

KCDB REPORT TO THE 38th JCRB MEETING

1 March to 1 September 2017

Introduction

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

The EXCEL files used as a basis for the CMC statistics are available on the [access-restricted JCRB CMC website](#) (on “KCDB statistics”). They are updated successively during the year and the CMCs that have been modified are highlighted in pink according to previous JCRB decisions.

Further information on the KCDB may be found on the BIPM KCDB web pages. Notably, the number of key and supplementary comparisons, as well as the number of CMCs by metrology area and by country, are updated successively during the year and may be consulted on the [KCDB Statistics](#) web page¹.

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 summary on progress made on the **revision of the KCDB**, in the context of the Review in the CIPM MRA, is presented in Section 4.

1. CIPM MRA Appendix C : Calibration and Measurement Capabilities

1.1. Status of the KCDB CMC database

End of February 2017, the KCDB included a total of 24 974 CMCs:

- 18 693 in Physics,
- 6 281 in Chemistry.

Over the last six months 34 countries published CMCs. The total number of CMCs increased by 319 over the last 12 months, corresponding to a relative increase of 1 %.

The evolution of the number of CMCs since 2008 is depicted in Figure 1. The number of CMCs presently published in the KCDB by state/economy and metrology area is continuously available on [KCDB Statistics](#).

¹ On request, the KCDB Office may provide an EXCEL file listing information on the present contents of the CIPM MRA Appendix B.

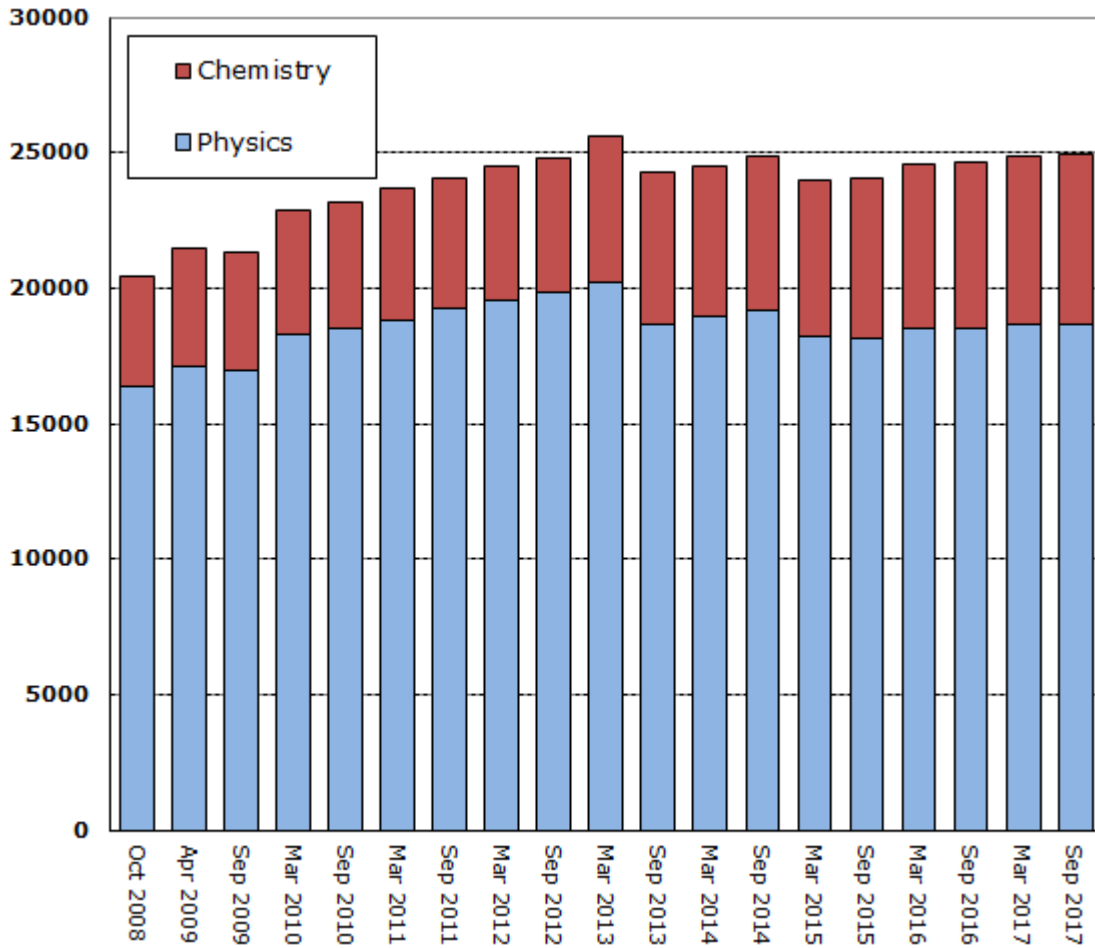


Figure 1. Number of CMCs registered in the KCDB since October 2008.

