing observer status), rules of procedure of the CGPM, and dotation of the BIPM for the years 2028-2031. The BIPM Work Programme for 2028-2031 has been developed and is available to the NMI community for feedback until 8 May 2026. She noted Dr Wielgosz would give further details on the chemistry programme later in the meeting. There is a plan for an increase in joint technical projects, especially Secondées from NMIs which builds the services of BIPM and ensures harmonization around the world.

She reviewed the decision of CIPM regarding *Metrologia*, which has become open access and no longer publishes comparison reports. Comparison reports are now published directly on the BIPM website, in a very similar format with an assigned DOI.

The International Vocabulary of Metrology (VIM) – Fourth Edition is ready to be fully approved. This new edition is focused on introducing new entries pertaining to nominal properties. There was considerable discussion regarding a new definition for uncertainty, but ultimately it was decided that the long-standing definition of uncertainty should be retained for this edition. BIPM is soliciting comments from all NMIs to inform their vote – BIPM is only seeking editorial comments and major objections as technical comments will be covered in future editions. Members with comments about the new VIM should respond via their NMIs

by 21 August 2026. BIPM also renewed the MoU with UNESCO in December 2025; this updates the previous agreement from 1949. Finally, she noted that the theme of World Metrology Day 2026 is “Metrology: Building Trust in Policy Making”. BIPM will be hosting an online event in collaboration with UNESCO on policy making and AI.

5. Reports from CCQM Task Groups including outcomes of workshops

5.1. CCQM Task Group on Data Digitalization (CCQM-TG-DD): Progress report

[[CCQM/2026-08](#)] [[CCQM/2026-37](#)] Dr Gonzalez presented. He noted that he had received a large amount of support from BIPM staff in establishing the TG. Dr Gonzalez reviewed the resolution from the 27th meeting of the General Conference in 2022, which led to the creation of the FORUM-MD. In September 2024, CCQM organized a workshop on Digital and FAIR Chemical and Biological Reference Data and Certificates. The main themes were unique interoperable identifiers, digitalization of CRM certificates, and FAIR principles in database development. The workshop had several recommendations, one of which was the creation of the CCQM-TG-DD.

Dr Gonzalez explained the organization of the TG and described the scope of each of the three teams. Each team has a chair, rapporteur, experienced users and developers. Team 1 focuses on unique identifiers for chemical and biological data, Team 2 focuses on digitalization of CRM certificates, and Team 3 focuses on FAIR principles in chemical and biological databases and artificial intelligence.

Dr Swart noted that PAWG has a case study for a machine-readable report.

Dr Gonzalez asked people to report any issues found related to data digitalization, so that the TG can address them. Dr Wielgosz asked how much structure is required in the report format to allow large language models (LLMs) to extract data from the reports. Dr Gonzalez replied that the models are very flexible with regards to format but that they need to be trained. Currently, the most important limitation is the ability of the models to read text with the current optical character recognition (OCR) technology.

Dr Winchester noted that NIST took three decades of reports, in a variety of formats, and asked the LLM to extract the information, which was not perfect but worked very well with limited training. Dr Wielgosz stated that it was important to know how much structure is needed because this would be important in deciding how much resources should be used in achieving similarity or a unique format for reports.

Dr Fernandes-Whaley noted that OAWG was enthusiastic about the results from the test case and the possibility of expanding that. Dr Gonzalez noted there were some issues extracting data from the KCDB with APIs, as they had achieved different numbers from different models. Dr Botha stated that the KCWG is already under a lot of pressure and there are insufficient resources to maintain the review of CMCs as currently done, and she asked when this project would be ready. Dr Gonzalez replied that they are currently prioritizing and talking with the WG chairs.

Dr Wielgosz noted that the JCTLM database is currently being upgraded, and the

new web platform should be ready by the end of the year. Additionally, a new system for CMC categories for the KCDB should be ready in two years.

5.2. CCQM Nano and Microplastics Measurements and Standards Task Group (CCQM-TG-NMMS): Final report and recommendations for CCQM studies

[[CCQM/2026-27](#)] [[CCQM/2026-31](#)] Dr Jamting presented. She reviewed the timeline of the TG's formation, which included two workshops. The TG surveyed NMIs about their capabilities in microplastic and nanoplastic measurements and asked what CCQM activities could help to advance global comparability for these measurements. The survey indicated strong interest in further workshops. A second workshop was held in 2024, allowing the TG to compare participant feedback between 2022 and 2024. The feedback highlighted ongoing measurement challenges, underscoring the need for a robust measurement infrastructure. The TG gathered information on beneficial interlaboratory studies, identifying particle size as the most desired measurand. Dr Jamting proposed an initial pilot study on nano- and microplastics, representing a step towards establishing a coherent metrological framework for nano- and microplastics analysis. Proposed measurands included particle size distribution, particle number concentration, and particle mass fraction/concentration. The samples would be derived from aged polyethylene terephthalate (PET). Two such materials are currently in preparation by JRC. One material has a particle size of less than 1 μm , while the second material has a particle size between 1 μm to 5 μm . The samples are planned to have a mass concentration of greater than 10 $\mu\text{g/mL}$ and a number concentration of greater than 10^5 particles/mL. The proposed CCQM study would be conducted using the same materials as the related VAMAS interlaboratory comparison. While the VAMAS study supports the development of harmonized measurement practices, the CCQM study would contribute additional metrological rigour regarding uncertainty evaluation and comparability among institutes. Dr Jamting suggested that the pilot study could be run directly by the TG, rather than a Working Group (WG), to leverage the diverse expertise within the TG. She concluded by asking the CCQM to approve the proposed pilot study, determine its governance, and extend the term of the CCQM-TG-NMMS.

Dr Goenaga Infante noted that the TG had successfully bridged several metrological gaps and defined the measurands in direct response to stakeholder needs. Dr Beers enquired about the choice of aged PET. Dr Jamting responded that while extensive work had already been done on pristine plastics—which provide clean, homogeneous samples that are relatively easy to identify—the TG now sought to evaluate a more complex, realistic sample. Dr Wielgosz stated that the TG had met its terms of reference, but the organization and governance of the study remained to be decided. He advised that it is not standard practice in CCQM for a comparison to report directly to the CCQM and suggested it should be hosted under a WG. He noted that this had been previously discussed, with SAWG suggested as a possible home for the study. Dr Winchester noted that allocating less than two months for measurements would likely be insufficient, unless dictated by material stability concerns.

Dr Swart expressed reservations regarding the decision of the CCQM to only allow studies to be run by WGs, and asked for further explanation. Dr Wielgosz clarified that operational issues, including review of the comparison protocol and detailed independent review of results, are best discussed under the supervision of a CCQM WG, and this is the organizational structure used within the CCQM. This discussion was continued in Section 9.3.

5.3. CCQM Task Group on Gene Delivery Systems (CCQM-TG-GDS): Progress Report

[[CCQM/2026-38](#)] Dr Braybrook presented. He reviewed the terms of reference for the task group and outlined current measurement challenges in this area. The TG's goal is to prioritize measurement needs and gaps for reference measurement methods and reference materials for quantifying gene delivery systems, considering existing international standards. The TG has identified metrology needs for viral vectors, specifically regarding count, composition, and function/activity. The TG is currently being co-chaired by Dr Braybrook and Dr Lin-Gibson. There are representatives from the NAWG, PAWG, CAWG, IAWG and SAWG. A study planned to be run by CAWG has been outlined and a small discussion group is planned from May 2026 to September 2026 to agree the pilot study proposal, which will be presented in the next year.

5.4. CCQM Task group on Comparison Material Transportation (CCQM-TG-CMT): Report

[[CCQM/2026-39](#)] Dr Swart presented. This TG was established in response to recurring issues during the delivery of study materials, aiming to document experiences and best practices. The overall recommendations of the TG included ensuring very thorough documentation and actively monitoring shipments. Furthermore, recipient NMIs should be prepared to handle customs clearance quickly. The TG also suggested providing a "Non-Dangerous Goods" declaration written in the local language, checking for public holidays in the recipient countries before shipping time-sensitive samples, and ensuring that pilot laboratories verify courier agreements for transporting dry ice while having alternative options on standby. Dr Braybrook recommended that the task group contacts ISO/TC 334 to seek their advice. Dr Wielgosz asked if Dr Swart would like the task group to continue; Dr Swart replied that while the group had clearly identified the issues with shipments, finding solutions would take a great deal longer. Dr van der Veen noted that the GAWG currently had cylinders stuck in customs; additionally, the GAWG has had participants inadvertently discard important paperwork, such as the original documentation of the gas cylinder. Dr Park agreed to look into facilitating discussions between the BIPM and the World Customs Organization (WCO), to see if the Harmonized System (HS) code can be expanded to include study materials in addition to CRMs, or if an additional code can be created. He recommended closing the task group, coupled with a recommendation for the BIPM to contact the WCO. The CCQM approved the closure of the CCQM-TG-CMT.

5.5. CCQM Task Group on Metrology for Li-ion Batteries (CCQM-TG-LI-ION): Progress Report

[[CCQM/2026-05](#)] [[CCQM/2026-40](#)] Dr Seitz presented. He reviewed the formation of the TG and its activities. This TG was created to identify and evaluate measurands and metrological services related to Li-ion battery technology. The TG has 14 members and has met 12 times from 2023 to 2025. The TG collaborated with VAMAS, which has a project to define measurable key parameters for lithium-ion cell standardization and conduct comparison measurements to quantify reproducibility.

