CCQM KCWG Report to CCQM

April 2026

Review of Chemistry and Biology CMCs during Cycle XXVI (2025)

During the Cycle XXVI (2025) review of the Chemistry and Biology CMCs, 720 new/revised CMC claims were received from the RMOs. The breakdown of the CMC submissions in terms of CCQM Service Categories, CMCs submitted by RMO and how the CMCs are applicable to the work of the different technical working groups (WGs) of the CCQM is presented in **Tables 1** to **3**.

Table 1: No. of new and revised Chemistry and Biology CMCs in Cycle XXVI (2025)

2025	New
1. High purity chemicals	8
2. Inorganic solutions	8(+6)
3. Organic solutions	24
4. Gases	303(+19)
5. Water	162(+6)
6. pH	7(+1)
7. Electrolytic conductivity	7(+1)
8. Metal and metal alloys	2
9. Advanced materials	7
10. Biological fluids and materials	32(+2)
11. Food	130(+6)
12. Fuel	0
13. Sediments, soils, ores, and particulates	0
14. Other materials	10
15. Surfaces, films, and engineered nanomaterials	0
Sum	720

Table 2: No. of submitted Chemistry and Biology CMCs by RMO in Cycle XXVI (2025)

2025	New	Revised	Re-instated	Submitted during previous cycle	Total
AFRIMETS	22	64	0	0	86
APMP	87	147	0	0	234
COOMET	35	73	0	5	108
EURAMET	79	101	0	0	180
GULFMET	0	0	0	0	0
SIM	49	63(+41)	0	37	112
Sum	272	448(+41)	0	42	720

Table 3: No. of submitted Chemistry and Biology CMCs by RMO and WG in Cycle XXVI (2025)

WORKING GROUP	AFRIMETS	APMP	COOMET	EURAMET	GULFMET	SIM	Total
CAWG	0	0	0	0	0	0	0
EAWG	0	3	1	5	0	13(+2)	22
EAWG/IAWG	0	0	0	0	0	0	0
GAWG	63	69	70	100	0	1(+19)	303
IAWG	20	86	17	47	0	89(+18)	259
IRWG	0	6	0	0	0	0	6
NAWG	0	6	4	1	0	0	11
OAWG	3	64	16	27	0	8(+2)	118
PAWG	0	0	0	0	0	1	1
SAWG	0	0	0	0	0	0	0
Sum	86	234	108(+5)	180	0	112(+41)	720

The geopolitical situation that developed in Europe in 2023 has not changed. EURAMET members informed the KCWG again that they will not participate in the review of CMCs from Russia and Belarus during the review cycle XXVI (2025). This decision affected 70 CMCs under JCRB review submitted by COOMET. The CCQM KCWG guidelines require that 3 RMOs/reviewers actively participate in the JCRB review process for each submitted CMC. With the support of the RMO TC Chairs from SIM and EURAMET, additional experts for the

review of the COOMET CMCs were identified. Therefore, the JCRB review process for Chem-Bio CMCs was not seriously impacted also for the CMCs submitted by COOMET.

Once again, the review Cycle XXVI (2025) showed a significant reduction in the time to complete the JCRB review of CMCs by using KCDB 2.0. The issue of the “premature approval” of CMCs because RMO TC Chairs accepted the CMCs during the JCRB review process when the appointed KCWG WG representatives in the specific RMO did not complete the review of his/her assigned CMCs yet was handled better by the RMO TC Chairs during Cycle XXVI. During this review cycle the RMO TC Chairs also handled the acceptance of the CMC to be reviewed much better and remembered to raise their hand for the JCRB review of CMCs within the 3-week window.

The growth of chemistry and biology CMCs seems to have slowed down in recent years to a constant rate of about 400 to 700 CMCs per year from 2021. Some NMIs/DIs deleted several CMCs, and some of these deleted CMCs were replaced by a few broader scope claims. However, many other NMIs/DIs continue to show a steady increase in the number of CMC submissions. This points to the fact that the future growth rate of Chemistry and Biology CMCs is still determined by the national preference and decisions of individual members.

Update on the review of Chemistry and Biology CMCs during Cycle XXVII (2026)

During the Cycle XXVII (2026) review of the Chemistry Biology CMCs, 311 new/revised CMC claims were received from the RMOs. Also, some CMCs from previous review cycles are still in process in the KCDB in 2026. Notably, 27 CMCs from AFRIMETS and 2 CMCs from APMP at the status JCRB: Revision requested. Additionally, 16 CMCs from SIM at the status JCRB: Revision completed from 2025, 1 CMC from SIM at the status of JCRB: Revision completed from 2024, 2 CMCs from SIM at the status JCRB: Revision completed from 2023. These CMCs from SIM has since been actioned on and the CMCs from 2023 and 2024 have now been submitted for the JCRB vote. The breakdown of the CMC submission in terms of CCQM Service Categories, CMCs submitted by RMO and how the CMCs are applicable to the work of the different technical working groups (WGs) of the CCQM is presented in **Tables 4** to **6**.