1.2. CMC publications (excluding revisions)

CMCs treated by the BIPM KCDB Office between 1 March to 1 September 2017 are listed in Table 1²

Table 1. Published CMCs from 1 March to 1 September 2017 (revised CMCs not included)

	RMO / economy	Field	CMCs
March 2017	IT	TF	-2
April 2017	IT*	QM	-1
	AFRIMETS : TN	TF	+10
	SIM: US	PR	-19
	SIM: CA	EM	-163
	SIM: PA	EM	+3
May 2017	SIM: US	PR	-19
	SIM: CA	EM	-163
	SIM: PA	EM	+3
	DK	EM	-1
	EURAMET : BG, CH, CZ, DE, ES, IT, NL, PL, RO, UK	PR	+88
	FI	M	+6
	SIM: BR	EM	+3
June 2017	APMP : ID, KR	AUV	+27
	COOMET : RU	M	+1
	EURAMET : FI	M	+1
	COOMET : BY, KZ	EM	+5
	EURAMET : BA, BE, CH, CZ, DE, ES, FI, FR, NL, PL, SI	EM	+48
July 2017	COOMET : UA	M	+1
	COOMET : RU	T	+6
	UK	L	-1
	SIM : BR	M	+11
	SIM : CA	AUV	+4
	AT	M	-3
	NL	PR	-1
August 2017	NL	PR	-1
	COOMET : BY, KZ, RU, UA	QM	+33
	AFRIMETS : ZA	L	+19

* : result of greying out

Bosnia Herzegovina provided their first CMCs in Electricity and Magnetism and Ukraine published their first CMC in high purity (Chemistry).

² Published CMCs are announced in "[CMCs News](#)".

1.3. Deleted CMCs, Greying out and Re-instatements

Greying-outs, deletion and reinstatements of CMCs are coordinated by the JCRB Executive Secretary, and carried out by the KCDB Office. Table 2 lists the CMCs concerned during the last six months.

Table 2. Deleted, greyed-out or reinstated CMCs from 1 March to 1 September 2017

	State/economy	Field	Action
19 April	IT	QM	Greyed out 1 CMCs in gas
03 May	MX	PR	Deleted 3 CMCs previously greyed out
03 May	US	PR	Reinstated 1 CMC
24 May	FI	M	Reinstated 6 CMCs (3 in force, 3 in torque)
30 June	BE	EM	Reinstated 1 CMC

The present situation regarding temporary removal (“greying-out”) of CMCs is available on-line of the [Statistics page of the KCDB](#) at the JCRB restricted web, illustrated in Table 3. In total 206 CMCs are presently greyed out.

The dates of the greying-out of CMCs are listed in the spreadsheet “Dates of CMCs greying-out” of the EXCEL file “CMCsNumber_2017, available from the [access-restricted JCRB CMC website](#) (see “KCDB statistics”).

Table 3. Number of CMCs temporary removed (“greyed-out”) from the KCDB, by country and by metrology area, as at 1 September 2017.

	AUV	M	PR	EM	T	RI	L	QM	TF	Total
AFRIMETS										
ZA		2								2
Total AFRIMETS:										2
APMP										
AU				27						27
NZ										0
TH						3				3
Total APMP:										30
COOMET										
KZ								1 partially Cat. 6		0
Total COOMET:										0
EURAMET										
BE				25					6	31
FI		0								0
FR		1		3						4
IAEA						1				1
IRMM										
IT		30		15			1	3		49
LV				30						30
PT							1			1
SK	6						2			8
Total EURAMET:										124
SIM										
MX			22					2	9	33
AR							1			1
CA							0			0
US		3	0	8		1				12
BR								4		4
Total SIM:										50
TOTAL:										206

1.4. CMC statistics of RMOs

(Follow-up of Action 17/1 from the 17th JCRB meeting)

Table 4 summarizes the repartition of CMCs on the different RMOs and international signatories of the CIPM MRA.

Table 4. Information on CMC statistics per RMO

Entity	Total number of CMCs 25 August 2017
AFRIMETS	554
APMP	5803
COOMET	2477
EURAMET	11177
GULFMET ³	0
SIM	4717
ESA	0
IAEA	26
JRC ⁴	217
WMO	3

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

⁴ Earlier IRMM (EC Geel)

2. CIPM MRA Appendix B : Key and supplementary comparisons

2.1. Present status

On the 1 September 2017 the KCDB covered **1500 comparisons** distributed as listed in Table 5; 985 key comparisons and 515 supplementary comparisons. In fact, 68 of the 92 BIPM key comparisons are all part of the BIPM.RI(II)-K1 (SIR equivalent activity). On the other side, 22 continuous BIPM⁵ comparisons cover each tens of completed comparisons carried out between the BIPM and different metrology institutes.

Of the 35 comparisons registered in the KCDB since the last JCRB meeting, 7 comparisons were registered for GULFMET. GULFMET has hence now 14 comparisons registered in the KCDB. GULFMET countries participate in 19 comparisons organized by GULFMET, by other RMOs or Consultative Committees.

Figure 2 shows the evolution of the total number of key (green) and of supplementary (violet) 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, 1 out of 5 in 2006, has progressively increased to 1 out of 3.

Table 5. Key and Supplementary Comparisons on 1 September 2017.

Entity	KC	SC
BIPM	92	1
CC	479	29
AFRIMETS	5	19
APMP	134	104
COOMET	48	87
EURAMET	160	176
GULFMET ⁶	3	11
SIM	64	88

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.

Updated graphs illustrating the participation in [key](#) and [supplementary](#) comparisons were made available on the [Statistics page of the KCDB](#) in March 2017.

⁵ Of which two

⁶ The GULFMET was approved as an RMO on a provisional basis by the CIPM in October 2015.