Recently, the TG held a two-day workshop on “International Comparability of Alkali-Metal Ion Battery Measurements”, which had approximately 50 participants. Topics covered at the workshop included impedance standards, state of charge, state of health, reference measurements, IEC TC 113, water content, in-operando characterization, material characterization, and recycling. The main conclusion of the workshop was that battery measurements are often proprietary and there is a lack of harmonized definitions and procedures. Dr Seitz noted that these issues must be resolved before measurement harmonization can be achieved. He suggested that the CCQM close the CCQM-TG-LI-ION, which was agreed.

5.6. CCQM Task Group on Infectious Disease Diagnostics and Metrology for Pandemic Preparedness (CCQM-TG-PANDEMIC): Progress Report

[[CCQM/2026-41](#)] Dr Braybrook presented. This TG was established to guide the implementation of the roadmap for metrology's role in preparing for and responding to infectious disease pandemics, with an initial term of operation from October 2022 to April 2025, which was subsequently extended to April 2026. He noted that the TG had made a positive impact on activities at INM Colombia, which has created its own roadmap. The TG has two subgroups; subgroup 1 was focused on “fire drill” comparison exercises to test metrology readiness, while subgroup 2 was tasked with creating an eLearning course on metrology for pandemic response. Two fire drill studies were completed, one in NAWG and one in PAWG. The eLearning module has also been completed and is now available on the BIPM eLearning platform. Dr Braybrook stated that the TG could now be closed, as it had achieved its objectives, or the terms of reference could be revised to give the TG new objectives. The CCQM decided to close the TG, and Dr Braybrook will propose terms of reference for a new TG for consideration by the CCQM.

5.7. CCQM Task Group on Food Measurement (CCQM-TG-Food): Progress Report

[[CCQM/2026-70](#)] Dr Melanson presented. He outlined the TG's primary objective to develop a comprehensive strategy and work programme report spanning 2021 to 2030. The TG is tasked with identifying food-related metrology gaps, finding unmet stakeholder engagement opportunities, and facilitating collaboration. To achieve this, they have engaged with representatives across all CCQM working groups, as well as the CCT (humidity), CCPR (spectroscopic measurements), CCM (density and pressure), and CCRI (sterilization). These efforts were supported by an internal workshop in 2024 and a larger four-day stakeholder workshop in February 2025.

Currently, the TG is focused on finalizing the strategy report, which includes sections on specialized methods to support international trade, as well as conventional and emerging contaminants. Dr Melanson noted that the main challenge in drafting is finding a cohesive voice that balances the highly granular data of established groups with the broader, forward-looking components. The team is aiming to complete the draft by June 2026 to allow for a consultation period, ensuring it is completely finalized by August 2026 so it can be highlighted as a poster at the CGPM in the autumn.

6. CCQM Workshops and Sector Engagement

6.1. Report from the JCTLM

[[CCQM/2026-69](#)] Prof. Panteghini presented. He reviewed the committee's structure and noted that the JCTLM database currently covers 60-70 % of laboratory analyses by frequency. He reminded CCQM members of the annual review process timeline, emphasizing that the JCTLM Executive will strictly enforce the 31 May deadline for nominations, because processing late submissions is no longer sustainable. To streamline processes, the JCTLM is developing a new web platform planned for launch in 2027, and the TG on Knowledge Transfer has released eLearning modules detailing the submission process. Prof. Panteghini highlighted key policy requirements: nominators must now provide evidence demonstrating the extent of equivalence between listed and newly nominated references for the same measurand. Furthermore, CRMs intended as common calibrators must include commutability information to prevent the introduction of bias in clinical sample results. Prof. Panteghini noted several areas where JCTLM activities align with the CCQM 2030+ strategy document. To address high-priority measurands currently lacking CRMs, such as serum ALT, AST, and total bilirubin, the JCTLM will host a workshop on 27-28 May 2026 in Bydgoszcz, Poland, focused on filling these reference material gaps. Additionally, the JCTLM Task Force on Reference Measurement System Implementation is analysing the performance of listed reference measurement service providers in the RELA EQAS to identify and address any potentially significant biases. Finally, to support database maintenance, database development, and JCTLM secretariat operating costs, a new tiered membership model is proposed for 1 January 2027. Full Members will pay annual subscriptions and receive reductions in biennial meeting registration fees, while Associate Members will not pay subscription but receive no reductions in registration fees; a recent survey indicated that majority of respondents remain open to this new model.

6.2. CCQM Workshop on Metrology for (Multi)-omics Measurements in Clinical Diagnostics: Outcomes

[[CCQM/2026-42](#)] Dr Swart presented. In March 2026, the CCQM held a workshop titled "Metrology for (multi)-omics measurements in clinical diagnostics". The

primary goal was to provide an overview of current and emerging clinical applications across genomics, proteomics, and metabolomics, while identifying critical challenges in achieving comparability and traceability. A major theme was the variability and challenges regarding the reproducibility of measurement results. Contributors noted that these variations often stem from biological variation, differing matrices, and inconsistent sample handling and preparation protocols. Furthermore, a participant survey confirmed that the lack of standardized reference measurement procedures and the scarcity of available, commutable reference materials remain the most significant barriers to transferring 'omics' approaches into routine clinical diagnostics.

To address these hurdles, participants proposed several metrological solutions, including the implementation of standardized workflows spanning from sample collection to data analysis. There is an urgent need for reference materials and quality control materials for every analytical step, with a specific call for isotopically enriched materials to serve as internal standards. In fields like metabolomics, where CRMs can take up to ten years to produce, alternative approaches such as using beacon molecules as calibrators were discussed. As a next step, the organizing team plans to publish a white paper detailing the current state-of-the-art, identified gaps, short-term solutions, and a potential metrological framework. The workshop concluded by emphasizing the need for increased cooperation between NMIs and international societies, as these metrological challenges are too demanding for single institutes or countries to solve alone.

6.3. CCQM workshop on re-review of CMCs and other supporting evidence

[[CCQM/2026-43](#)] Dr Botha presented. She stated that the workshop addressed the growing challenge of maintaining and re-reviewing the expanding number of chemistry and biology CMCs, with a current backlog of nearly 1 500 CMCs approved in or before 2015. To manage this workload sustainably, the workshop recommended returning the primary responsibility for CMC maintenance to the NMIs and DIs, with the KCWG shifting to an oversight role. She outlined how various working groups presented strategies to optimize measurement space coverage; for example, IAWG utilises a core capability strategy and a record of participation, while GAWG routinely archives older comparisons and implements a flexible scheme to prompt timely CMC updates from participating laboratories.

Dr Botha also clarified the core requirements for utilizing other evidence, such as pilot studies, bilateral comparisons, or peer-reviewed publications, to support CMC claims. She emphasized that any alternative evidence must clearly establish metrological traceability, estimate measurement uncertainty, and demonstrate comparability of measurement results. Furthermore, Dr Botha highlighted significant structural deficiencies in the current CMC service categories, particularly the lack of dedicated classifications for evolving biological fields. To resolve this, she proposed a short-term addition of new sub-categories and a long-term goal of completely updating the system, potentially adopting a metadata tagging approach to improve digitalization. Finally, to alleviate the administrative review burden, she proposed utilizing automated tools to screen CMCs for routine errors, noting that this task has been formally transferred to CCQM-DD-TG Task Team 3.

During the subsequent discussion, Dr Brewer noted the importance of relying on current objective evidence rather than historical standing, as institutional capabilities can evolve over time. Dr Botha agreed, clarifying that while comparisons remain the cornerstone of CMC support, the community must maximize the coverage of each comparison to support broader measurement spaces where individual comparisons for every service are impractical. Dr Park suggested that on-site peer reviews could help verify capabilities; however, Dr Botha noted that these reviews often lack the necessary technical depth for CMC evaluation unless clear technical guidelines are established. Dr Winchester supported the need for practicality, highlighting that demanding exhaustive evidence for every claim is not feasible. Emphasizing the perspective of accreditation bodies, Dr van der Veen stressed that documented participation in comparisons is vital to prevent institutes from needing to withdraw accredited services. Dr Mester appreciated the guidance on contextual evidence to balance strict assessments with global client demands and enquired if evolving these approaches might impact the ILAC MRA. Dr Botha reassured the committee that the rigour of CMC reviews is actually increasing to address older claims, and the integrity of the ILAC MRA will be fully maintained.

6.4. Report from the IFCC

[[CCQM/2026-44](#)] Dr Cobbaert presented. She noted that there are strategic challenges and opportunities arising from the large number of new European Union regulations affecting laboratory medicine, including the *In Vitro* Diagnostic Regulation (IVDR), the European Health Data Space (EHDS), and the AI Act. She highlighted the ongoing IVDR reform, which proposes essential flexibility and simplification for both commercial and in-house laboratory tests, to support public health needs and emergency preparedness. With regard to the EHDS, Dr Cobbaert cautioned that while the regulation aims to create a common framework for accessing and sharing health data across the EU, policymakers often assume data is easily exchangeable and overlook the critical role of metrology and standardized metadata necessary for true interoperability. Furthermore, as artificial intelligence increasingly enters fully automated medical laboratories for diagnostic support, she emphasized that there is no reliable AI without high-quality data. She highlighted the urgent need for "digital metrology" to capture sufficient molecular detail to safely facilitate the rapidly growing precision medicine market.

