

KCDB REPORT TO THE JCRB

March to September 2020

Executive Summary

The new version of KCDB – KCDB 2.0 – is on-line since the 29 October 2019, providing search facilities of CMCs and comparisons, a user platform supporting intra- and intra-RMO reviews, a frame for comparison registration and publication, and a tool for user-generated statistics.

The previous delay in CMC and comparison publication, a consequence of the transition from the former to the new software support, has been largely absorbed¹.

The CMCs published since the implementation of KCDB 2.0 are presently provided via two different paths:

- i) CMCs approved on the former JCRB support and imported by the KCDB Office;
- ii) CMCs drafted, reviewed, approved and published on the KCDB web platform.

The implementation of the KCDB 2.0 has been accompanied by making available a variety of guidance material and demonstrations to users within the frame of the CBKT.

Introduction

This report summarizes the major progress and evolution of the BIPM Key Comparison Database (KCDB) over the last six months.

A new version of the KCDB - KCDB 2.0 - was implemented on 29 October 2019. The platform is progressively being used for CMC submissions, and is now used on a daily basis for comparisons.

The status of the database concerning **Calibration and Measurement Capabilities** are given in Section 1. In Section 2, recent information concerning **comparisons** carried out within the frame of the CIPM MRA is summarized. Section 3 highlights the status of **Associates** of the BIPM, and a short view on the status of **the KCDB 2.0** is presented in Section 4.

This report reflects the status as of 26 August 2020.

1. CIPM MRA Appendix C : Calibration and Measurement Capabilities

1.1. CMC status

The new database became accessible in October 2019. A large number of CMCs that previously had been posted on the JCRB web were approved during the time the database was inaccessible when installing software and carrying out the data migration¹.

¹ 35 batches were published, 7 batches remains of which 4 are object for feedback from the submitting institutes.

The previous delay in the publication of CMC data when launching the KCDB 2.0 has been largely absorbed. The CMCs that presently get published on the KCDB have two sources:

- i) CMCs approved on the former JCRB support and imported by the KCDB Office;
- ii) CMCs drafted, reviewed, approved and published on the KCDB web platform.

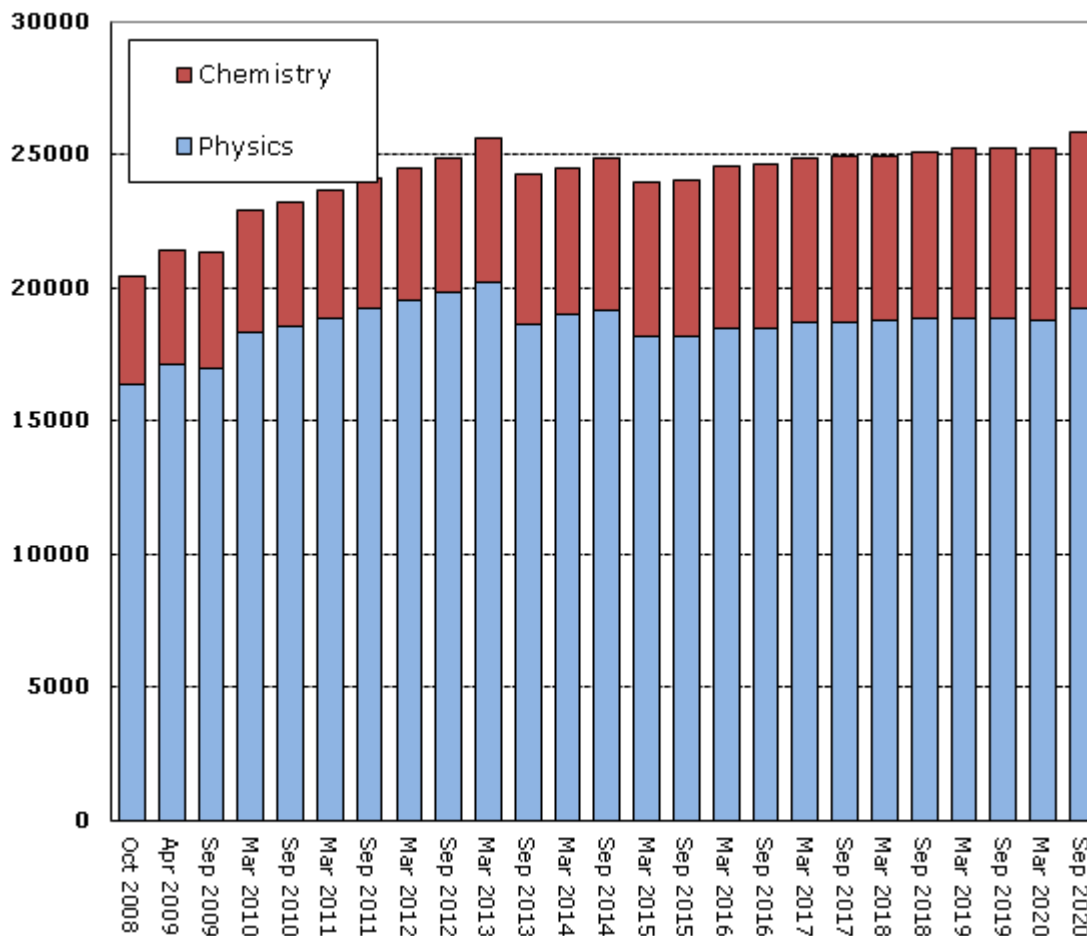


Figure 1. Number of CMCs registered in the KCDB since October 2008.

The CMC batches that remain to be published on 26 August 2020 are listed in Appendix I.

There are presently² 25 801 (25 202) CMCs published in the KCDB end of August 2020 of which 19 238 (18 792) are in Physics and 6 563 (6 410) in Chemistry and Biology. The total number of published CMCs have increased by 2.2 % over a one-year period.