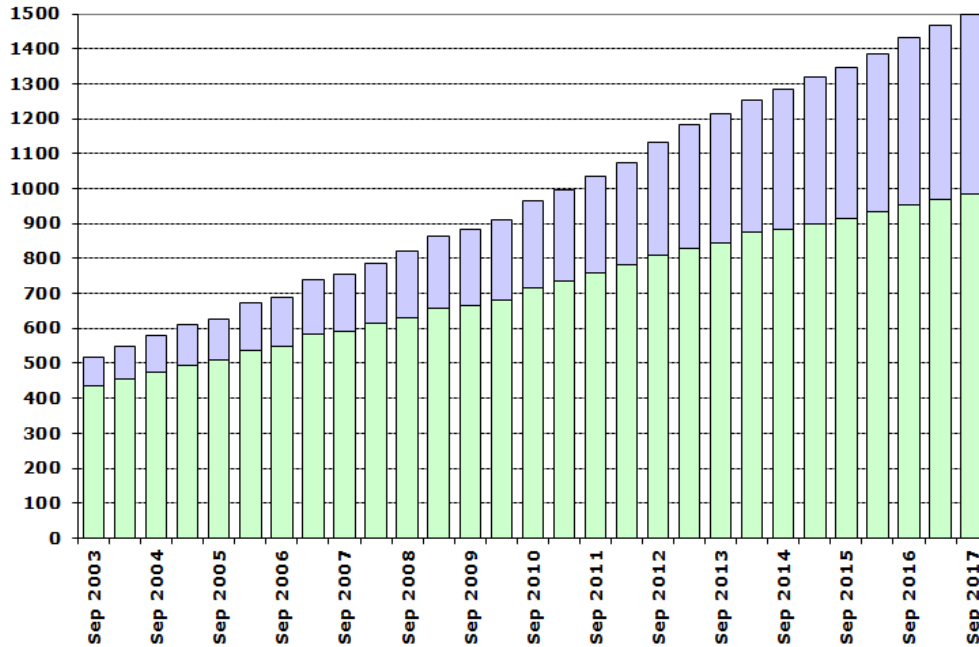


Figure 2. Total number of key comparisons and supplementary comparisons registered in the KCDB: evolution since September 2003

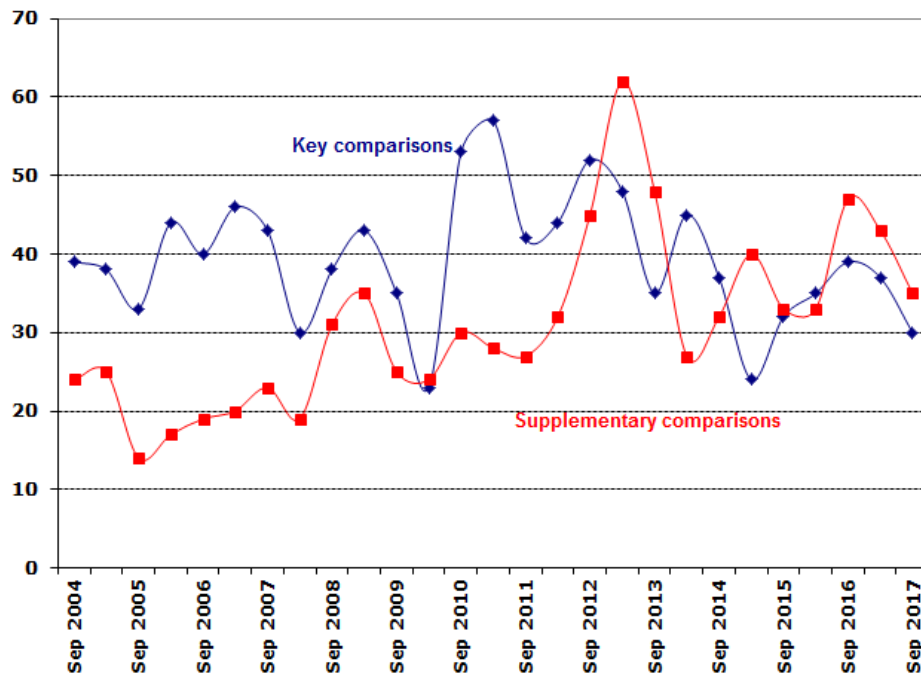


Figure 3. Number of new comparisons registered in the KCDB over the one-year period ending at the date indicated on the abscissa.

2.2. Registrations and modifications of comparisons

From 1 March 2017 the following 36 comparisons were registered as new:

AFRIMETS.M.D-S4	COOMET.M.M-S3	GULFMET.M.F-S1
AFRIMETS.M.M-K7	COOMET.M.P-S3	GULFMET.M.F-S2
APMP.EM-S15	COOMET.M.P-S4	GULFMET.M.M-K4
APMP.T-S16	COOMET.RI(I)-S4	GULFMET.M.M-S2
CCAUV.V-K5	COOMET.T-K9.1	GULFMET.M.P-S1
CCPR-K1.a.2017	EURAMET.QM-S11	GULFMET.T-K9.1
CCPR-K2.a.2016	EURAMET.RI(I)-K1.2	SIM.EM-S13
CCPR-K4.2017	EURAMET.RI(I)-K4.2	SIM.M.D-S6
CCQM-K148.a	EURAMET.RI(I)-K5.1	SIM.M.FF-K4.1.2017
CCQM-K149	EURAMET.T-K6.2	SIM.M.FF-S10
CCRI(II)-S13	EURAMET.T-K8.1	SIM.M.M-S17
COOMET.EM-S21	GULFMET.L-S1	SIM.T-K6.7

End of August, 51 abandoned or superseded key and supplementary comparisons were kept in the KCDB archives.

The EMI (UAE) became a National Metrology Institute in June 2017. As the comparisons in which EMI participates all are recent, EMI was added as a participant of these to the KCDB.