During the subsequent discussion, Dr Park asked what the CCQM could do to address the disconnect between metrologists and policymakers. Dr Cobbaert pointed out that metrology is frequently absent from policy-making discussions, noting that clinical and diagnostic societies must form larger consortia to effectively advocate for patient-centric regulations. Dr Wielgosz noted that the theme of World Metrology Day this year is "Metrology: Building Trust in Policy Making" and suggested leveraging this to formally highlight areas where measurement science has considerable impact in healthcare policy. Dr Cobbaert acknowledged that the laboratory medicine community cannot tackle these significant regulatory shifts alone and reiterated the importance of joint curricula and unified global advocacy efforts to ensure that future healthcare policies are grounded in sound metrological principles.

7. CCQM Strategy

7.1. Comments and final version of the CCQM 2021-2030+ strategy

[[CCQM/2026-16](#)] [[CCQM/2026-17](#)] [[CCQM/2026-45](#)] Dr Wielgosz presented.

He provided an update on the progress of the CCQM Strategy document, aiming to extend its horizon from 2030 to 2034. He noted that six working groups—CAWG, EAWG, GAWG, OAWG, SAWG, PAWG—updated their specific strategies early in 2025, with NAWG publishing theirs slightly later in September. IAWG and IRWG chose to maintain their existing strategies, while the KCWG's strategy remains under continuous review. Dr Wielgosz detailed the collaborative drafting process, which included two CCQM-SPWG meetings and the circulation of Version 2.4 for CCQM Member comment in December 2025.

Dr Wielgosz highlighted that while there were no major overhauls, the updated strategy explicitly incorporates the recent proliferation of CCQM TGs and maps their activities against the CIPM 2030+ strategic priorities. The revised document also places a stronger emphasis on bio-measurements, specifically the development of reference materials and methods to standardize 'omics' approaches. Furthermore, it includes a comprehensive report on the achievements related to the CCQM's previous strategic objectives. Since the draft strategy document was posted in December 2025, two comments were received and promptly addressed with version 2.5 made available to the CCQM prior to the meeting. Due to a minor administrative routing issue, additional comments from METAS were received only during this meeting and it was agreed they would be reviewed by the CCQM SPWG at its next meeting and any changes required within the strategy document will be implemented in the next version. Following the presentation, Dr Park thanked the authors for their efforts in drafting the comprehensive document.

7.2. Discussion and approval of CCQM Strategy document

The CCQM approved the CCQM 2030+ strategy document (version 2.5).

8. Reports from the CCQM Working groups

8.1. CCQM Working Group on Protein Analysis (CCQM-PAWG)

[[CCQM/2026-10](#)] [[CCQM/2026-46](#)] Dr Swart presented. She reviewed the recent PAWG activities, noting meetings held in Rockville in September 2025 and Paris in April 2026. The updated PAWG strategy now encompasses the development of reference measurement procedures for high-purity peptides and proteins, quantitative analysis in complex matrices, activity measurements, and higher-order protein structures. PAWG continues to operate through specialized TGs. TG1 focuses on peptide and protein purity, with studies on parathyroid hormone (PTH), IgG, and human serum albumin (HSA). TG2 addresses proteins in complex matrices, with a long-term strategic goal of establishing generic CMC claims. TG3 focuses on protein structure and activity, exploring areas like post-translational modifications, structural assemblies, and binding affinities. TG3 also recently hosted a mini workshop on protein structure. Additionally, Dr Swart announced the formation of a fourth TG during the meeting to explore potential proteomics studies.

Dr Swart highlighted several key comparisons and pilot studies currently under way. For CCQM-K186/P238 (Total haemoglobin in whole blood), the study has advanced to a Draft B report. Due to a wider dispersion of results than anticipated, Dr Swart noted that CMC claims derived from this study will require the inclusion of dark uncertainty calculated via the NIST decision tree. This study also served as a successful case study for generating machine-readable reports and Digital Calibration Certificates (DCCs) by utilizing an API connected to the NIST decision tree. For CCQM-K115.d/P55.2.d (PTH in solution), the Draft A report revealed challenges with host cell proteins and structural impurities, which necessitated careful corrections by the pilot laboratory. Dr Swart reported highly encouraging results from the CCQM-P257 "fire drill" exercise, which evaluated the community's rapid response capabilities for pandemic preparedness. Participants successfully sourced, characterized, and value-assigned a specific target protein within a tight timeframe before shipping it to the coordinating laboratory (NRC) for intercomparison. Finally, PAWG proposed the creation of new CMC subcategories to better reflect their measurement space. Regarding the unexpectedly high levels of impurities in the CCQM-K115 study, Dr Ellison raised a procedural concern about whether comparisons with such significant, unforeseen challenges should be downgraded to pilot studies. Dr Swart acknowledged that participants encountered unexpected complexities accounting for host cell proteins and structural impurities, prompting the PAWG to establish new requirements for minimum purity values for future purity study materials and to plan step-by-step capacity-building studies. Dr Wielgosz clarified that K115 was actually a primary calibrator concentration study and highlighted the comparison's value, noting that the challenges successfully identified areas for improvement in NMIs' capabilities to measure host cell proteins and provided valuable insights. It was agreed that while the study remained a valuable measure of current analytical capabilities, future collaborative activities must adopt stricter, commercial-style material specifications early in the process to ensure robust material suitability.

8.2. CCQM Working Group on Nucleic Acid Analysis (CCQM-NAWG)

[[CCQM/2026-29](#)] [[CCQM/2026-47](#)] Dr Huggett presented. He reviewed the focus of NAWG, which measures nucleic acid sequences, their modifications, and their fractional abundances across diverse applications such as clinical diagnostics, food authentication, and advanced manufacturing. He noted the recent publication of two completed studies: the CCQM-P94.3 on DNA methylation and the CCQM-P232 "fire drill" exercise. He highlighted several studies nearing the Draft B stage, including CCQM-K86.d (relative quantification of genomic DNA in a high-protein matrix), CCQM-P231 (species-specific meat composition), and CCQM-K189 (single nucleotide variations in cancer biomarkers).

Dr Huggett emphasized the significance of the CCQM-P244 study, which represents NAWG's expansion into the therapeutic space by analysing encapsulated RNA within lipid nanoparticles. He acknowledged the substantial variation observed in RNA copy number concentration measurements and encapsulation efficiencies among participants, stressing the need for the community to improve these advanced therapeutic measurements. He also highlighted the CCQM-K190 study, which evaluates SARS-CoV-2 RNA copy number ratios in whole virus suspensions, uniquely linking metrological efforts with WHO International Standards and establishing a

foundation for reporting per-unit volume measurements. Furthermore, he described the upcoming CCQM-K198 study on cell-free DNA measurement for liquid biopsies, a critical application for non-invasive cancer monitoring and prenatal testing. He described progress on the CCQM-K199 comparison, to demonstrate NMI capabilities for orthogonal methods for DNA and RNA high concentration calibration solutions, currently led by NMIA, and future expansion of the comparison series, for which additional support in future BIPM activities had been requested by the NAWG. Dr Huggett proposed three new comparisons for approval: a follow-up study on small deletions in the EGFR cancer biomarker, a key comparison on measuring transgene messenger RNA (mRNA) gene expression in purified total RNA, and a pilot study on measuring DNA (such as antimicrobial resistance genes) directly from whole bacteria. NAWG has requested the addition of specific KCDB service subcategories. The next NAWG meeting will be held jointly with PAWG and CAWG in Pathum Thani, Thailand, in October 2026.

In the discussion, it was agreed that the WG requests for new service categories will be delegated to the CCQM SPWG for a decision.

8.3. CCQM Working Group on Cell Analysis (CCQM-CAWG)

[[CCQM/2026-12](#)] [[CCQM/2026-48](#)] Dr Braybrook presented. He highlighted the group's steady growth to an average of approximately 40 attendees. CAWG's scope encompasses the measurement of cells, pathogens, and derived or engineered entities (such as viruses and synthetic analogues) across domains including health and life sciences, environmental monitoring, and food safety. Dr Braybrook outlined the group's working framework, detailing measurands like cell number concentration, surface density, and fractional abundance in diverse matrices ranging from suspensions to 3D materials. He reviewed several completed or nearly completed studies, including CCQM-P217 on the enumeration of fixed peripheral blood mononuclear cells (PBMCs), CCQM-P205 on membrane-intact *E. coli* in water, CCQM-P222 on particle number concentration, and CCQM-P197 on proliferative mesenchymal stromal cell numbers per unit area. Dr Braybrook then detailed upcoming activities recently approved by the CAWG. CCQM-P260 will focus on the absolute count and ratio determination for T-cell sub-population immunophenotyping, a critical assay for diagnosing infections and malignancies, and quality control in CAR-T cell therapies. CCQM-P261 will pioneer an *in silico* 3D spheroid cell characterization study for drug discovery, where participants will analyse image slices to determine cell number, volume, and surface area. He also noted the approval of CCQM-K206/P266, which will enumerate viable *E. coli* in drinking water. Furthermore, Dr Braybrook shared the outcomes of a highly successful three-part virtual workshop on extracellular vesicles, which explored biomarker characterization, therapeutic potential, and regulatory frameworks. The findings from this workshop will be compiled into a report and submitted to a special issue of the *International Journal of Molecular Sciences*, potentially paving the way for a future pilot study on EV measurement. Finally, he reiterated CAWG's request for a new CMC category with specific subcategories to better organize future claims. During the subsequent discussion, Dr Mester inquired if the working group plans to address nominal properties within their measurement space, particularly in light of

the JCGM drafting new language for nominal properties in the VIM. Dr Braybrook acknowledged the importance of the topic, noting that CAWG will review its broader strategy over the next several months to identify which cell properties are useful to consider before determining if they strictly fit the committee's scope. Dr Mester urged the WGs and member NMIs to closely review the proposed VIM Chapter 6 and provide feedback to ensure the new infrastructure and language accurately reflect their bioanalytical fields. Recognizing the potential impact of these changes, Dr Wielgosz concluded the discussion by establishing an action item for CCQM members to carefully review and submit comments on the new VIM nominal property definitions prior to the August deadline.