The repartition of CMCs is available in real-time from the KCDB home page in “CMC statistics” <https://www.bipm.org/kcdb/cmc/statistics/public> . The Excel files previously used as a basis for the CMC statistics are still available on the [access-restricted JCRB CMC website](#) (on “KCDB statistics”).

The status of not yet published CMCs is listed in Table 1-a. 872 (383) CMCs are presently in an “intermediate” state.

Table 1-a Status of not yet published CMCs in KCDB on 26 August 2020.

Status	number of CMCs
Draft	74
RMO: Submitted	118
RMO: Under Review	21
RMO: Review Completed	22
RMO: Revision Requested	8
JCRB: Under Review	104
JCRB: Revision Requested	34
JCRB: Revision Completed	9
JCRB: Waiting for VOTE	2
Greyed out	475
Submitted to the KCDB	5
TOTAL	872

The distribution of published CMCs along the RMOs is listed in Table 1-b.

² The numbers given within parenthesis represents the number of CMC reported in end of February 2020.

Table 1-b Number of published CMCs in KCDB per RMO on 26 August 2020 (follow-up of Action 17/1 of JCRB 2006).

Metrology area	Published CMCs
AFRIMETS	620
APMP	6409
COOMET	2654
EURAMET	11383
GULFMET	0
SIM	4735
TOTAL	25801

1.2. CMC evolution

The total number of published CMCs during the last 6 months for each metrology area is listed in Table 1-c. These numbers include revised CMCs and upload of greyed out CMCs (460), not necessarily needing an intra-RMO review.

The first CMCs for Mongolia were published on 15 July 2020 in Mass and related quantities. Those were submitted via the APMP.

35 CMC batches, approved on the JCRB web site, were published by the KCDB Office via importation. These are listed in Table 1-d.

Table 1-c Number of published CMCs per metrology area on 26 August 2020 since 27 February 2020.

Metrology area	number of CMCs
AUV	179
EM	134
L	751
M	148
PR	168
T	497
TF	26
QM	750
RI	371
TOTAL	3 024

Table 1-d CMC batches published during the last 6 months. The 2-digit ISO code for the represented countries is indicated in the right column.

Batch	Country
APMP.T.16.2019	CN, HK, MA, TH
COOMET.EM.14.2019	UA
EURAMET.L.20.2019	BE, CH, DE, ES, FR, UK
COOMET.M.33.2019	RU
EURAMET.M.65.2019	BA, DK, ME, MK, PT, SI, SE
APMP.L.29.2019	ID
COOMET.PR.14.2019	RU
COOMET.L.16.2019	GE
SIM.M.42.2019	CO
APMP.PR.10.2018	CN, HK, MA, TH
<i>(continued)</i>	
Batch	Country
SIM.M.44.2019	US
EURAMET.QM.34.2019	BG, CH, DE, FR, GR, HU, NL, PL, TR, UK
SIM.EM.11.2019	AR
SIM.M.41.2019	CR, UY
APMP.QM.31.2019	AU, CN, HK, JP, KR, SG, TH
COOMET.QM.29.2019	UA, RU
SIM.QM.25.2019	AR, BO, BR, CA, CO, CR, MX, PE, US, UY
EURAMET.RI.33.2019	NL
EURAMET.RI.31.2019	RS
EURAMET.AUV.21.2019	PL
EURAMET.AUV.20.2019	FR
SIM.RI.20.2019	BR
EURAMET.PR.17.2019	CH, CZ, FI, FR, TR
APMP.M.49.2019	JP
EURAMET.T.25.2019	CZ, DE, IT, NO, SI, TR
COOMET.L.18.2019	KZ, RU
SIM.AUV.4.2019	BR
COOMET.EM.16.2019	BY, GE, MD, RU
COOMET.T.13.2019	AZ, BY, GE, KZ, MD, UK
APMP.M.50.2019	SG, TH
APMP.QM.32.2019	AU
EURAMET.QM.35.2019	NL, UK
COOMET.QM.30.2019	RU
COOMET.PR.13.2019	UK
AMP.M.51.2019	MN

1.3. Greyed out CMCs and reinstatements

The greyed out CMCs that previously were not included in the database were added to the KCDB 2.0 and may be consulted via the Statistic tool after logging in.

There are presently 475 greyed out CMCs. The most recent events on greyed out CMCs from end of February 2020 are listed in Table 1-e. Table 1-f displays all greyed out CMCs where the most recent events are highlighted in yellow.

Table 1-e *Evolution of greyed out CMCs from 27 February to 26 August 2020.*

RMO	Country	Area	Action	Date	CMCs
AFRIMETS	South Africa	RI	grey out	2020-08-06	-11
APMP	New Zealand	TF	grey out	2020-04-29	-2
EURAMET	Bulgaria	QM	grey out	2020-07-13	-5
EURAMET	Finland	L	grey out	2020-04-02	-1
EURAMET	France	QM	grey out	2020-07-21	-1
EURAMET	Montenegro	L	reinstated	2020-03-06	+1
EURAMET	Slovenia	QM	reinstated	2020-03-04	+2

Table 1-f *Status of greyed out CMCs on 26 August 2020.*

RMO	Country	AUV	M	PR	EM	T	RI	L	QM	TF	Total
AFRIMETS	ZA		4				11				15
APMP	CN							1			1
APMP	IN							3			3
APMP	JP							3			3
APMP	KR								6		6
APMP	NZ				1					2	3
APMP	TH						3	1			4
EURAMET	BG								5		5
EURAMET	DE						3		12		15
EURAMET	ES						2				2
EURAMET	FI							1			1
EURAMET	FR								1		1
EURAMET	IT		31		19		98	1	3		152
EURAMET	JRC						110		82		192
EURAMET	LT		5								5
EURAMET	LV				30						30
EURAMET	ME								0		0
EURAMET	PT						1	1			2
EURAMET	SE				2						2
EURAMET	SI								0		0
EURAMET	SK	6						2			8
SIM	MX								1		1
SIM	US		3		8						11
SIM	BR		3						10		13

TOTAL: 475

1.4. Format of uncertainty equations

A request from CCL, supported by CCM, to use replace the numerical equation format (presently applied in the KCDB) by quantity equations, was approved by CIPM members at the Consultative Committee President's meeting in June 2018.