2.3. Published results of key and supplementary comparisons

From 1 March 2017 the following 48 reports were published:

AFRIMETS.AUV.A-K5	BIPM.RI(I)-K3 (NIST)	CCQM-K84
AFRIMETS.T-S1	BIPM.RI(I)-K6 (VSL)	COOMET.M.V-S1
AFRIMETS.T-S5	CCM.FF-K3.2011	COOMET.M.V-S2
APMP.AUV.V-K2	CCPR-K6.2010	COOMET.PR-K4.1
APMP.EM.BIPM-K11.3	CCQM-K102	COOMET.QM-K111
APMP.M.M-K4.1	CCQM-K103	EURAMET.EM-K12
APMP.M.P-S7.TRI	CCQM-K104	EURAMET.L-K8
APMP.QM-K46	CCQM-K108.2014	EURAMET.L-S25
APMP.QM-S2.2015	CCQM-K111	EURAMET.M.FF-K4.2.2014
BIPM.EM-K13.a.b	CCQM-K111.1	EURAMET.M.G-K2
BIPM.EM-K14 (NIS)	CCQM-K113	EURAMET.PR-K3.a.1
BIPM.EM-K14 (NMISA)	CCQM-K123	EURAMET.PR-K6.2
BIPM.EM-K14 (NMSI-NLM)	CCQM-K124	EURAMET.QM-K111
BIPM.QM-K1 (ISCIH)	CCQM-K125	EURAMET.T-K1
BIPM.QM-K1 (VSL)	CCQM-K127	GULFMET.EM.RF-S1
BIPM.RI(I)-K1 (SCK-CEN 2016)	CCQM-K132	SIM.M.G-K1

2.4. Follow-up on JCRB Action 33/3

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.*

Information on the number of comparison of this category is not large enough to conclude whether or not the observed increase is significant, as illustrated in Figure 4 where statistics regarding key and supplementary comparisons have been illustrated for the period September 2015 to September 2017. A list of the comparisons concerned may be found in Appendix.

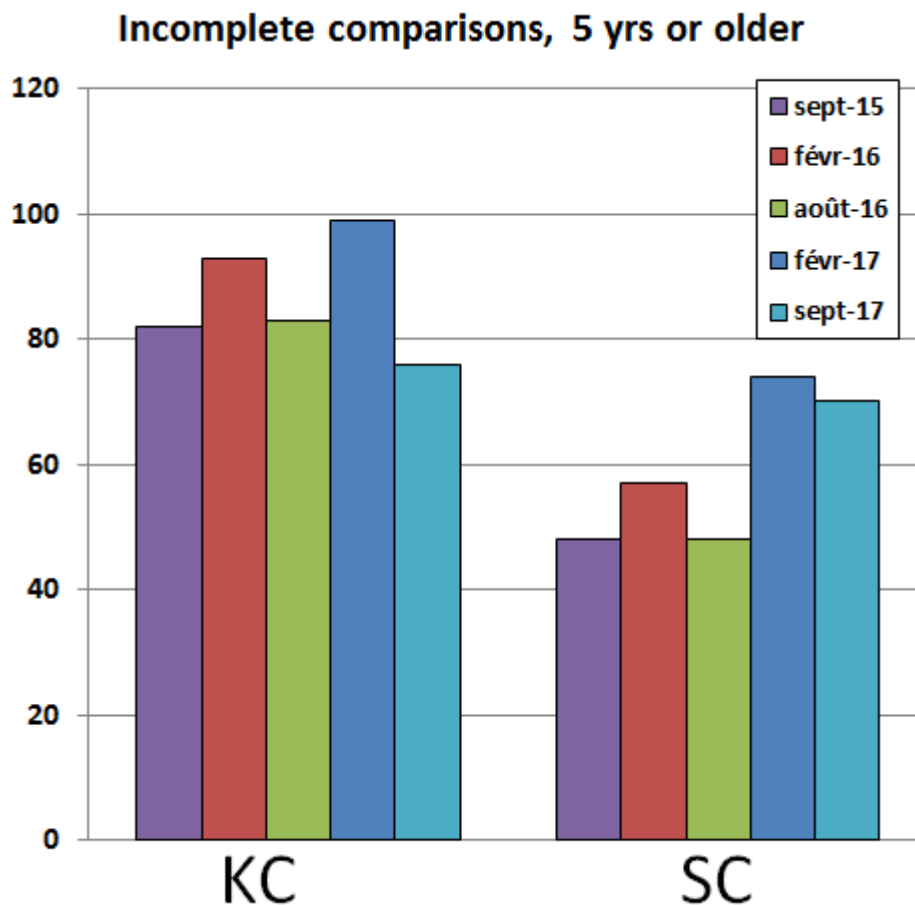


Figure 4. Histogram showing the number of incomplete comparisons that started more than 5 years ago.

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

Table 6 summarizes the participation of the [41 Associates of the CGPM](#) in CIPM MRA activities as at 1 March 2017.

The increase of CMCs during the last 12 months is 5 %. CMCs within new areas were published for Bosnia Herzegovina and Ukraine, but almost half of the Associates have no CMCs published yet in the KCDB. The repartition of CMCs among Associates is illustrated in Figure 5.

The increase in Associate participation in comparisons increased by 13% since last year, both for key as for supplementary comparisons. The comparison participation by Associates is illustrated in Figure 6.

Table 6. CIPM MRA activity of the NMIs of Associates of the CGPM: important dates, number of published CMCs and participation in key and supplementary comparisons.^{7,8}