Table 4a: No. of new and revised Chemistry and Biology CMCs in Cycle XXVII (2026)

(30 March 2026)	New
1. High purity chemicals	18
2. Inorganic solutions	15
3. Organic solutions	10
4. Gases	122
5. Water	44
6. pH	7
7. Electrolytic conductivity	9
8. Metal and metal alloys	2
9. Advanced materials	2
10. Biological fluids and materials	2
11. Food	54
12. Fuel	2
13. Sediments, soils, ores, and particulates	18
14. Other materials	5
15. Surfaces, films, and engineered nanomaterials	1
Sum	311

Table 4b: No. of 'not yet approved' CMCs submitted before Cycle XXVII (2026)

(30 March 2026)	Number
16. High purity chemicals	0
17. Inorganic solutions	2
18. Organic solutions	0
19. Gases	27
20. Water	11
21. pH	1
22. Electrolytic conductivity	0
23. Biological fluids and materials	2
24. Food	5
Sum	48

Table 5: No. of submitted Chemistry and Biology CMCs by RMO in Cycle XXVII (2026)

2026	New	Revised	Re-instated	*Total*
AFRIMETS	5	2	0	7
APMP	49	1	(4)	50
COOMET	17	20	0	37
EURAMET	102	46	3	151
GULFMET	0	0	0	0
SIM	66	0	0	66
Sum	239	69	7	311

Table 6: No. of submitted Chemistry and Biology CMCs by RMO and WG in Cycle XXVII (2026)

WORKING GROUP	AFRIMETS	APMP	COOMET	EURAMET	GULFMET	SIM	*Total*
CAWG	0	0	0	0	0	0	0
EAWG	0	1	5	10	0	6	22
EAWG/IAWG	0	0	0	3	0	0	3
GAWG	2	3	17	94	0	6	122
IAWG	2	24	7	27	0	50	110
IRWG	0	0	0	0	0	0	0
NAWG	0	0	0	3	0	0	3
OAWG	3	21	8	14	0	4	50
PAWG	0	0	0	0	0	0	0
SAWG	0	1	0	0	0	0	1
Sum	7	50	37	151	0	66	311

Re-review of existing CMC claims

The CMC re-review strategy of the CCQM KCWG previously looked at CMCs that were approved before 2010. There are still 122 CMCs in the KCDB that fall into this category. The remaining “old” CMCs are split between several service categories. When the CMCs approved

before 2015 are considered, there are 1492. The inorganic solutions and food categories had the most CMCs published before 2015. The schedule for the re-review of Chemistry and Biology CMCs has been adjusted to include all CMCs published during or before 2015 to remain within the timeframe of renewing the information in the KCDB over a ten-year cycle. The KCWG has tasked the WG representatives from GAWG, IAWG and OAWG to consider what new evidence will become available to support CMC claims in 2026. The plan will be to advise NMIs/DIs about the new evidence that will become available and what CMC claims will be impacted by the new evidence so that the responsibility will be returned to the NMIs/DIs to decide how they will manage their CMCs. The KCWG will also have further discussions on how to develop clear rules and guidelines in terms of the greying out of CMCs to manage the upkeep of valid CMCs in the KCDB.

At the KCWG meeting in April 2025, the WG representatives from the IAWG, GAWG and OAWG gave feedback on what evidence will become available during 2025 to support CMCs in 2026. The OAWG faces a high volume of “old” CMCs, particularly in the food and high purity categories. It was proposed to use an automated computational tool to screen CMCs for errors (like improper uncertainty conventions). The challenge was identified that if the KCWG changes its role to oversight where only recommendations are made to NMIs/DIs for the re-review of CMCs, there is currently no formal mechanism to “force” NMIs/DIs to update their CMCs. The GAWG operates on a 15-year “useful life” cycle for comparisons. Comparisons older than 15 years are proactively archived to prevent them from being used to support CMCs indefinitely. Based on the current core capability strategy of the IAWG, CMCs can be re-reviewed on a 7-year cycle by matching the service categories to the matrix measurement challenges as identified in the IAWG strategy.