The transition to this new format requests a revision of the uncertainty equations. The JCRB Executive Secretary and the KCDB Office developed instructions how to carry out such revision.

The TC-L of EURAMET made the revision May/July and the revised CMCs were successfully uploaded by the KCDB Office in July.

2. CIPM MRA Appendix B : Key and supplementary comparisons

2.1. Comparison status and evolvement

On the 26 August 2020 the KCDB covered 1672 (1648) comparisons online distributed as listed in Table 2; 1060 of these are key comparisons and 612 supplementary comparisons. This represent a total increase of 24 comparisons, all registered by the pilots using the KCDB web platform.

Table 2 Key and Supplementary Comparisons on 26 August 2020.

Entity	KC	SC
BIPM	100	1
CC	512	34
AFRIMETS	7	26
APMP	142	117
COOMET	48	110
EURAMET	175	198
GULFMET ³	4	20
SIM	72	106
TOTAL	1060	612

Figure 2 shows the evolution of the total number of key (dark blue) and of supplementary (peach) comparisons registered in the KCDB since September 2003. The annual increase of key comparisons seems to have stabilized to around some +40 taking into account the history since 2004. The annual increase of key- and supplementary comparisons is around 6 %. The ratio of supplementary comparisons, 20 % in 2006, keeps progressing and constitutes 37 % of all comparisons. The graph include repeats of key comparisons.

³ The GULFMET was approved as an RMO on a provisional basis by the CIPM in October 2015.

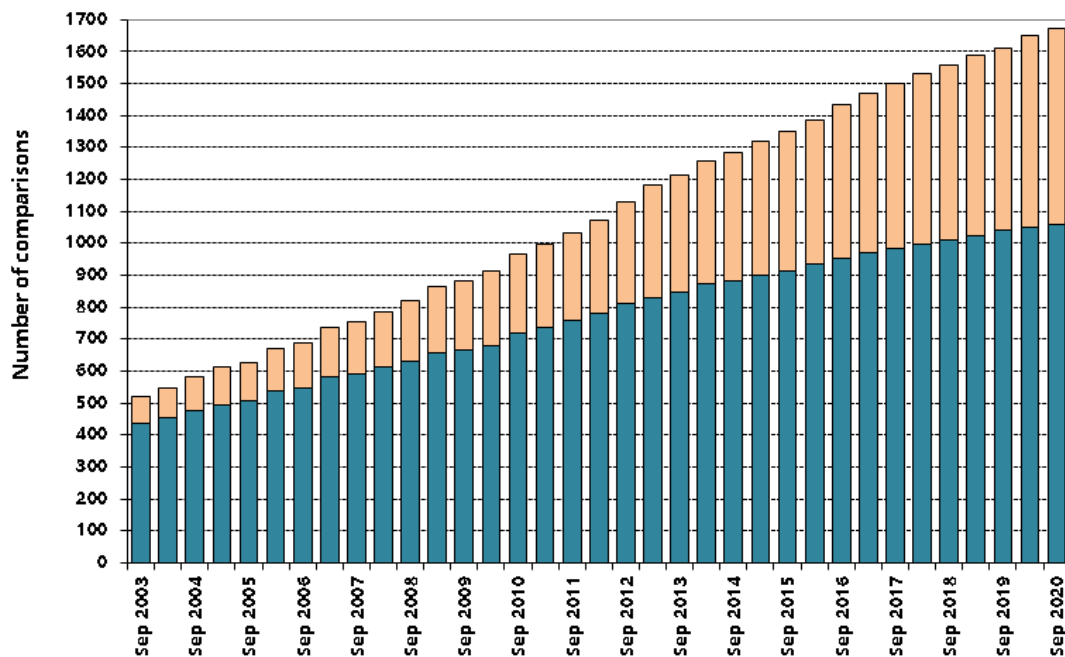


Figure 2. Total number of key comparisons (dark blue) and supplementary comparisons (peach) registered in the KCDB: evolution since September 2003