Associate of the CGPM	Date of becoming an Associate	Date of signature of the CIPM MRA	Published CMCs	Greyed-out CMCs	Date of publication of the first CMC	Area of the first CMC	Key comparisons	Supplementary comparisons
Albania	10 September 2007	10 October 2007	7	0	05 April 2013	Mass Standards	9	4
Azerbaijan	01 January 2015	28 January 2015	0	0	-	-	1	6
Bangladesh	29 March 2010	25 March 2011	0	0	-	-	1	2
Belarus	05 May 2003	14 October 2003	240	0	07 April 2004	Acoustics, Ultrasound and Vibration	38	45
Bolivia	04 April 2008	16 May 2008	2	0	19 July 2016	Chemistry	6	20
Bosnia and Herzegovina	24 May 2011	15 June 2011	59	0	08 June 2012	Mass Standards	13	7
Botswana	30 May 2012	26 July 2012	0	0	-	-	1	3
CARICOM	10 October 2005	12 October 2005	0	0	-	-	0	11
Chinese Taipei	26 April 2002	04 June 2002	371	0	21 October 2003	Mass Standards, Force, Hardness, Pressure	101	48
Costa Rica	29 January 2004	06 October 2004	67	0	26 November 2008	Mass Standards	21	27
Cuba	19 December 2000	18 June 2001	113	0	02 May 2005	Ionizing radiation (I and II)	6	21
Ecuador	20 November 2000	15 April 2001	20	0	16 September 2011	Mass Standards	6	20
Estonia	27 January 2005	23 March 2005	4	0	05 May 2014	Humidity	10	10
Georgia	01 January 2008	17 June 2008	30	0	20 March 2014	Thermometry	7	13
Ghana	17 September 2009	24 February 2010	0	0	-	-	2	4
Hong Kong, China	08 April 2000	31 May 2000	238	0	13 December 2000	Length (Laser, Dimensional)	86	29
Jamaica	15 September 2003	21 July 2004	22	0	24 August 2006	Mass Standards	8	10
Latvia	11 January 2001	13 March 2001	29	30	23 March 2005	Length (Dimensional)	13	7
Luxembourg	29 January 2014	01 October 2014	0	0	-	-	2	1
Macedonia (fmr Yugoslav Rep. of)	10 October 2006	14 November 2007	21	0	02 July 2013	Fluid Flow	8	8
Malta	11 April 2001	20 June 2001	0	0	-	-	5	4
Mauritius	05 October 2010	09 March 2011	0	0	-	-	2	1
Moldova, Republic of	01 January 2007	14 November 2007	42	0	26 September 2013	Thermometry	3	17
Mongolia	07 August 2013	23 October 2013	0	0	-	-	4	3
Montenegro	01 August 2011	19 October 2011	19	0	20 November 2015	Thermometry	8	4
Namibia	10 August 2012	16 October 2012	0	0	-	-	0	2
Oman	08 May 2012	20 November 2014	0	0	-	-	0	2
Panama	03 August 2003	16 September 2003	37	0	11 September 2006	Mass Standards	10	18
Paraguay	06 May 2009	27 October 2009	24	0	31 January 2011	Mass Standards	3	16
Peru	28 May 2009	17 November 2009	106	0	03 August 2010	Mass Standards	24	37
Philippines	01 June 2002	19 December 2002	31	0	18 December 2013	Mass Standards	13	8
Qatar	10 March 2016	16 March 2016	0	0	-	-	2	1
Seychelles	10 September 2010	12 November 2010	0	0	-	-	0	2
Sri Lanka	14 November 2007	14 November 2007	0	0	-	-	5	2
Sudan	26 June 2014	26 June 2014	0	0	-	-	0	1
Syrian Arab Republic	31 May 2012	17 September 2012	0	0	-	-	12	3
Ukraine	19 August 2002	14 October 2003	261	0	10 January 2005	Length (Laser, Dimensional)	57	77
Viet Nam	10 October 2003	16 September 2004	31	0	21 July 2010	Time and Frequency	31	7
Yemen	21 July 2014	17 November 2014	0	0	-	-	0	0
Zambia	10 December 2010	3 February 2011	0	0	-	-	2	5
Zimbabwe	14 September 2010	14 January 2011	0	0	-	-	1	5

Total: 1774 30

Total: 521 511

⁷ 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.

⁸ As the numbers on participation in key and supplementary comparisons change comparatively slowly with time, the corresponding KCDB statistics are updated every six months (in May and November of each year). However, the numbers of CMCs published in the KCDB varies more rapidly and are updated in "real-time". The numbers given here show the situation as on 25 August 2017.