Other mechanisms that were proposed to facilitate the update of the KCDB by the NMIs/DIs included a formal process to mark old comparisons in the KCDB as “archived” so that they could no longer be used to support new or existing CMC claims. There was also a discussion about the “greying out” of CMCs. The difficulty with this mechanism is that it is only the CMC writers (NMIs/DIs) that have the functionality to be able to “grey out” CMCs. The KCWG can only advise the institutes via the RMO TC Chairs about CMCs that are not supported by valid evidence in the KCBD anymore that have to be “greyed out” or deleted. The current proposal from the KCWG is to advise institutes about CMCs that need to be updated at the annual KCWG meeting and then follow up on whether appropriate action has been taken at the next KCWG meeting. Another possibility that was proposed for consideration was to add the functionality to the KCDB that is currently in the JCTLM database to formally challenge the validity of an existing CMC claim in the database.

Final issues that were raised included the emphasis on planning comparison schedules 10 to 20 years in advance, as is done by the GAWG and IAWG, so that NMIs/DIs know exactly which comparison they must participate in to maintain their CMC claims. It was also noted that the COVID-19 pandemic significantly delayed many "matrix studies" (particularly in the OAWG), creating a backlog that WGs are still working to clear.

CCQM Service categories

The discussions focused on the proposed expansion and structural overhaul of the CCQM service categories to include the new biological measurement services. The CAWG proposed adding Category 16 for “Cells and Biological Entities” and the NAWG proposed the addition of a new service category for Nucleic acid solutions with subcategories for DNA and RNA. There were also some proposals from the PAWG and OAWG for the addition of several subcategories to several of the main service categories.

The discussions also returned to the core debate whether the KCDB should be structured for internal administrative ease for the review of CMCs or should rather be user friendly for external customers. While NMIs use the KCDB for third party assessments, many end-users search NMI websites directly. The current structure of the KCDB including the service categories are not easily searchable by humans or even AI/LLMs (like ChatGPT).

The problem was also identified that the current categories are inconsistent with some main categories based on analytes and others on matrices, whereas the Gases-category is subdivided into applications. For the new biological measurement services, the CMCs are often categorised under the subcategory “Other”. Some of the CMC reviewers suggested to move toward a “tagging system” or a “matrix-first” structure with analyte subcategories to make the data more user-friendly and ultimately also machine-readable.

In conclusion, the WG representatives were encouraged to take the discussions on the service categories further within their technical working groups to determine the best way to restructure the service categories for use within the KCDB without the need for a major redesign of the database. There was general consensus that a full re-assessment of all the CCQM service categories is needed to ensure that they are “fit for purpose” in a digital age. Any proposals for new service categories must also be formally proposed and submitted to the CCQM plenary for approval.

Uncertainty conventions

During the KCWG meeting the two ways of presenting the uncertainty claims for CMCs (i.e. Uncertainty convention 1 and Uncertainty convention 2) were discussed again. Uncertainty convention 1 is typically used for narrow measurement ranges away from detection limits and represents the uncertainty claim as a range that covers the measurement range of the CMC. Uncertainty convention 2 is used for wider ranges near detection limits, where the relative uncertainty is higher at the low end of the CMC measurement range (see **Figure 1**).

Uncertainty convention 1

Quantity	Matrix	Analyte	CMC Unit	CMC Lower limit	CMC Upper limit	CMC Exp Unc Unit	CMC Exp Unc U min	CMC Exp Unc U max	CMC Exp Unc Coverage	CMC Exp Unc LOC%	Abs or Rel Unc
Mass fraction	drinking water	As	µg/kg	0.1	30.0	%	5.6	11.2	2.0	95.0	Relative

Uncertainty convention 2

Quantity	Matrix	Analyte	CMC Unit	CMC Lower limit	CMC Upper limit	CMC Exp Unc Unit	CMC Exp Unc U min	CMC Exp Unc U max	CMC Exp Unc Coverage	CMC Exp Unc LOC%	Abs or Rel Unc
Mass fraction	drinking water	As	µg/kg	0.1	30.0	%	11.2	5.6	2.0	95.0	Relative

Figure 1: Representation of the two uncertainty conventions used to express the uncertainty claims for ChemBIO CMCs

It was noted during the meeting that these conventions exist because institutes couldn't reach a consensus on how to present the uncertainties for CMC claims, in the days before the CIPM MRA, when the KCDB was still being developed. Currently, the usage split is roughly 50/50, though some data suggests a 65% preference for uncertainty convention 2. Several KCWG members argued that the two conventions confuse users and that no other international bodies (like JCTLM) use two uncertainty conventions. When CMCs are presented in the KCDB, to the users, it is also not stated which uncertainty convention was used to express the uncertainty claim. It was proposed to move towards using uncertainty convention 2 only, which is the uncertainty convention that is the easiest to represent in the KCDB, to simplify the database. Some KCWG members raised concerns that forcing a single uncertainty convention might lead to the "splitting" of CMCs into multiple CMC entries or might not work for specific fields like organic purity.