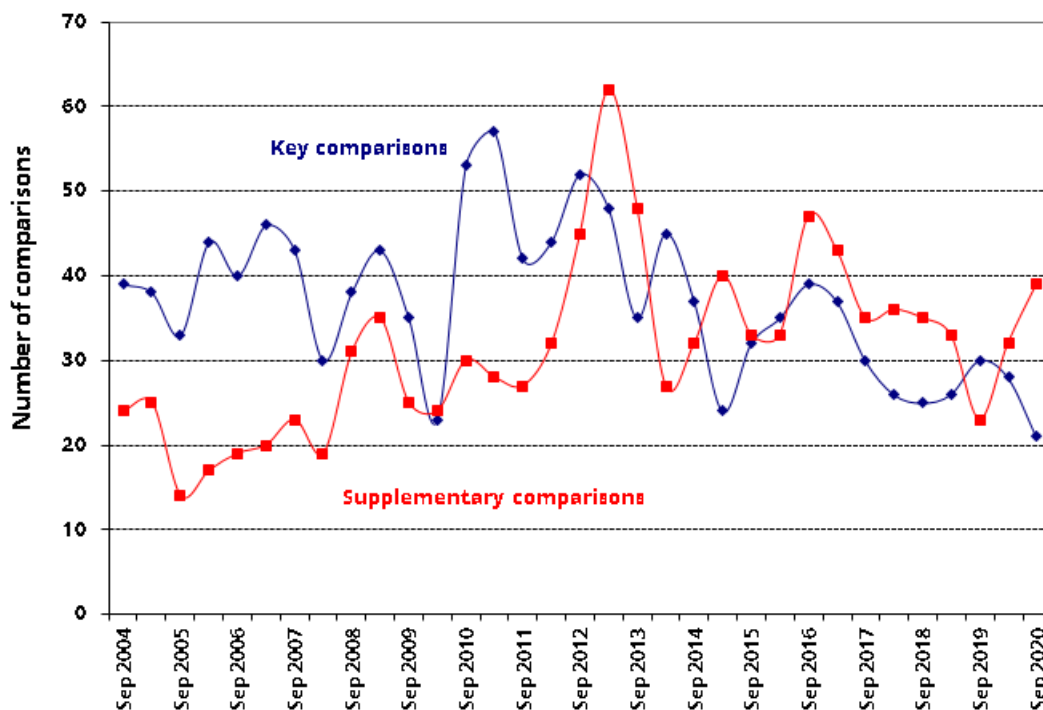


Figure 3. Number of new comparisons registered in the KCDB over the one-year period ending at the date indicated on the abscissa.

The number of new key and supplementary comparisons registered in the KCDB over the one-year period ending at the date indicated on the the abscissa is illustrated in Figure 3.

Graphs generated in real-time illustrating the participation in key and supplementary comparisons are available under the Statistics menu on the KCDB home page:

<https://www.bipm.org/kcdb/comparison/statistics/key>

<https://www.bipm.org/kcdb/comparison/statistics/supplementary>.

The following 25 comparisons were registered as new during the last 6 months:

AFRIMETS.L-K1.2020	COOMET.L-S23	COOMET.T-S4
AFRIMETS.L-K3.2020	COOMET.L-S24	EURAMET.EM-K11.1
APMP.AUV.A-K5	COOMET.L-S25	EURAMET.EM-S44
APMP.QM-K18.2016	COOMET.L-S26	EURAMET.EM-S45
APMP.QM-S19	COOMET.L-S27	EURAMET.L-K8.2020
CCQM-K146	COOMET.L-S28	EURAMET.M.D-K4.2020
CCQM-K146.1	COOMET.L-S29	SIM.M.FF-S13
CCQM-K154.a.1	COOMET.L-S30	SIM.M.F-S10
CCRI(II)-K2.Cd-109.2021		

The following 56 reports were published during the last 6 months:

AFRIMETS.M.FF-K4.2.2015	BIPM.RI(I)-K7 (NIM)	EURAMET.AUV.V-K2
APMP.M.H-K1.b	BIPM.RI(I)-K7 (NRC)	EURAMET.EM-S40
APMP.M.H-K1.c	BIPM.RI(I)-K9 (LNE-LNHB)	EURAMET.L-K5.2016
APMP.M.P-K9	BIPM.RI(II)-Ho-166m (NMISA)	EURAMET.M.FF-K4.1.2016
APMP.M.P-S9	BIPM.RI(II)-K1.Ge-68	EURAMET.M.G-K3
APMP.QM-S12	BIPM.RI(II)-Mn-54 (PTB)	EURAMET.M.H-S1.a.b.c
APMP.RI(I)-S3	CCQM-K112	EURAMET.M.M-K4.2015
BIPM.EM-K12 (KRISS)	CCQM-K115.b	EURAMET.M.P-K1.c
BIPM.EM-K12 (NIM)	CCQM-K122	EURAMET.M.P-S13
BIPM.EM-K12 (NMIJ AIST)	CCQM-K145	EURAMET.RI(I)-K1.1
BIPM.EM-K13.a and b (NMC, A*STAR)	CCRI(II)-K2.Rn-222	EURAMET.RI(I)-K4.1
BIPM.QM-K1(EAA)	CCRI(II)-S14.Rn-222	EURAMET.T-S3
BIPM.QM-K1(JRC)	CCTF-K0001.UTC	GULFMET.EM.BIPM-K11
BIPM.QM-K1(NILU)	CCT-K9.1	GULFMET.M.M-K7
BIPM.QM-K1(NIST)	CCT-S2	GULFMET.M.P-S1
BIPM.QM-K1(NMC, A*STAR)	COOMET.M.FF-S2	SIM.AUV.A-S2
BIPM.QM-K1(UBA)	COOMET.M.F-S8	SIM.EM-S8
BIPM.RI(I)-K3 (LNE-LNHB)	COOMET.PR-K3.a	SIM.M.P-S10
	COOMET.T-S3	SIM.M.T-S2

End of August 2020, 69 abandoned or superseded key and supplementary comparisons were kept in the KCDB archives (included in the presented statistics).

2.2. Comparisons older than 5 years (Follow-up Action 33/3 of JCRB 2015)

Action 33/3: *The BIPM KCDB office, as part of the KCDB report to the JCRB, to identify Key and Supplementary Comparisons which were started 5 or more years ago and have not reached a conclusion.*

The number of unfinished comparison older than 5 years shows a slight decrease from previous years. The total number is illustrated in Figure 4. A list of the comparisons concerned may be found in Appendix II.