8.4. CCQM Working Group on Surface Analysis (CCQM-SAWG)

[[CCQM/2026-19](#)] [[CCQM/2026-49](#)] Dr Shard presented. SAWG focuses on spatially resolved chemical analysis at the micro- and nanoscale, primarily to support the advanced materials industry, including microelectronics and semiconductors. SAWG's primary aims are precise compositional measurement of thin films, high-lateral-resolution chemical mapping, measurement of highly porous materials, and advancing nanoparticle chemical metrology in concert with other working groups. Due to the difficulty of sourcing appropriate nanoscale materials, SAWG currently has only one CMC under review (for hafnium oxide thickness on silicon) and conducts a limited number of KCs. The group aims to design KCs that demonstrate broad capability across various elemental analyses and matrices to support wider CMC claims. Dr Shard reviewed the status of several pilot studies. CCQM-P229 (measurement of mole fraction in Pt-Ni alloy films) is complete, with results showing excellent agreement between participants using different techniques. Traceability was established via isotope dilution ICP-MS (provided by KRISS) and Rutherford backscattering; this will advance to a KC in 2026. A repeat KC (CCQM-K136.2025) on the porosity properties of nanoporous silica is under way, with Draft A expected by the end of April 2026. Additionally, a pilot study (CCQM-P230) on measuring light elements (C, N, O, F, S, P) on the surfaces of ionic liquids using EDS and XPS is yielding promising initial results, successfully testing the ability to quantify these challenging elements. Finally, SAWG has initiated a pilot study (CCQM-P259) in conjunction with OAWG to measure surface amine groups on silica nanoparticles, comparing quantitative NMR with surface analysis methods like XPS. Dr Shard highlighted the conclusion of the joint IAWG-SAWG Task Group on nanoparticles, which produced a roadmap and recommended the formation of a unified Particle Metrology Task Group at the CCQM level to address measurands like refractive index, density, and surface charge. He also announced the creation of a new SAWG Task Group on 2D materials, which are critical for future semiconductor devices and present unique chemical measurement challenges. This TG aims to identify stakeholder needs, collate important measurands, assess current SI traceability, and propose cooperative research activities or pilot studies, with a goal to deliver a final written report by April 2027.

During the discussion following the SAWG presentation, Dr Beers asked if the ionic liquid pilot study could address trace level detection limits for heteroatoms like sulphur, phosphorus, and fluorine, as stakeholders are often interested in very low concentrations. Dr Shard clarified that the current study is not designed to test the

limits of detection (LOD) but rather to establish fundamental traceability and underpin CMC claims for measurements at or above 0.1 atomic percent. Dr Lee posed a question on the practical measurement services anticipated for 2D materials like graphene. Dr Shard explained that key measurands include coverage, defect density, number of layers, and the impact of dopants and transfer agent residues, all of which require spatially resolved, SI-traceable measurements to ensure proper functioning in device stacks. The conversation then shifted to the procedural management of TGs and WGs. Dr Braybrook expressed reservations about creating a new WG for particles, suggesting that such activities should remain within existing WGs. However, Dr Shard noted that a dedicated group would be beneficial to consolidate distributed expertise, pointing out that some groups rely on less suitable methods (like dynamic light scattering for precise sizing) simply because they lack access to the specialized metrological knowledge housed elsewhere. Dr Wielgosz proposed that to progress the request of the Microplastics TG, it should draft new terms of reference to maintain its stakeholder identity, but organize its pilot study under the SAWG to adhere to established approval protocols. Regarding the broader Particle Metrology proposal, Dr Wielgosz recommended that SAWG draft terms of reference to be evaluated by SPWG, which will determine if a TG or a permanent WG is more appropriate. The CCQM agreed to delegate the discussion of these issues to SPWG before a final proposal is presented to the CCQM.

8.5. CCQM Working Group on Electrochemical Analysis and Classical Methods (CCQM-EAWG)

[[CCQM/2026-15](#)] [[CCQM/2026-51](#)] Dr Seitz presented. EAWG benchmarks capabilities in pH, classical chemical methods, coulometry, and electrolytic conductivity. Dr Seitz noted that CCQM-K169 comparison on sodium oxalate reductants has achieved Draft B status despite past logistical challenges. Additionally, a breakthrough was made in the legacy pilot study CCQM-P228, which uses electrochemical impedance spectroscopy (EIS) for conductivity measurements; evaluation of the complex frequency response data identified three primary spectral types, establishing a foundation for a harmonized analytical procedure. To ensure comprehensive measurement coverage, EAWG employs a rotating schedule for key comparisons across its disciplines, such as alternating between "core" and "extended" pH buffers to cover the entire pH scale over a ten-year cycle. EAWG members submitted 22 CMC claims for the 2026 cycle, with 10 accepted for fast track and the remainder requiring minor revisions. EAWG has formalized a re-review strategy granting a three-year grace period for CMCs supported by outdated comparisons, after which unsupported claims will be archived. Furthermore, new guidelines stipulate that comparisons exhibiting significant over-dispersion must incorporate "dark uncertainty" to adjust participant uncertainties accordingly. Finally, Dr Seitz addressed emerging metrological needs, including battery characterization and ion activity standards. EAWG attempted to form an internal TG on biosensors, but they were unable to find a chair. EAWG's internal TG on metrological traceability for seawater pH and pH_T values will continue its work on calibration guides and stakeholder engagement. Emphasizing the broader seawater CO_2 system, he noted that the oceanographic community currently relies on a single reference material functioning as an un-traceable calibration. To rectify this gap, several NMIs are

actively developing facilities to provide robust, traceable Certified Reference Materials for ocean observation.

8.6. CCQM Working Group on Isotope Ratio (CCQM-IRWG)

[[CCQM/2026-35](#)] [[CCQM/2026-50](#)] Dr Mester presented. IRWG focuses on the precise measurement of minute variations in isotopic compositions driven by physical, chemical, and biological processes. He highlighted a significant achievement that addressed the community's lack of a unified language: IRWG's TG on Quantities, Units, and Symbols published a consensus guidance document in 2023, through a subsequent IUPAC project initiated in 2024, these standardized terms are now being incorporated into the upcoming edition of the IUPAC "Green Book". Another major challenge for the isotope ratio community has been the lack of clear points of reference for measurements. Dr Mester detailed how IRWG, in collaboration with the BIPM and an IAEA expert group, has established explicit scale definitions for key light isotopes, such as the carbon-13 VPDB scale, anchored to specific reference materials. He emphasized the critical need to expand this effort to the 50-60 other stable isotope systems and to create a centralized, FAIR-compliant infrastructure to house these measurement scales. He urged NMI directors to support the BIPM's 2028-2031 work programme, which includes the development of an isotope scale database. Dr Mester underscored the importance of metrological rigour, citing a recent case where an ill-defined scale addition caused a 20-sigma shift in carbon isotope measurements that went unnoticed for two decades. Dr Mester also reviewed the IRWG's active portfolio of comparisons, highlighting the CCQM-K182/P233 study on lithium isotope measurements (both relative deltas and absolute SI-traceable ratios) in pure and matrix materials. CCQM-K183/P234, piloted by PTB and BAM, represents an effort to validate atomic weight determinations using copper as a model. Upcoming studies will increase in complexity, moving from bulk to compound-specific measurements (e.g., carbon and nitrogen in synthetic mixtures) and expanding coverage to sulphur and strontium. Dr Mester also reported on a successful joint workshop with the OAWG held in April 2026, "Isotope Ratio Measurements by Fourier Transform MS", which explored the application of ultra-high-resolution Fourier Transform mass spectrometry (such as Orbitraps) for isotope ratio measurements, a technology crucial for advancing both groups' capabilities in complex matrices.

During the discussion, Dr Camin highlighted the successful collaboration between the IAEA, the BIPM, and the working groups to define the carbon isotope delta scale and establish a standard template for scale definitions. Noting that these scales have already been endorsed by IUPAC, she inquired if the CCQM could begin a process to formally recommend or endorse them as well. Dr Mester praised this foundational work—noting that the paper summarizing the effort, led by Dr Camin, recently won a CITAC best paper award. In response to her question, Dr Mester explained that rather than endorsing a few light isotope scales piecemeal, IRWG intends to address scale endorsement holistically. This will be integrated into the broader database and traceability effort, with the goal of defining and recognizing all of the approximately 60 major delta scales as a comprehensive package following consultation with the wider community. Dr Camin expressed her support of this initiative.