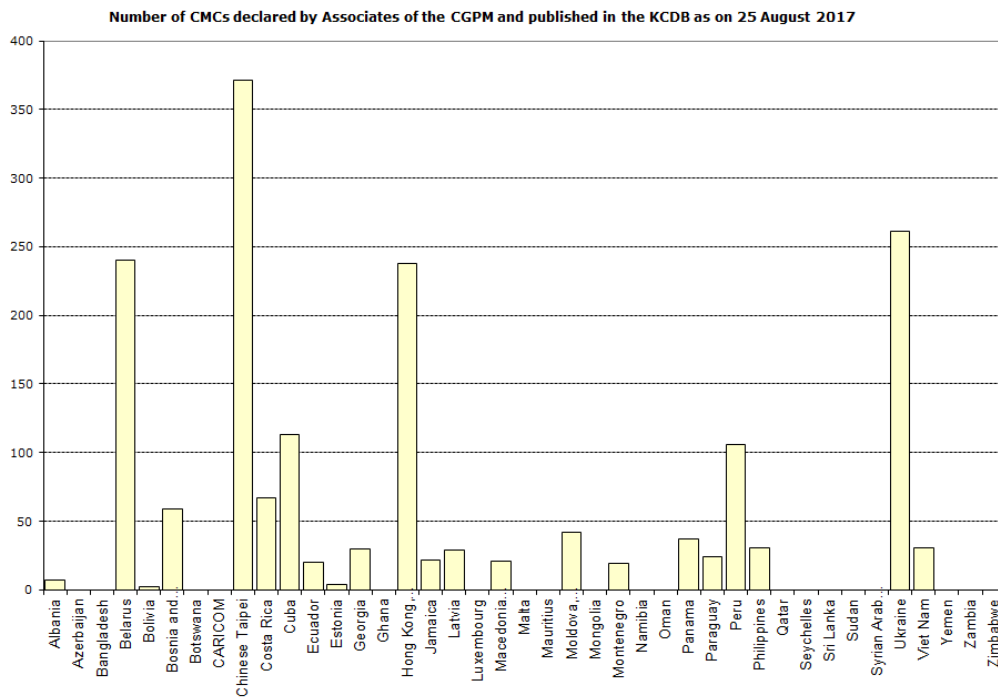


Figure 5. Graph on the number of CMCs declared by Associates of the CGPM

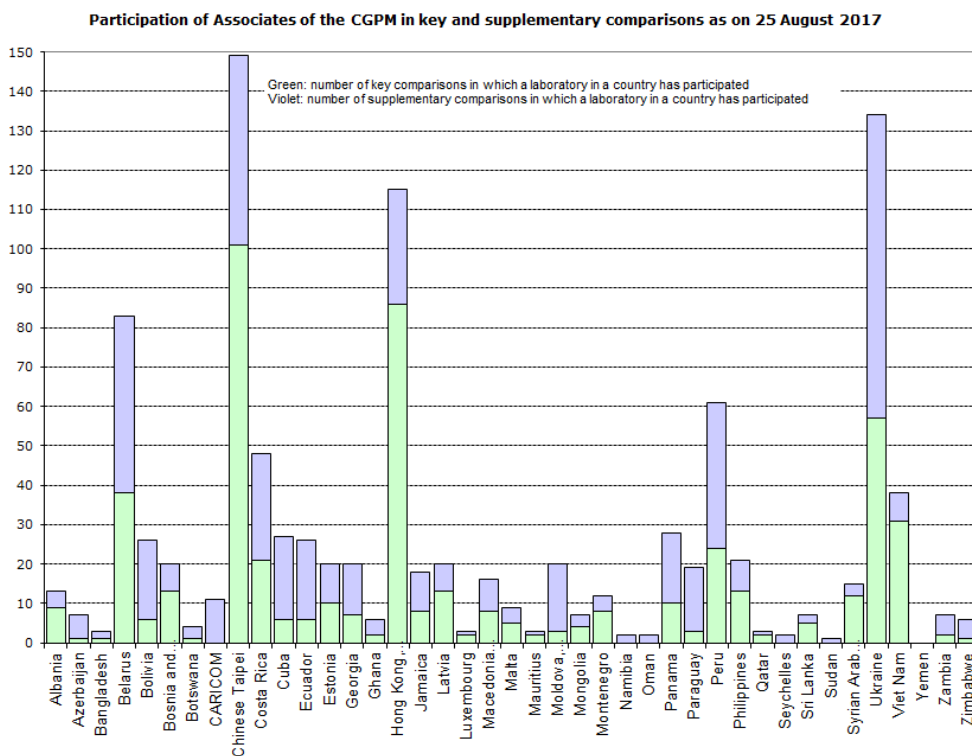


Figure 6. Graph on the participation of Associates of the CGPM in key and supplementary comparisons

4. Revision of the BIPM KCDB

The issued recommendations by the Working Group on the Implementation and Operation of the CIPM MRA [*Report of the Working Group on the Implementation and Operation of the CIPM MRA*](#) were adopted at the 105th meeting of the CIPM in October 2016, where several recommendations concerned a revision of the KCDB.

Since the last JCRB meeting, the BIPM has completed the Functional and Technical Specifications for the KCDB revision and a call for tenders was launched on 21 April 2017. The deadline was extended twice at the request of the proposers and was finally fixed to 7 July 2017. While this report is being drafted, the choice of service provider is in progress.

Following the Working Group recommendations, the following main targets have been identified for the KCDB revision:

- 1) To create a restricted-access web-based CMC platform for exchange of CMC data and support of the entire CMC review process.
- 2) To create improved search facilities.
- 3) To create the possibility to track comparison in “real-time”.

The question on legacy data is also an important question and is a major technical issue.

The KCDB Office, constituted by 2 staff members where both are sharing their time with two other departments, faces limiting resources during the development of the KCDB 2.0. The requested additional time has created delays sometimes larger than usual in publishing CMC and comparison data in the KCDB.

The revision of the KCDB, of priority for the KCDB Office, is expected to start in September. The year 2018 will cover the transition from the “KCDB 1.0” to “KCDB 2.0” that will be planned with the service provider and for which the Consultative Committees of course will be consulted.