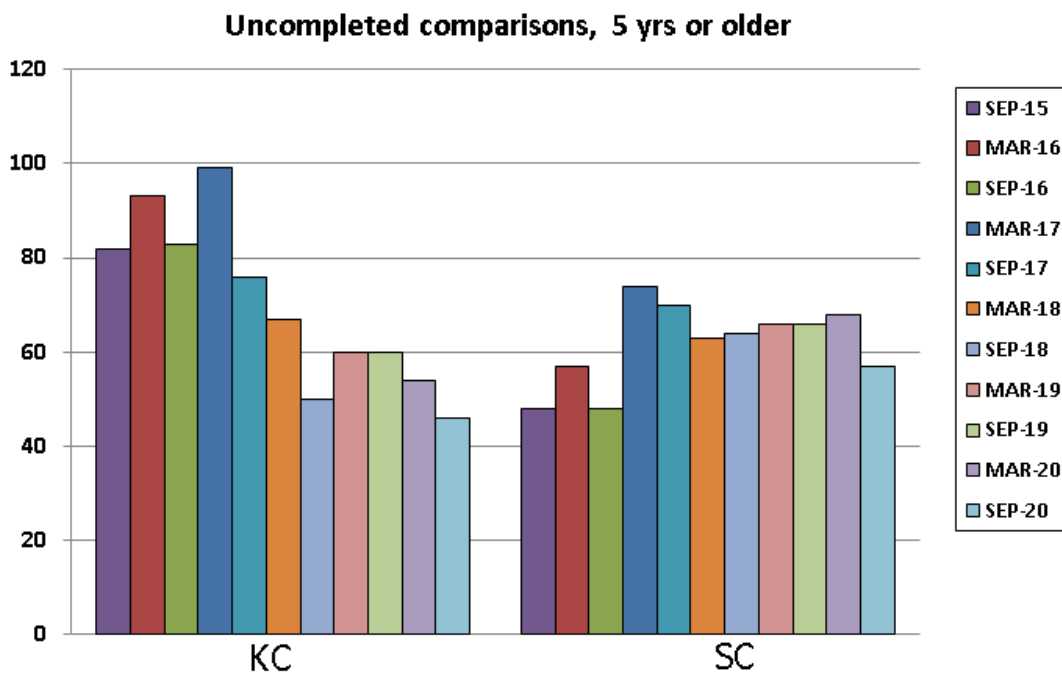


Figure 4. Histogram showing the number of incomplete comparisons that started more than 5 years ago.

3. Participation of Associates of the CGPM in CIPM MRA activities

Table 3 summarizes the participation of the 40 Associates of the CGPM in CIPM MRA activities as at 26 August 2020. In particular, Mongolia submitted their first CMCs and Azerbaijan increased their number of CMCs during the last 6 months.

Table 3. CIPM MRA activity of the NMIs of Associates of the CGPM: number of published CMCs and participation in key and supplementary comparisons. ⁴

Country	Published CMCs	Greyed out CMCs	Key Comparisons	Supplementary Comparisons
Albania	7	0	8	4
Azerbaijan	25	0	1	8
Bangladesh	0	0	2	2
Bolivia	21	0	9	22
Bosnia and Herzegovina	72	0	13	13
Botswana	3	0	1	5
CARICOM (Caribbean Community)	0	0	0	9
Chinese Taipei	390	0	100	48
Costa Rica	67	0	19	31
Cuba	113	0	6	21
Estonia	34	0	9	12
Ethiopia	0	0	0	3
Georgia	59	0	6	17
Ghana	0	0	2	7
Hong Kong, China	281	0	95	28
Jamaica	22	0	6	11
Kuwait	0	0	2	2
Latvia	29	30	13	9
Luxembourg	0	0	4	1
Malta	0	0	4	3
Mauritius	0	0	2	3
Moldova, Republic of	76	0	4	16
Mongolia	16	0	4	4
Namibia	7	0	0	3
North Macedonia	21	0	9	11
Oman	0	0	0	2
Panama	37	0	8	21
Paraguay	8	0	2	18
Peru	105	0	31	34
Philippines	31	0	13	9
Qatar	0	0	2	1
Seychelles	0	0	0	3
Sri Lanka	0	0	8	2
Sudan	0	0	0	1
Syrian Arab Republic	0	0	12	3
Tanzania	0	0	0	1
Uzbekistan	0	0	0	2
Viet Nam	31	0	36	9
Zambia	11	0	2	8
Zimbabwe	19	0	1	8
TOTAL	1466	30	433	407

⁴ These numbers take into account all comparisons registered in the KCDB, disregarding status, for which at least one laboratory of the Associate is listed in the participants list.

The repartition of CMCs and comparisons among Associates is illustrated in Figures 5 and 6.