The outcome of the discussions at the KCWG meeting was to introduce the topic at the CCQM plenary meeting. WG representatives will also continue to gather feedback from their respective working groups before any formal changes are made to the KCDB.

Representation by the RMOs at the KCWG meeting

At the KCWG meeting there was a question from APMP about the possibility of increasing the number of representatives from the RMOs to be able to represent more of the technical working groups with the representation from each RMO. This question was also raised by APMP during the KCWG meeting in 2024. The counter argument is that the other less

developed RMOs may have difficulty in filling their quota of representatives and the meeting might become difficult to administer effectively. A proposal was made to ask EURAMET and APMP to give a presentation to explain how they conduct their intra-RMO review of CMCs to see if the knowledge exchange could facilitate improvements to the intra-RMO CMC review process.

EURAMET explained that it uses a "top-down" structure with a TC Chair and four Vice Chairs specialised in specific scientific areas (Bio/Organic, Inorganic, Gas, and Electrochemistry). Their cycle is strictly timed from December to September, with most coordination handled via e-mail and a key face-to-face meeting of the EURAMET TC-MC in February every year. APMP focuses on harmonisation and pooling expertise. They use a mix of KCWG members and invited experts for the intra-RMO review. They have faced challenges with reviewer availability and are concerned about maintaining uniform standards as the number of "re-reviews" increases within the KCDB 2.0.

The difference between EURAMET's structured delegation and APMP's collective approach was noted, and it was suggested that "knowledge transfer" is essential to ensure reviewers from different regions evaluate CMCs consistently. APMP reported a high rejection rate (90% of CMCs fail the initial review), indicating that CMC writers often do not understand the required quality standards or what documentation to include for the support of their CMCs. The group acknowledged that the KCWG has shifted from a technical "spreadsheet-checking" group to a strategic body. This triggered a proposal to reassess the KCWG's Terms of Reference and membership structure.

To address the high failure rate and harmonise reviews, a KCWG Task Group was formed to develop e-learning modules for CMC writers and reviewers. These will focus on technical case studies rather than just the administrative "mechanism" of the CMC review process within the KCDB. Mark Lewin from NMIA, Australia, the WG representative from the OAWG, volunteered to lead this task group, with the support from KCWG WG representatives, who will provide the necessary case studies. There was also a suggestion to allow intra-RMO reviewers to observe JCRB reviews to "onboard" them as future experts, similar to how accreditation bodies train assessors.

KCWG membership

The current KCWG membership that will be responsible for the Cycle XXVII (2026) review of Chemistry and Biology CMCs has been confirmed by the RMO TC Chairs and is presented in **Table 7**.

Table 7: Confirmed membership of the KCWG for Cycle XXVII (2026)

Name	Representation
Angelique Botha	KCWG Chair
Alvin Fung	KCWG Vice Chair
John Molloy	KCWG Rapporteur
Robert Wielgosz	BIPM
Stéphanie Maniguet	BIPM
APMP	
Tang Lin TEO Jin-Sang Jung Xiuqin LI Kazumi Inagaki Kyoung Seok Lee	TCQM Chair
EURAMET	
Teemu Näykki Béatrice Lalere Bernhard Niederhauser Steffen Seitz Heidi Goenaga-Infante	TCMC Chair
AFRIMETS	
Angelique Botha Hanen Klich Ibrahim Tahoun Randa Nasr Ahmed Yamani Caleb Luvonga	TCQM Chair
COOMET	
Yury Kustikov Olga Efremova Narine Oganyan Alena Sobina Yury Kopyltsov (RF, VNIIM)	TCQM Chair
SIM	
Bryan Calderón José Luis Ortiz Aparicio Bruno C Garrido Patricia Grinberg Andreia A Lima	TCQM Chair
GULFMET	
Abulrahman R AlAskar	
KCWG WG representatives	
Carla Divieto	CAWG
Alena Sobina	EAWG
Christina Cecelski	GAWG
Maré Linsky	IAWG
Philip Dunn	IRWG
Liana Dong	NAWG

Mark Lewin	OAWG
Liqing WU	PAWG
Alex Shard	SAWG
Rainer Stosch	SAWG

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Angelique Botha

CCQM KCWG Chair

Alvin Wai-hong FUNG

CCQM KCWG Vice-Chair