APPENDIX List of uncompleted comparisons older than 5 years

a) Key Comparisons

KC identifier	Status Aug 2017	Indicated year	Pilot	Note
AFRIMETS.M.P-K2	In progress	2012 - 2013		Added in 2017
APMP.EM.BIPM-K11.2	Report in progress, Draft B	2004	Puslit KIM-LIPI	
APMP.EM.RF-K8.CL	Measurements completed	2012 - 2013	KRISS	Added in 2017
APMP.EM-K2	In progress	2010 - 2011	KRISS	
APMP.EM-K5.1	Report in progress, Draft A	2010 - 2013	NIM	
APMP.M.D-K4	Report in progress, Draft A	2007 - 2008	KRISS	
APMP.M.F-K2	Report in progress, Draft A	2007 - 2013	KRISS	
APMP.M.F-K3.a	In progress	2011 -	NIM	Added in 2016
APMP.M.F-K3.b	In progress	2011 -	NIM	Added in 2016
APMP.M.H-K1.b	Report in progress, Draft A	2003 - 2005	NMIJ AIST	
APMP.M.H-K1.c	Report in progress, Draft A	2003 - 2005	NMIJ AIST	
APMP.M.M-K2.2	In progress	2010	KRISS	
APMP.M.M-K5	Planned		NIM	
APMP.M.P-K1.c.2	Report in progress, Draft B	2012	KRISS	Added in 2017
APMP.M.P-K9	Report in progress, Draft A	2009 -	KRISS, NMIA	
APMP.PR-K2.a.1	Measurement completed	2010 - 2012	NMIA	
APMP.PR-K2.b.1	In progress	2010 - 2012	NMIA	
APMP.PR-K3.a	In progress	2012 - 2014	NMIJ AIST	Added in 2017
APMP.PR-K3.a.1	Measurement completed	2006	NIM	
APMP.PR-K4	Report in progress, Draft B	2006 - 2007	NIM	
APMP.RI(I)-K2.B	Report in progress, Draft A	2007	NMIJ AIST	
APMP.RI(I)-K4	Report in progress, Draft A	2009 - 2010	NMIJ AIST	
APMP.T-K3.5	Measurements completed	2011 - 2014	KRISS	Added in 2016
APMP.T-K7.1	Protocol complete	2011 - 2012	NMIJ-AIST	Added in 2016
APMP.T-K8	In progress	2011 - 2013	NMIJ-AIST	Added in 2016
CCEM.RF-K5.c.CL	In progress	2012 - 2015	NMIJ AIST	Added in 2017
CCEM-K2.2012	In progress	2012 - 2015	NRC	Added in 2017
CCL-K1.2011	In progress	2011 - 2014	CENAM, NRC	Added in 2016
CCM.F-K3.a	Report in progress, Draft A	2005 - 2007	PTB	
CCM.F-K3.b	Report in progress, Draft A	2005 -	PTB	
CCM.V-K3.A	Report in progress, Draft A	2012 - 2013	NMIJ AIST	Added in 2017
CCM.V-K3.B	Report in progress, Draft A	2012 - 2013	NMIJ AIST	Added in 2017
CCM.V-K3.C	Report in progress, Draft A	2012 - 2013	NMIJ AIST	Added in 2017
CCQM-K11.2	Report in progress, Draft B	2012	NIST	Added in 2017
CCQM-K12.2	Report in progress, Draft A	2012	NIST	Added in 2017
CCQM-K6.2	Report in progress, Draft B	2012	NIST	Added in 2017
CCRI(II)-K2.Fe-55	Report in progress, Draft B	2005 - 2006	BIPM	
CCRI(II)-K2.H-3	Report in progress, Draft B	2008 - 2009	BIPM	
CCRI(II)-K2.I-125(2)	Report in progress, Draft B	2004 - 2005	BIPM	
CCRI(III)-K2.Kr-85	Report in progress, Draft B	2008	BIPM	
CCRI(III)-K2.Mn-54	Report in progress, Draft B	2003	BIPM	
CCRI(III)-K2.P-32	Report in progress, Draft B	2002 - 2003	BIPM	
CCRI(II)-K2.P-32.2	Report in progress, Draft A	2005	BIPM	
CCRI(II)-K2.Pu-238	Report in progress, Draft B	2001	BIPM	
CCRI(III)-K2.Sr-89	Report in progress, Draft B	2000 - 2001	BIPM	
CCRI(II)-K2.Sr-90	Report in progress, Draft A	1997 - 1998	BIPM	
CCRI(III)-K2.Tc-99	In progress	2012 - 2013	NPL	Added in 2017
CCRI(II)-K2.Tl-204	Report in progress, Draft B	2002 - 2003	BIPM	
CCRI(III)-K9.AmBe.1	Report in progress, Draft A	2012 - 2013	NPL	Added in 2017

(continued...)

KC identifier	Status Aug 2017	Indicated year	Pilot	Note
CCT-K1.1	Report in progress, Draft A	2006 - 2014	NIST	
CCT-K4.1	In progress	2012 - 2014	NMIA	Added in 2017
CCT-K6.1	Report in progress, Draft A	2008 - 2010	NPL	
CCT-K9	Measurements completed	2011 - 2012	NIST	Added in 2016
COOMET.AUV.V-K1	Report in progress, Draft B	2007 - 2008	VNIIM	
COOMET.L-K3	Report in progress, Draft A	2011 - 2012	VNIIM	Added in 2016
COOMET.M.H-K2	Report in progress, Draft B	2007 - 2010	VNIIFTRI	
COOMET.M.M-K8	In progress	2012 - 2016	NSC	Added in 2017
COOMET.PR-K3.a	Report in progress, Draft A	2009 - 2011	BeIGIM	Progress since 2/2016
EURAMET.L-K3.2009	Report in progress, Draft A	2009 - 2015	PTB	Progress since 2/2016
EURAMET.M.D-K1.1	Report in progress, Draft A	2008 - 2012	PTB	
EURAMET.M.FF-K5.a	Protocol complete	2009	PTB	
EURAMET.M.P-K1.c	In progress	2011 - 2014	FORCE	Added in 2016
EURAMET.M.P-K7	Report in progress, Draft B	2005 - 2007	MIKES	
EURAMET.PR-K2.a	Measurements completed	2010 - 2012	VSL	
EURAMET.PR-K5	Measurement completed	2007 -	MKEH	
EURAMET.T-K3.4	Report in progress, Draft A	2010 - 2011	MIRS/UL-FE/LMK	
EUROMET.M.F-K1	Report in progress, Draft B	2002 - 2004	MIKES	
EUROMET.M.F-K3	In progress	2005 -	PTB	
EURAMET.T-K8	Report in progress, Draft A	2008 - 2012	PTB	
SIM.AUV.V-K1.1	Report in progress, Draft B	2005	INMETRO	
SIM.M.P-K1	Protocol complete	2008 - 2010	CENAM	
SIM.M.P-K2	In progress	2011 - 2013	INTI	Added in 2016
SIM.M.P-K6	In progress	2008 - 2011	CENAM	
SIM.M.P-K6.1	In progress	2011 - 2013	LACOMET	Added in 2016
SIM.M.P-K7	Report in progress, Draft B	2001	CENAM	
SIM.QM-K1	Report in progress, Draft B	2009	INMETRO	