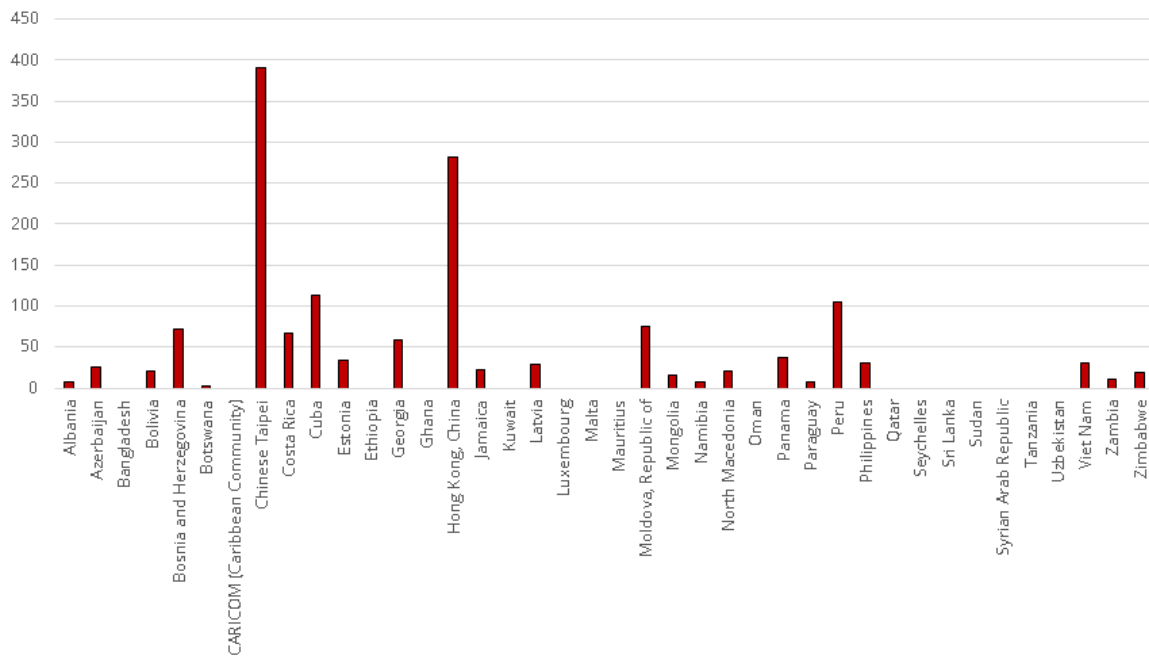


Figure 5. Graph on the number of CMCs declared by Associates of the CGPM

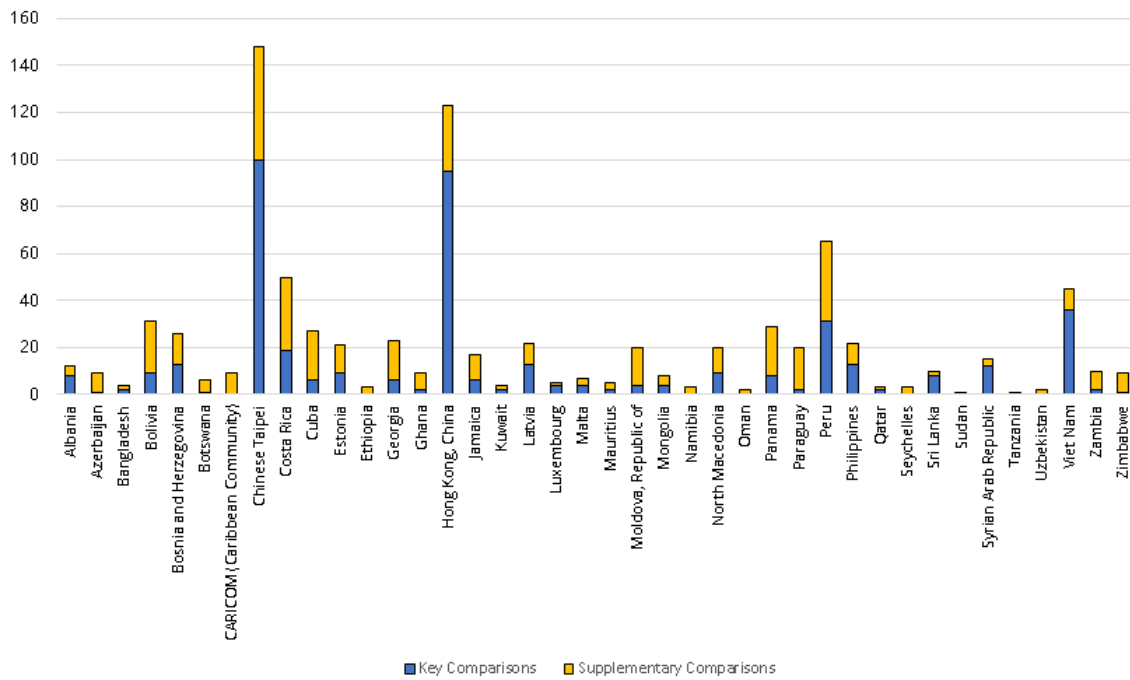


Figure 6. Graph on the participation of Associates of the CGPM in key and supplementary comparisons

4. Status of the BIPM KCDB 2.0

- The KCDB 2.0 was implemented on 29 October 2019, and the KCDB web platform was successively made available to the different metrology areas.
- The implementation has been accompanied by providing a variety of guidance material, cf. <https://www.bipm.org/en/about-us/kcdb-help.html>, and demonstrations to users within the frame of the CBKT <https://www.bipm.org/en/cbkt/>, see also Appendix III.
- A statistical tool was added in January 2020.
- The KCDB 2.0 software is supported by an Application Management contract. Revealed anomalies are corrected; the software has been updated at a number of occasions since start. Anomalies and suggestions for improvements may be communicated by the users by completing the form https://www.bipm.org/utis/common/pdf/KCDB_2.0/Form_for_declaring_an_anomaly_or_request.docx.
- The first CMC that has been drafted and approved on the KCDB web platform was published on 2 April 2020 - there are now 118 such CMCs. The average duration of the JCRB review of 1 CMC is 76 days.
- The first comparison results were published on the platform 27 November 2019. Comparison pilots are now using the platform, and the workflow seems fluid.

4.1. Quality System

The Quality System underpinning the previous version of the KCDB is obsolete.

A main quality procedure was drafted and the KCDB Office underwent an internal audit in November 2019. The issued instructions on the KCDB 2.0 (cf. section 4.1) are incorporated in the Quality System for the KCDB.

The main procedure has now being replenished by technical instructions, in particular those covering back office procedures realized by the KCDB Office. An new internal audit is planned for September 2020.

Acknowledgement

Many thanks to the BIPM IT team Laurent Le Mée and Thierry Nguyen for their prompt actions and solid support. We acknowledge also the collaboration with Sten Bergstrand (JCRB Executive Secretary), Chingis Kuanbayev and Robert Sitton (both BIPM).

APPENDIX I Approved CMC batches not yet published on 26 August 2020

Approval date	Batch	
22/04/2020	APMP.L.30.2019	(a)
17/05/2020	SIM.QM.26.2019	(b)
08/07/2020	APMP.EM.11.2019	(a)
08/07/2020	AFRIMETS.QM.17.2020	(a)
08/07/2020	APMP.QM.33.2020	
20/07/2020	COOMET.QM.31.2019	
29/07/2020	SIM.QM.27.2019	

(a) Problems on the batch resolved shortly before this report was drafted.

(b) Quality System proof missing when this report was drafted.