8.7. CCQM Working Group on Gas Analysis (CCQM-GAWG)

[CCQM/2026-07] [CCQM/2026-52] Dr Brewer presented. GAWG enables comparability for measurements of gas composition, isotope ratios, gas/liquid mixtures, and particles/aerosols. GAWG is also addressing emerging challenges including carbon capture, the hydrogen economy, breath analysis diagnostics, and sustainable fuels. He noted that post-pandemic, meeting attendance has rebounded strongly, with roughly a total of 100 participants joining in-person or virtually at recent meetings held alongside the CCQM-IRWG. He also highlighted the recent Gas Analysis Symposium 2026, which featured a roundtable on the future of the field, reinforcing the growing importance of metrology in breath analysis and diagnostics. Dr Brewer provided an overview of GAWG's comparison portfolio. Over the past year, the group successfully published CCQM-K175 (HCl in nitrogen, the first of its kind), CCQM-K10.2018.1 (BTEX in nitrogen), and CCQM-K3.2019.1 (automotive gases). GAWG maintains a highly active schedule, with numerous key comparisons across various tracks currently at the Draft A stage. GAWG has recently optimized its CMC review and comparison archiving strategies. By tracking the relative mean degree of equivalence (DoE) across its 50 published key comparisons, GAWG has quantified the relative difficulty of different measurements. This analysis confirms that "Track A" components generally achieve uncertainties around 0.1 %, while reactive components or those at low amount fractions are significantly more challenging. This approach allows GAWG to refine its strategy, potentially broadening Track A components and adjusting the frequency of comparisons to maintain robust capabilities more efficiently. GAWG has formalized a process to archive key comparisons older than 15 years or those superseded by newer studies, prompting immediate review and update of the corresponding CMCs by participating laboratories. Dr Brewer detailed the progress of GAWG's internal TGs. The TG on Ozone Cross-Section Change Management successfully concluded its work, culminating in the global implementation of the new CCQM.03.2019 value in January 2025—a change that updates legislation, CMCs, and the BIPM.QM-K1 comparison to improve global air quality measurements. The TG on Greenhouse Gas Scales is working to establish and compare alternative scales to the NOAA global reference, enhancing the robustness of long-term CO₂ tracking. The TG on Advanced Spectroscopy is exploring alternatives to traditional mass and manometric approaches, demonstrating the feasibility of highly accurate determinations of molecular line intensities, with a shifting focus toward CO₂. In collaboration with the IRWG, the Isotope Ratio Metrology TG published a white paper and hosted a workshop to align with stakeholder needs for CH₄ and CO₂ measurements. The Aerosol Metrology TG has developed a comprehensive roadmap spanning bio-aerosols, chemical composition, and particle mass/number, identifying areas like environmental DNA (eDNA) for future collaboration with NAWG and SAWG. A recently formed TG on Passivation Chemistry aims to understand and control the degradation of gas mixtures in high-pressure cylinders—crucial for decadal stability in climate monitoring—by collating knowledge, modelling interactions, and exploring novel passivation treatments. Finally, Dr Brewer announced a new TG focused on Capacity Building to accelerate the development of emerging NMIs, which will convene at the upcoming October 2026 meeting hosted by LACOMET in Costa Rica.

During the discussion, Dr O'Connor inquired whether the strategy of archiving older studies creates challenges for maintaining broad scope CMC claims. Dr Brewer confirmed that it does, explaining that because "Track A" broad claims require participation in three comparisons over a ten-year cycle, the GAWG must occasionally delay archiving a 15-year-old study until a replacement is published to avoid inadvertently invalidating a laboratory's supporting evidence.

8.8. CCQM Working Group on Inorganic Analysis (CCQM-IAWG)

[[CCQM/2026-20](#)] [[CCQM/2026-53](#)] Dr Winchester presented. IAWG focuses on the elemental composition of materials, encompassing elemental speciation and particle metrology. Dr Winchester noted robust attendance at recent meetings, with approximately 85 participants engaging in virtual and hybrid formats. He highlighted the successful, routine implementation of the NIST Decision Tree for calculating Key Comparison Reference Values (KCRVs) and Degrees of Equivalence, which has standardized data evaluation across the working group. IAWG has ongoing efforts to refine CMC guidance and streamline the review process. The IAWG TG on CMC Guidance has proposed simplifying the Core Capability Matrix by removing the arbitrary high/low level sub-divisions; this reduces the number of categories to better reflect actual measurement capabilities. To assist both CMC claimants and reviewers, IAWG developed the "IAWG Record Matrix Dashboard," an Excel-based tool that automatically generates a laboratory's performance record against KCRVs by querying a database of past comparisons. To populate this database with historical data spanning nearly 30 years and 116 comparisons, IAWG collaborated with the NIST AI team. The AI successfully extracted over 20 000 data points from diverse PDF reports into a machine-readable format, significantly reducing the manual workload and demonstrating the utility of AI in CMC administration. The TG is also working to formally define "broad scope" and "narrow scope" claims, as well as the criteria for "direct" versus "indirect" evidence. Dr Winchester then reviewed IAWG's active portfolio of comparisons, tailored to address gaps identified in the Core Capability Matrix. IAWG initiated CCQM-K202/P258 (elements in a metal alloy) to provide fresh evidentiary support, because roughly 80 % of the nearly 200 CMC claims for metals and alloys are over a decade old. Other notable studies in progress include CCQM-K194/P251 (water mass fraction in crystallohydrates)—a cross-disciplinary study emphasizing SI traceability; CCQM-K191/P245 (non-metallic and metallic impurities in copper); and CCQM-K195/P252 (arsenic speciation in foods). Finally, he introduced CCQM-P265A/B, a pair of pilot studies exploring laser ablation ICP-MS for analysing solid glass and gelatin samples, marking IAWG's first foray into this technique. PTB will host the upcoming November 2026 meeting.

During the discussion following the IAWG presentation, Dr Wielgosz suggested that IAWG analyse and publish their data regarding laboratory performance across multiple orders of magnitude of concentration, as it would be interesting to see how it compares to established theories on how uncertainty changes with concentration; Dr Winchester agreed this was a good idea and said the group would now consider it. Dr Sega asked whether the IAWG foresaw possible cooperation with the Consultative Committee for Thermometry (CCT) regarding the measurement of water in materials (CCQM-K194), similar to their experience with the CCRI. Dr Winchester replied that they are open to collaboration but noted that the CCRI

cooperation was discontinued because the two groups were fundamentally measuring different things (radioactivity versus chemical content). The conversation then turned to the potential of AI in managing CMCs and the KCDB. Dr Brewer asked if the KCDB might need more granular structuring to be accessible to AI, given that past efforts aimed to simplify the database. Dr Winchester speculated that more detailed information would likely yield better AI training results. Dr Wielgosz pointed out that while PDF comparison reports are accessible to large language models, the KCDB's CMC data is currently not easily searchable by them, unlike the recently flattened JCTLM database, and asked what changes would be necessary. Dr Gonzalez explained that while training AI is not easy, utilizing techniques like in-context learning or fine-tuning parameters with existing data could eventually eliminate the need for rigid database structuring. Dr Gonzalez suggested that once developed, these AI models could be made available to NMIs to pre-screen their CMC claims before submission, serving as a first filter to address structuring issues early in the process.

8.9. CCQM Working Group on Organic Analysis (CCQM-OAWG)

[[CCQM/2026-30](#)] [[CCQM/2026-54](#)] Dr Fernandes-Whaley presented. OAWG focuses on comparisons that underpin member services in the food, clinical, and environmental sectors, alongside its core capability of value assigning primary calibrators. Dr Fernandes-Whaley emphasized that over 50 % of the OAWG's CMCs are derived from high-purity organics and organic solutions, underscoring the vital contribution of the BIPM Chemistry Department's role in coordinating key comparisons on these and its Capacity Building and Knowledge Transfer (CBKT) programme in supporting these capabilities, especially for developing NMIs. OAWG operates five dedicated TGs focused on food, clinical/toxicology, environment, analytical advances, and CMCs. Dr Fernandes-Whaley reviewed several finalized comparisons. CCQM-K180 (metronidazole in pork muscle) tested high-polarity analytes in high-protein food. While two laboratories' results were not included in the KCRV calculation due to technical challenges related to the complete extraction of incurred veterinary drug residues, the remaining participants demonstrated good agreement. CCQM-K184/P235 (polycyclic aromatic (PAHs) in sediment) tested low-polarity analytes in an abiotic matrix. Five participants were not included in the KCRV calculation primarily due to non-compliance with CIPM metrological traceability requirements for the calibrants used. In response, OAWG has updated its "Practices and Guideline Document" and the Key Comparison Protocol template to provide explicit guidance on traceability requirements and acceptable purity assignments. To address the technical difficulties encountered in these comparisons, OAWG is leveraging its Knowledge Transfer TG to host online training sessions and develop a white paper on best practices. Turning to ongoing studies, Dr Fernandes-Whaley highlighted CCQM-K204 (Vitamin D3 in infant formula), a non-polar analyte in a high-carbohydrate matrix, and CCQM-K154.e (Ochratoxin-A in acetonitrile), the final solution in the K154 CBKT series, which experienced delays due to unexpected impurities arising from ampouling at high temperatures. In the clinical sector, the Draft A report for CCQM-K192/P246 (β -estradiol in human blood serum) is currently under review. Finally, Dr Fernandes-Whaley presented several planned comparisons for CCQM approval. These include CCQM-K148.a.2028 (quinidine) to fill the

non-polar, high-purity organic quadrant; CCQM-K78.a.2027 (polar pesticides in aqueous solution); and a proposal from LGC for sirolimus in whole blood, which would mark OAWG's first study in a whole blood matrix. Additionally, OAWG plans to conduct a Track C multi-component organic solution study (CCQM-K203/P263.b.2025) as a follow-up to CCQM-K78.b to allow NMIs to improve their capabilities, as well as Track D exploratory studies focusing on data processing for complex NMR spectra and assessing instrumentation improvements for IDMS. During the discussion, Dr Brewer inquired about the specific traceability issues in the recent matrix comparison. Dr Fernandes-Whaley explained that NMIs frequently rely on commercial ISO 17034-accredited reference material producers when NMI-sourced materials are unavailable; however, many of these commercial certificates lack demonstrable metrological traceability. To address this systemic issue, she proposed hosting a workshop in early 2027 with key stakeholders—including the newly merged Global Accreditation Cooperation Incorporated (Global ACI) and ISO/TC 334—to develop a joint guidance document on establishing and interpreting metrological traceability. Dr van der Veen suggested expanding the stakeholder outreach to include other relevant ISO committees, such as ISO/TC 158 and ISO/TC 193, which also have established documents and working groups dedicated to metrological traceability.