APPENDIX II List of uncompleted comparisons older than 5 years**a) Key Comparisons**

KC identifier	Indicated year	Status Sep-2020	Pilot
AFRIMETS.M.P-K2	2012 - 2013	Measurements in progress	NMISA
APMP.EM.BIPM-K11.2	2004	Report in progress, draft B	Puslit KIM-LIPI
APMP.EM.RF-K8.CL	2012 - 2013	Measurements completed	NMIJ AIST
APMP.EM-K12	2014 - 2015	Report in progress, Draft B	NMC, A*STAR
APMP.EM-K2	2010 - 2011	Measurements in progress	KRISS
APMP.EM-K5.1	2010 - 2013	Report in progress, draft A	NIM
APMP.M.D-K4	2007 - 2008	Report in progress, draft A	KRISS
APMP.M.F-K3.a	2011 - 2014	Measurements in progress	NIM
APMP.M.F-K3.b	2011 - 2014	Measurements in progress	NIM
APMP.M.P-K15	2013 - 2014	Measurements completed	NMIJ AIST
APMP.PR-K2.b	2014	Report in progress, Draft A	KRISS
APMP.PR-K3.a	2012 - 2014	Measurements in progress	NMIJ AIST
APMP.PR-K3.a.1	2006	Measurements completed	NIM
APMP.RI(I)-K4	2009 - 2010	Report in progress, draft A	INER
APMP.RI(I)-K5	2013 - 2014	Report in progress, draft A	KRISS
APMP.T-K3.6	2013 - 2014	Planned	NIM
APMP.T-K4.1	2013 - 2014	Planned	NIM
APMP.T-K6.2013	2013 - 2014	Planned	MSL
APMP.T-K8	2011 - 2013	Measurements in progress	MSL
CCEM.RF-K5.c.CL	2012 - 2015	Measurements in progress	NMIJ AIST
CCL-K1.2011	2011 - 2014	Measurements in progress	CENAM
CCM.FF-K2.2011	2013 - 2015	Report in progress, Draft B	VSL
CCPR-K3.2014	2014	Protocol complete	NRC
CCQM-K114	2014	Report in progress, draft B	NIM
CCQM-K117	2015	Planned	VSL
CCQM-K118	2015	Planned	VSL
CCRI(II)-K2.Tc-99	2012 - 2013	Measurements in progress	NPL
CCRI(III)-K9.AmBe.1	2012 - 2013	Report in progress, draft A	NPL
CCT-K1.1	2006 - 2014	Report in progress, draft A	NIST
CCT-K2.2	2014	Measurements in progress	INRIM
CCT-K4.1	2012 - 2014	Measurements in progress	NMIA
CCT-K6.1	2008 - 2010	Report in progress, draft A	MSL
CCT-K9	2011 - 2012	Measurements completed	NIST
COOMET.AUV.V-K1	2007 - 2008	Report in progress, draft B	VNIIM
COOMET.L-K3	2011 - 2012	Report in progress, draft A	VNIIM
COOMET.T-K3.3	2014 - 2015	Planned	VNIIM
EURAMET.L-K4.2005.1	2013 - 2014	Measurements in progress	VSL
EURAMET.T-K3.4	2010 - 2011	Report in progress, draft A	MIRS/UL-FE/LMK

(continued...)

KC identifier	Indicated year	Status Sep-2020	Pilot
EURAMET.T-K8	2008 - 2012	Report in progress, draft A	PTB
EUROMET.M.F-K1	2002 - 2004	Report in progress, draft B	MIKES
EUROMET.M.F-K3	2005 - 2008	Measurements in progress	PTB
SIM.M.P-K1	2008 - 2010	Protocol complete	CENAM
SIM.M.P-K6	2008 - 2011	Report in progress, draft A	CENAM
SIM.M.P-K6.1	2011 - 2013	Report in progress, draft B	LACOMET
SIM.M.P-K7	2001	Report in progress, draft B	CENAM
SIM.QM-K1	2009	Report in progress, draft B	INMETRO

b) Supplementary Comparisons

SC identifier	Indicated year	Status Sep-2020	Pilot
APMP.EM.RF-S5.CL	2013 - 2015	Protocol complete	NMIJ AIST
APMP.EM.RF-S6.CL	2015	Protocol complete	NMIJ AIST
APMP.EM-S8	2011 - 2013	Protocol complete	NPLI
APMP.L-S7	2014 - 2015	Report in progress, Draft B	NPLI
APMP.M.G-S1	2012	Report in progress, draft A	NIM
APMP.M.H-S4	2011	Report in progress, draft A	KRISS
APMP.M.MM-S1	2012 - 2013	Measurements in progress	KRISS
APMP.M.P-S1	2003 - 2005	Measurements completed	CMS/ITRI
APMP.M.P-S7	2015	Report in progress, draft B	NIMT
APMP.PR-S1.2	2008	Protocol complete	NMC, A*STAR
APMP.PR-S5	2008 - 2009	Measurements completed	NMIJ AIST
APMP.RI(I)-S1	2010 - 2011	Report in progress, draft B	OAP
APMP.RI(II)-S3.Cs-134.Cs-137	2013	Report in progress, draft B	NMIJ AIST
APMP.T-S10	2013	Planned	KRISS
APMP.T-S8	2011 - 2015	Measurements in progress	NMLPHIL
APMP.T-S9	2013	Planned	NMIJ AIST
CCRI(II)-S10	2011 - 2012	Report in progress, draft A	ENEAN-INMRI
CCRI(II)-S9	2011	Report in progress, draft A	KRISS
CCT-S3	2007 - 2008	Report in progress, draft A	NMIJ AIST
COOMET.EM-S10	2010 - 2012	Report in progress, draft B	VNIIMS
COOMET.EM-S16	2013 - 2015	Planned	VNIIOFI
COOMET.EM-S6	2007 - 2010	Report in progress, draft B	VNIIMS
COOMET.EM-S7	2009 - 2011	Report in progress, draft B	VNIIMS
COOMET.M.D-S1	2012 - 2015	Protocol complete	VNIIM
COOMET.M.FF-S4	2009 - 2010	Report in progress, draft B	NSC "Institute of Metrology"
COOMET.M.F-S1	2008 - 2010	Report in progress, Draft B	VNIIM
COOMET.M.P-S1	2014 - 2015	Measurements completed	NSC "Institute of Metrology"
COOMET.PR-S1	2012 - 2013	Measurements completed	VNIIOFI
COOMET.PR-S5	2008 - 2011	Measurements completed	INIMET
COOMET.PR-S7	2013 - 2014	Report in progress, Draft B	VNIIOFI
EURAMET.EM-S33	2010 - 2011	Measurements in progress	LCOE
EURAMET.EM-S34	2010 - 2011	Protocol complete	LCOE
EURAMET.EM-S37	2011 - 2013	Measurements in progress	CMI
EURAMET.EM-S41	2014	Protocol complete	LNE
EURAMET.M.F-S2	2012 - 2013	Measurements in progress	BEV
EURAMET.M.M-S10	2015	Report in progress, Draft B	MIRS
EURAMET.M.T-S4	2015	Measurements completed	LNE
EURAMET.PR-S4	2012 - 2013	Measurements completed	LNE