8.10. CCQM Working Group on Key Comparison and CMC Quality (CCQM-KCWG)

[[CCQM/2026-21](#)] [[CCQM/2026-56](#)] Dr Botha presented. Currently, there are 720 chemistry and biology CMCs under review from Cycle XXVI (2025). Of these, 639 have been published, while others remain in various stages of revision or have been greyed out. Dr Botha noted that issues from previous review cycles are largely resolved, with only a few CMCs requiring final updates from member institutes. Looking ahead to Cycle XXVII (2026), 311 CMCs have been submitted, predominantly from EURAMET and IAWG, covering areas such as gases, inorganic solutions, and food. Dr Botha emphasized the importance of ensuring these reviews are completed effectively, highlighting a planned deadline of the end of May 2026 to complete the JCRB review for the upcoming cycle. Dr Botha discussed the significant workload facing the KCWG, particularly concerning the re-review of CMCs approved prior to 2015. Given the scale of this task—involving hundreds of claims—she presented the scheduled re-reviews extending from 2026 into the 2030s. To manage this burden, the KCWG is looking to automate aspects of the CMC review process. Tasks such as flagging incorrect uncertainty conventions, detecting upper and lower limit errors, and matching CRM ranges to CMC ranges are considered trivial to implement with automated tools. However, assessing compliance with "how far the light shines" statements or verifying certificates of analysis of CRMs will require more sophisticated, potentially AI-driven solutions. Dr Botha noted that the development of these AI tools has been transferred to the CCQM-TG-DD Task team 3, freeing the KCWG Task Group on Tools for CMC Review to focus primarily on creating e-learning modules. These modules will address the technical aspects of writing and reviewing CMCs, including uncertainty conventions, handling poor key comparison performance, and interpreting supporting evidence.

8.11. BIPM Headquarters Programme on Metrology in Chemistry

[CCQM/2026-57] Dr Wielgosz presented. The programme centres on three main roles: comparison coordinator, knowledge transfer, and liaison/coordination. A major operational shift involves transitioning away from large-scale multilateral gas standard key comparisons—with CCQM-K82.2023 (CH₄) being the last of its kind coordinated by BIPM in 2025—towards maintaining stable, ongoing on-demand bilateral comparisons for surface ozone, NO₂, and CO₂ amount fraction and isotope ratios. Consequently, BIPM will discontinue coordination of multilateral gas key comparisons (such as N₂O, NO and HCHO), as NMIs possess the mature capabilities to run these independently. The BIPM will continue to strongly support core capability comparisons for small organics and protein purity, which underpin the traceability hierarchy for the OAWG and PAWG, and will maintain its successful Capacity Building and Knowledge Transfer (CBKT) training initiatives. The resulting reduced workload in the gas programme and expanded activities in support of the organics and proteins area has required a reorganization within the Department to ensure programme delivery. Addressing new strategic areas, Dr Wielgosz highlighted a growing emphasis on digitalization and the bio-sector. Plans include supporting developments in digital standards for quantitative NMR, employing a digital twin model to optimize the global network of ozone standards, and leveraging AI to streamline data entry and review for the JCTLM database, which will see a new web-based platform launched in 2027. In the bio-sector, the programme will expand to support bioengineering and nucleic acid calibrators, establishing SI traceability for digital PCR measurements through comparisons coordinated for the NAWG. He also stated that the BIPM will be supporting the expanded scope of PAWG purity comparisons to include *de novo* peptides and proteins. This expansion is being driven by the rise of "biofoundries"—high-throughput automated facilities that convert genes and proteins into engineered biological systems, as several NMIs are currently setting up these biofoundries to produce materials. Furthermore, the BIPM will develop a dedicated Isotope Ratio Reference Systems (IRRS) Database as requested by the IRWG. Dr Wielgosz stressed that the delivery of this ambitious programme relies heavily on a partnership model involving Joint Technical Projects and visiting scientists. Acknowledging this reliance, he noted strong ongoing support from NMIs, highlighting that seven of the eleven visiting scientists in 2026 were fully funded by their home institutes. He concluded by advertizing current job vacancies, including a technician role for the organic programme, a one-year research fellow position in protein quantification mass spectrometry to address host cell protein challenges, and 12 upcoming visiting scientist opportunities for 2027-2028. During the discussion, multiple delegates expressed strong support and appreciation for the BIPM Chemistry Department's proposed work programme and its partnership approach. Dr Smeulders (NMIA) highlighted anticipated collaborations in the nucleic acid area and the leadership of Dr Burke from NMIA in this area, while Dr Winchester (NIST) and Dr Engelhard (BAM) emphasized the immense value of the BIPM's capacity-building initiatives, such as the qNMR summer schools and visiting scientist opportunities, in helping NMIs maintain capabilities amidst shrinking resources. Dr Camin (IAEA) commended the ongoing cooperation in stable isotope analysis and strongly endorsed the proposed isotope delta scale database, and Dr Cobbaert (IFCC)

stressed the critical importance of the protein work for clinical data exchange and patient management. In response to a question from Dr Gonzalez regarding budget constraints for new digitalization and AI initiatives, Dr Wielgosz explained that the BIPM will rely on targeted partnerships and an internal cross-departmental group to advance these digital efforts. Finally, Dr Koo welcomed the CCQM's vocal endorsements but strongly urged the delegates to ensure their respective NMIs submit this support in writing over the next month, noting that formal written feedback is essential for the CIPM to allocate the necessary resources for the upcoming programme.

8.12. CCQM Task Group on KCRV estimation (CCQM-TG-KCRV)

[[CCQM/2026-58](#)] Dr Ellison presented. The mandate of this TG is to revise and update guidance note CCQM13-22. The updated document will feature a "decision tree" flowchart for selecting KCRV estimators, graphical inspection tools (such as consistency plots), and stronger recommendations regarding Bayesian estimators. A primary focus of the revision is clarifying the interpretation of "dark uncertainty" in relation to CMC claims. Using a simulated data set, Dr Ellison demonstrated how incorporating an excess variance term into DoE calculations can misleadingly suggest that all laboratories agree with the KCRV, masking underlying inconsistencies. He emphasized that while degrees of equivalence including excess variance provide the correct uncertainty of the differences, they can be misleading when assessing whether a study supports a laboratory's reported uncertainties. The new guidance will advise reviewers to prioritize the underlying agreement between laboratories over unilateral degrees of equivalence when excess variance is present. CCQM-TG-KCRV will provide the draft to CCQM by 31 May 2026, the TG will address comments and SPWG will decide if comments are adequately addressed and decide on approval. The TG will be closed after approval of the document.

8.13. CCQM *ad hoc* Working Group on the Mole (CCQM-ah-WG-Mole)

[[CCQM/2026-06](#)] [[CCQM/2026-59](#)] Dr Brown presented. Following CCQM approval at the last meeting, Version 2 of the *mise-en-pratique* for the definition of the mole was published in May 2025, accompanied by a detailed paper explaining the updates. Additionally, Version 3.02 of the 9th edition of the SI Brochure was published in August 2025. This update reflects the 2022 CODATA value for the Dalton, adds new binary prefixes (robi and quebi), and updates the license to Creative Commons Attribution 4.0. Crucially, each edition of the SI Brochure now has its own Digital Object Identifier (DOI) and dedicated landing page (with version history for the 9th edition), which significantly improves referencing and citation capabilities. Dr Brown noted that the mole remains arguably the least well-understood SI base unit and encouraged CCQM colleagues to continually advocate for its importance. Dr Brown also reported excellent progress from the TG on Terms, Quantities and Units for Bioanalytical Measurement (TG-TQUB), chaired by Dr Huggett. The TG-TQUB has completed its stakeholder consultation and literature review, compiling a comprehensive list of relevant units and quantities for each bio-analytical working group area. This list forms the basis of a first-draft guidance document styled after an ISO/IEC 80000 standard, which will soon be circulated for feedback. Looking ahead,

the TG plans to distribute targeted questionnaires to stakeholders to further refine the guidance and continues to curate a full database of examples and references, with the long-term goal of formalizing the document as a new ISO 80000 series standard in collaboration with ISO/TC 12.

During the discussion, Dr Swart suggested that in addition to compiling a list of units used in the bio area, the TG should also evaluate their practical utility and highlight potential issues. She noted, for example, that using mass concentrations can be problematic for biomolecules when the molar mass is unknown. Dr Brown agreed that this would be a valuable consideration for the TG to take forward. Dr Braybrook then reminded the attendees to distribute the working group-specific unit lists to their broader communities to maximize feedback, corroborate existing data, and identify any missing gaps. Finally, Dr Park thanked Dr Brown and the Consultative Committee for Units (CCU) for their dedication to biosystem units, acknowledging that while it is an untraditional role for the CCU, their attention to this area is highly appreciated.

8.14. Approval of proposals for CCQM Comparisons

[[CCQM/2026-13](#)] There were 17 proposed comparisons, all of which are in line with the CCQM Strategy document. The CCQM approved all proposed comparisons.

9. CC Governance and Operational Issues

9.1. Applications for CCQM Member/Observer Status

The committee reviewed the pending membership application from INM Colombia, which was received the previous year. A TG chaired by Dr Botha evaluated the application based on the institute's status, research publications, and participation in relevant working groups. Following Dr Botha's report that INM Colombia successfully met all criteria, the CCQM formally approved their application for member status. The proposal will now be forwarded to the CIPM at its next meeting. CCQM received an application from LACOMET the week prior to the plenary, the data will be reviewed for a decision at the 32nd CCQM Meeting.

9.2. Rapporteurs for CCQM WGs

The CCQM discussed the essential role of rapporteurs in CCQM WGs for accurately recording decisions and actions. Acknowledging that some WGs occasionally struggle to recruit for this position, the SPWG proposed formally appointing rapporteurs for fixed terms, which would allow NMIs to adequately plan and budget for their attendance. Furthermore, the proposal included increasing the visibility of rapporteurs by listing their names on the BIPM website and integrating their appointment into the formal procedural process alongside new WG chairs and vice-chairs. During the discussion, Dr Brewer asked if the rapporteurs' terms would align with the upcoming 2027 terms for working group chairs and vice-chairs. It was clarified that because serving as a rapporteur requires a significant financial and time commitment from the supporting NMI, the position will operate on a rotating

schedule contingent upon ongoing NMI agreement. The CCQM formally approved the proposal to integrate the rapporteur role into its standard procedures.

9.3. CCQM-TG-NMMS

CCQM formally approved the following way forward for the Nano- and Microplastics Measurements and Standards Task Group: the group will maintain its identity and update its terms of reference to continue its stakeholder engagement, but its planned pilot study will be registered and processed through SAWG. Participants for this study can be drawn from any relevant working group, ensuring broad collaboration without proliferating administrative structures. The new terms of reference for the TG-NMMS will be discussed within the SPWG. Dr Brewer expressed support for this approach but noted that within the GAWG, particle metrology represents a very small portion of their work, making it difficult to attract the right experts to those specific meetings, and highlighting a broader CCQM challenge of addressing specialized cross-cutting topics. Dr Winchester agreed, explaining that while joint sessions between two working groups are manageable, coordinating across more groups is highly difficult; thus, having SAWG host the pilot study is a practical stopgap until the SPWG determines the long-term organizational strategy for particle metrology.

The discussion then shifted to the procedural handling of key comparisons. Dr Seitz pointed out that the CIPM MRA guidelines, dictate that decisions on Reference Values and Degrees of Equivalence should be made primarily by the comparison participants, rather than the whole WG. He advocated for a clearer separation of responsibilities, empowering participants to reach a Draft B stage before presenting it to the working group for final review. Dr Wielgosz agreed that this is increasingly becoming best practice, especially with the use of online meetings for participant discussions prior to working group review, but he emphasized the need for flexibility to accommodate different group dynamics. Dr Swart concurred, noting that in smaller groups like the PAWG, open discussions within the entire working group are highly beneficial for shared learning. The committee agreed to remain pragmatic while the SPWG further refines these guidelines.

9.4. Timeline for appointment of CCQM President and WG Chairs (2027-2031)

Dr Park noted that he planned to conclude his term as CCQM President after the upcoming CGPM and the appointment of a new CCQM President will be needed in March 2027.

In preparation for the 2027–2031 cycle of WG Chair appointments, updated paperwork detailing the required competencies, institutional support requirements, and deadlines for leadership roles will be circulated to all CCQM members in June, with nominations for WG Chairs and Vice Chairs due by September 2026.

Regarding the selection process for WG Chairs and Vice Chairs, current leaders willing to continue will automatically be included in the candidate pool. New expressions of interest will also be added to this pool, provided the applicants meet the circulated criteria. Dr Park and Dr Wielgosz will review the candidates and recommend a finalized slate to the incoming CCQM President. The new President

will then formally propose the WG Chairs for final CCQM approval at the April 2027 meeting. Additionally, the committee clarified that WG Rapporteurs will be appointed directly by their respective WG Chairs, rather than going through the formal CCQM approval process.

9.5. Proposed Workshop on Metrological Traceability on CRM Certificates

In explaining in the need for the workshop, Dr Fernandes-Whaley noted that, despite the existence of standard ISO 17034, metrological traceability requirements did not always seem uniformly applied by commercial producers, and this could be addressed through guidance and a dedicated workshop. Dr Wielgosz pointed out that the JCTLM database already sets precedents for assessing commercial reference materials and that such action aligns with the BIPM's MoU with ILAC (now part of Global ACI) to ensure global measurement equivalence. Dr Seitz agreed that ILAC Document P10—which dictates traceability routes for accreditation—would be a focal point for discussion. However, other members expressed reservations about the CCQM taking the lead on this issue. Dr Mester questioned whether the CCQM was overstepping its boundaries, suggesting that this is fundamentally a standard-writing and accreditation enforcement issue that should simply be flagged to organizations like ISO and ILAC, rather than managed through a CCQM workshop. Dr Winchester echoed these concerns, arguing that the CCQM might better utilize its resources by working internally within ISO/TC 334 rather than adding another workshop to an already crowded schedule.

10. Reports from RMOs

10.1. AFRIMETS

[CCQM/2026-09] [CCQM/2026-60] Dr Botha presented. She noted that AFRIMETS continues to expand its footprint in metrology in chemistry. Notably, NIS published 20 new CMCs in 2025, covering anions in water, platinum group elements in autocatalysts, and heavy metals in food. Furthermore, LNMCI-INRAP and KEBS have been actively participating in comparisons and submitting CMCs for mycotoxin and aqueous ethanol solutions, respectively. AFRIMETS is coordinating a supplementary comparison, AFRIMETS.QM-S1 for polar to non-polar pesticides in yellow plum, and is offering numerous sponsored proficiency testing schemes covering mycotoxins, elements in fish, and forensic blood alcohol testing. Capacity building remains a strong focus, with NMISA providing hands-on training courses in food safety testing to scientists from Gambia and Malawi, as well as contracted training on ISO 17034 for reference material production to KEBS and LNMCI-INRAP.

10.2. APMP

[CCQM/2026-23] [CCQM/2026-62] Dr Teo presented. She highlighted APMP's comparison and pilot study portfolio, which is closely aligned with the organization's strategic focus areas: climate change, food safety, water safety, and health product safety. Key studies include those on automobile emission gases, histamine in fish, non-polar pesticides in water, and sibutramine/dexamethasone in dietary

supplements. APMP focuses heavily on stakeholder collaboration and capacity building, demonstrated by their active Focus Groups and numerous joint workshops across the region. HSA recently hosted an APEC workshop on clinical markers for non-communicable diseases and NIMT hosted a joint APMP-AOAC SEA workshop on food safety. Finally, Dr Teo highlighted a significant APMP Public Health Initiative that engaged 44 clinical laboratories and 10 IVD manufacturers across six economies, utilizing value-assigned materials from several NMIs to assess the measurement of critical clinical markers like glucose, cholesterol, and creatinine.

10.3. COOMET

[[CCQM/2026-25](#)] [[CCQM/2026-63](#)] Dr Kustikov presented. He reported on the activities of COOMET TC 1.8 "Physico-Chemistry," detailing participation from 22 NMIs across 17 Member States. Regarding CMCs, COOMET member countries hold a substantial number of claims, with 357 in Gas Analysis alone. In the recent XXVI cycle (2025), VNIIM submitted several new and revised CMCs across gas, inorganic, organic, and bioanalysis. Dr Kustikov highlighted several ongoing COOMET projects, such as key comparisons for automotive exhaust gases (COOMET.QM-K3.2019) and natural gas (COOMET.QM-K118), alongside various pilot studies. Additionally, he provided an update on COOMET TC 1.12 (Reference Materials), which currently maintains a register of 150 CRM types from five member nations and works to support ISO 17034 compliance.

10.4. EURAMET

[[CCQM/2026-24](#)] [[CCQM/2026-61](#)] Dr Näykki presented. The EURAMET Technical Committee for Metrology in Chemistry (TC-MC) currently includes 22 European NMIs and 21 associate member DIs. Recently, four Ukrainian DIs were accepted as Associates, and Uzbekistan (UzNIM) became the first "Associate NMI" from another RMO. EURAMET's strategy emphasizes tackling horizontal issues of common concern—such as climate, energy, and health—through its 12 established European Metrology Networks (EMNs), which develop Strategic Research Agendas to guide research efforts. In terms of CMC reviews, the TC-MC successfully processed 165 CMCs across five working groups during the Cycle XXVII intra-regional review, with 151 ultimately submitted to the JCRB. To further its capacity-building efforts, EURAMET will host a Summer School on Biochemical Metrology in August 2026. Finally, he noted that Dr Florbela Dias from IPQ, Portugal will be the new TC chair.