(continued...)

SC identifier	Indicated year	Status Sep-2020	Pilot
EURAMET.PR-S5	2012 - 2013	Report in progress, Draft A	PTB
SIM.M.FF-S4	2006	Report in progress, draft B	CENAM
SIM.M.FF-S8	2014	Report in progress, draft A	CENAMEP AIP
SIM.M.F-S2	2012	Report in progress, draft A	IDIC
SIM.M.F-S3	2012 - 2013	Report in progress, draft B	NIST
SIM.M.M-S12	2012 - 2015	Report in progress, draft A	CESMEC
SIM.M.M-S6	2009	Report in progress, draft B	CESMEC
SIM.M.P-S2	2009 - 2011	Measurements in progress	INMETRO
SIM.M.P-S3	2010	Protocol complete	LCPN-P
SIM.M.P-S4	2010	Protocol complete	LCPN-P
SIM.M.P-S8	2012	Planned	LCPN-P
SIM.M.P-S9	2012	Planned	LCPN-P
SIM.QM-S3	2012	Report in progress, draft A	NIST
SIM.QM-S4	2012	Report in progress, draft A	NIST
SIM.QM-S5	2015	Planned	NIST
SIM.T-S3	2007 - 2008	Report in progress, draft B	INEN
SIM.T-S4	2008	Report in progress, draft B	LATU
SIM.T-S6	2012 - 2014	Report in progress, draft A	NIST
SIM.T-S8	2014	Measurements in progress	CESMEC

APPENDIX III List of knowledge transfer on the KCDB 2.0 until 26 August 2020

Group	Means	Date	Invited Participants/comments
CCAUV TC Chairs	WG-CMC meeting And CBKT	25/09/2019	AFRIMETS APMP COOMET EURAMET (<i>also CBKT</i>) (GULFMET) SIM
CCEM TC Chairs	Webex, CBKT	12/12/2019 04/10/2019 - -	AFRIMETS APMP COOMET EURAMET COOMET ⁵ (<i>also CBKT</i>) GULFMET (via TF) SIM (<i>CBKT</i>)
CCL TC Chairs	Webex, CBKT	- - 12/12/2019 - 12/12/2019 11/12/2019	AFRIMETS APMP (<i>CBKT</i>) COOMET (GULFMET) EURAMET (x 3, <i>also CBKT</i>) SIM
CCM TC Chairs	Webex, CBKT	10/10/2019 09/10/2019 09/10/2019 - 09/10/2019 10/10/2019	AFRIMETS APMP COOMET (<i>also CBKT</i>) EURAMET (<i>CBKT</i>) GULFMET SIM (<i>also CBKT</i>)
CCPR TC Chairs	WG-CMC meeting	16/09/2019 16/09/2019 16/09/2019 16/09/2019 16/09/2019 16/09/2019	AFRIMETS APMP COOMET EURAMET (<i>also CBKT</i>) GULFMET SIM
CCQM	Webex, CBKT	12/09/2019 - - - -	AFRIMETS (only KCWG rep.) APMP COOMET EURAMET (<i>CBKT</i>) SIM (<i>CBKT</i>)
CCRI TC Chairs	Webex, CBKT	21/11/2019 - 22/11/2019 21/11/2019 -	AFRIMETS APMP COOMET EURAMET (<i>also CBKT</i>) SIM (<i>CBKT</i>)
CCTF TC Chairs	Webex, CBKT	10/10/2019 09/10/2019 - 09/10/2019 10/10/2019 12/12/2019	AFRIMETS APMP COOMET GULFMET EURAMET SIM

⁵ Assisted by Nikita Zviagin

S. Picard and S. Maniguet

CCT TC Chairs	Webex, CBKT	14/11/2019 15/11/2019 15/11/2019 - 15/11/2019 14/11/2019	AFRIMETS APMP COOMET ⁽¹⁾ EURAMET (CBKT) GULFMET SIM
CBKT event	At the BIPM	4-8/11/2019	All RMOs, 25 participants
CBKT event	At the BIPM	17-19/11/2020	TC Chairs EURAMET
CBKT event	Zoom, CBKT	25-27/5/2020	Institutes of COOMET
CCQM KCWG	Webex, CBKT	4/6/2020	Demo on CCQM workflow
General Physics	Zoom, CBKT	9/6/2020	2 x demo to writers
Chemistry	Zoom, CBKT	25/6/2020	2 x demo to writers
Ionizing radiation	Zoom, CBKT	26/6/2020	2 x demo to writers
CCQM KCWG	Webex, CBKT	29/6/2020	Demo to TC Chairs and reviewers