10.5. GULFMET

[[CCQM/2026-18](#)] Mr Abdulrahman Alaskar submitted a report on the recent activities of the GULFMET Technical Committee for Chemical Metrology (TCQM). Membership includes seven Gulf states and several associate members, with China also expressing an interest in joining. The TCQM conducted several CMC reviews over the past year and held an online meeting on 22 April 2025 to discuss regional capability building. During this session, Türkiye proposed evaluating member training needs, Egypt suggested a gas measurement workshop, and KRISS introduced its Global Metrology Academy (GMA) programme. Coordination of these training initiatives is ongoing, and the next TCQM meeting is scheduled for May 2026. Regionally, the GULFMET.QM-S1 supplementary comparison (measuring benzoic and

sorbic acid in ketchup) is under way; results are due 29 May 2026, with a Draft A report expected in September 2026. Additionally, GULFMET is planning two gas comparisons and is actively discussing pilot responsibilities with IPQ and NMISA.

10.6. SIM

[[CCQM/2026-28](#)] Dr Calderón Jiménez presented. SIM Metrology Working Group 8 (MWG-08) launched a new website that centralizes information on organizational structure, technical areas, comparisons, and key documents. MWG-08 also conducted a comprehensive regional diagnostic to establish a baseline of metrological needs and gaps. This diagnostic revealed strengths in traditional areas (inorganic, organic, gas, food) but highlighted a critical need for capacity building in emerging fields like clinical biomarkers, bioanalysis, and nanometrology. To streamline the CMC review process, MWG-08 analysed comments from the KCDB, finding that 70 % were related to measurement uncertainty, and subsequently developed a new "Practical Guide for CMC Review" with technical checklists to help NMIs proactively avoid common errors. Dr Calderón also reviewed the status of SIM comparisons and highlighted the region's strong focus on inorganic metrology, while acknowledging the need to expand participation in organic and emerging metrology areas.

11. Discussion and questions on written reports from International Organizations in liaison with the CCQM

11.1. International Atomic Energy Agency [IAEA]

[[CCQM/2026-33](#)] [[CCQM/2026-65](#)] Dr Camin presented. She highlighted the long-standing cooperation between the BIPM and IAEA formalized by the CIPM MRA and a 2012 MoU. In support of the GAWG and IRWG, the IAEA's Terrestrial Environmental Radiochemistry Laboratory assigned isotopic values (on the VPDB scale) to BIPM CO₂ cylinders and is producing RMs to define and realize stable isotope delta scales. Dr Camin also noted recent publications, including an IAEA TECDOC on measuring stable carbon isotope ratios in atmospheric CH₄ and an award-winning paper proposing formalized definitions for carbon and oxygen isotope delta scales (VPDB, VSMOW-SLAP) inspired by the SI Brochure. The IAEA is co-organizing (with NIST) CCQM-K193/P247 for $\delta(^{13}\text{C})$ and $\delta(^{15}\text{N})$ values in various matrices and is collaborating with JSI to prepare candidate materials for a future IAWG key comparison on trace elements in marine sediment.

11.2. European Commission Joint Research Centre [JRC]

[[CCQM/2026-32](#)] [[CCQM/2026-68](#)] Dr Koeber presented. The JRC continues its active participation in EURAMET technical committees and European Metrology Networks, including those focused on traceability in laboratory medicine and pollution monitoring. JRC experts are involved in several CCQM working groups, including the NAWG, IAWG, PAWG, and OAWG. JRC currently holds CMCs relevant to NAWG and IAWG. Recently JRC proposed coordination of a new pilot study in NAWG on bacterial plasmid DNA extraction and quantification for antimicrobial-resistance wastewater surveillance. In the OAWG, the JRC co-coordinated the

CCQM-K192/P246 key comparison on 17 β -estradiol in human serum alongside PTB, using the same material that will also become a new CRM. JRC is assisting the PAWG with discussions on a study on purified human serum albumin and participating in CCQM-TG-NMMS to potentially provide study materials for an upcoming pilot study. JRC remains a prominent producer of reference materials, currently offering approximately 700 different reference materials under the BCR, ERM, and EURM brands to support health care, security, environmental monitoring, and food and feed safety. The JRC collaborates closely with the clinical sector through the IFCC and JCTLM to reduce method variability and participates in numerous ISO and CEN technical committees. In 2025, JRC-Geel maintained its accreditations according to ISO/IEC 17025, ISO/IEC 17043, and ISO 17034, with its accredited portfolio now encompassing a wide variety of matrices ranging from biological materials to solid industrial goods.

11.3. International Union of Pure and Applied Chemistry [IUPAC]

[[CCQM/2026-34](#)] [[CCQM/2026-67](#)] Dr Ellison presented. He highlighted the forthcoming General Assembly and World Chemistry Congress in Kuala Lumpur (2025) and internal organizational changes, including a new dual-centre European-based secretariat. The IUPAC Global Women's Breakfast continues to be a major success, with the 2026 event drawing 30 000 participants across 417 registered events in 63 countries. The presentation also noted the "Top Ten Technologies 2025" and the open call for 2026 proposals. Dr Ellison outlined several ongoing metrology-related projects, including the "IUPAC Brief Guide to Metrological Terms in Chemistry" and a project on defining terminology and quantities for isotopic analyses. Newly initiated projects include harmonizing strontium isotope data for certified reference materials to ensure traceability to SRM 987 and developing terminology for quantities describing mixture compositions. Finally, he highlighted a recently published IUPAC/CITAC Technical Report guiding interlaboratory comparisons of categorical (qualitative and ordinal) characteristics of substances.

11.4. ISO TC/334- Reference Materials

[[CCQM/2026-22](#)] [[CCQM/2026-66](#)] Dr Botha presented. She outlined the current structure and status of the new ISO 33400 series of standards, which replaces the previous ISO Guide series (ISO Guides 30 to 35) for reference material production and use. Recently, the committee published several key updates, including ISO 33401 (contents of certificates), ISO 33403 (requirements and recommendations for use), ISO 33405 (characterization as well as assessment of homogeneity and stability), and ISO 33406 (production of qualitative reference materials). ISO/TC 334 is revising ISO/TR 79 to update and add qualitative reference material examples that comply with ISO 33406. The committee also formed an *Ad Hoc* Group to develop guidance on the content of metrological traceability statements for certified values on reference material certificates. Furthermore, Dr Botha and Dr He recently co-convened the first meeting of the newly established ISO/CASCO/JWG 43. This joint working group has started revising ISO 17034 (General requirements for the competence of reference material producers) to clarify concepts like metrological traceability and harmonize the document with the new ISO 33400 series. The joint working group expects to publish the revised ISO 17034 standard by January 2028.

11.5. Cooperation on International Traceability in Analytical Chemistry [CITAC]

[[CCQM/2026-14](#)] [[CCQM/2026-64](#)] Dr Mester presented the 2026 CITAC Best Paper Awards, which recognize outstanding publications in the field of Metrology in Chemistry. The three winning papers for 2025 were: "Stable Isotope Reference Materials and Scale Definitions - Outcomes of the 2024 IAEA Experts Meeting" (Camin et al.); "Activity Coefficients of HCl in Solutions Related to "Tris" Buffers in Artificial Seawater. III. Tris Buffer + NaCl + H₂O, from 0.2 to 3.25 mol kg⁻¹ Ionic Strength and from 5 to 45 °C" (Bastkowski, Sander, and Clegg); and "On the role of probability in science, analytical measurement and QUAM" (Willink). Dr Mester noted that since the award's inception in 2007, CITAC has recognized 49 papers and 329 awardees across more than 30 countries. He concluded by announcing that live presentations by the awardees will be held via Zoom and YouTube on 18 April 2026 and reminded CCQM that the nomination deadline for the next cycle is 31 December 2026.

12. CCQM Meetings

12.1. CCQM WG meetings to be held in 2026

NAWG, CAWG, and PAWG will hold meetings 19-22 October 2026 at NIMT. GAWG will hold a meeting 19-21 October at LACOMET. IAWG will hold a meeting 3-5 November 2026 at PTB. OAWG in October 2026 at LGC. SAWG, EAWG, and IRWG will hold online meetings.

12.2. Dates for CCQM meetings in 2027 and 2028

The next CCQM meetings at the BIPM headquarters are planned for 12-16 April 2027 based on additional room availability at FEI in Sèvres. The dates for the 2028 are not yet determined.

12.3. Farewell to Dr Park

Dr Wielgosz reviewed Dr Park's scientific career and long history with the CCQM. He praised Dr Park's impressive career trajectory and highlighted his effective leadership during the COVID-19 pandemic, a period when the CCQM successfully launched its Task Group system and increased its focus on vital stakeholder engagement. Following a standing ovation and the presentation of a memento, Dr Park expressed his deep gratitude, humbly accepting the recognition on behalf of all departing CCQM colleagues. He voiced strong confidence in the committee's future under the incoming leadership and BIPM Director, Dr Koo.

13. Closing remarks from the CCQM President

Dr Park thanked the BIPM staff, leadership, and attendees for a highly successful meeting before officially closing the plenary session.



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