b) Supplementary Comparisons

SC identifier	Status Aug 2017	Indicated year	Pilot	Note
AFRIMETS.L-S4	Measurements completed	2012	PTB	Added in 2017
AFRIMETS.RI(I)-S1	In progress	2011 - 2013	NMISA	new in 2016
AFRIMETS.T-S2	In progress	2012	NMISA	Added in 2017
AFRIMETS.T-S3	In progress	2012	NMISA	Added in 2017
APMP.EM-S8	Protocol complete	2011 - 2013	NPLI	new in 2016
APMP.L-S5	In progress	2012	NMIJ AIST, CMS	Added in 2017
APMP.M.G-S1	Report in progress, Draft A	2012	NIM	Added in 2017
APMP.M.H-S4	Report in progress, Draft A	2011	KRISS	
APMP.M.MM-S1	In progress	2012 - 2013	KRISS	Added in 2017
APMP.M.M-S1	Planned	2007	NPSL Pakistan	
APMP.M.P-S1	Measurement completed	2003 - 2005	CMS/ITRI	
APMP.PR-S1.2	Protocol complete	2008	NMC, A*STAR	
APMP.PR-S5	Measurement completed	2008 - 2009	NMIJ AIST	
APMP.PR-S6	In progress	2012 - 2013	KRISS	Added in 2017
APMP.RI(I)-S1	Report in progress, Draft B	2010 - 2011	OAP	
APMP.T-S8	In progress	2011 - 2015	NMLPHIL	new in 2016
CCRI(II)-S10	Report in progress, Draft A	2011 - 2012	ENEA-INMRI	new in 2016
CCRI(II)-S6.Co-57	Report in progress, Draft B	2008	IAEA	
CCRI(II)-S6.I-131	Report in progress, Draft B	2006	IAEA	
CCRI(II)-S9	Report in progress, Draft A	2011	KRISS	new in 2016
CCT-S2	Report in progress, Draft B	2007 - 2010	LNE	Progress 9/2015 to 2/2016
CCT-S3	Report in progress, Draft A	2007 - 2008	NMIJ AIST	
COOMET.EM.RF-S1	In progress	2009	VNIIFTRI	
COOMET.EM-S10	Report in progress, Draft B	2010 - 2012	VNIIMS	
COOMET.EM-S6	Report in progress, Draft B	2007 - 2010	VNIIMS	
COOMET.EM-S7	Report in progress, Draft B	2009 - 2011	VNIIMS	
COOMET.EM-S9	In progress	2009	VNIIFTRI	
COOMET.M.D-S1	Protocol complete	2012 - 2015	VNIIM	Added in 2017
COOMET.M.FF-S2	Report in progress, Draft B	2008 - 2009	PTB	
COOMET.M.FF-S4	Report in progress, Draft B	2009 - 2010	SMU	
COOMET.M.F-S1	Report in progress, Draft B	2008 - 2010	VNIIM	
COOMET.PR-S1	Measurements completed	2012 - 2013	VNIIOFI	Added in 2017
COOMET.PR-S2	Report in progress, Draft B	2011 - 2012	VNIIOFI	new in 2016
COOMET.PR-S5	Measurements completed	2008 - 2011	INIMET (Cuba)	Progress 9/2015 to 2/2016
EURAMET.EM-S31	Measurement completed	2009 - 2010	PTB	
EURAMET.EM-S33	In progress	2010 - 2011	LCOE (Spain)	
EURAMET.EM-S34	Protocol complete	2010 - 2011	LCOE (Spain)	
EURAMET.EM-S35	Protocol complete	2012 - 2013	INRIM	Added in 2017
EURAMET.EM-S36	Planned	2012 - 2014	SP	Added in 2017
EURAMET.EM-S37	In progress	2011 - 2013	CMI	new in 2016
EURAMET.M.F-S2	In progress	2012 - 2013	BEV	Added in 2017
EURAMET.M.M-S3	Report in progress, Draft B	2011 - 2012	UME	Progress since 2/2016
EURAMET.M.M-S5	Planned	2012 - 2013	NSAI NML	Added in 2017
EURAMET.PR-S4	Measurements completed	2012 - 2013	LNE	Added in 2017
EURAMET.PR-S5	Measurements completed	2012 - 2013	PTB	Added in 2017
EURAMET.T-S4	Report in progress, Draft B	2007 - 2009	NPL	
EURAMET.RI(III)-S1	Report in progress, Draft B	2003 - 2007	IRSN	

(continued...)

SC identifier	Status Aug 2017	Indicated year	Pilot	Note
SIM.AUV.A-S1	Report in progress, Draft B	2001 - 2002	CENAM	
SIM.M.D-S4	Protocol complete	2012	INDECOPI	Added in 2017
SIM.M.D-S5	In progress	2012 - 2013	INM (CO)	Added in 2017
SIM.M.FF-S4	Report in progress, Draft B	2006	INIMET (Cuba)	
SIM.M.F-S2	Planned	2012	IDIC	Added in 2017
SIM.M.F-S3	Report in progress, Draft B	2012 - 2013	NIST	Added in 2017
SIM.M.F-S4	Protocol complete	2012 - 2013	IDIC	Added in 2017
SIM.M.M-S11	In progress	2012 - 2013	INM (CO)	Added in 2017
SIM.M.M-S12	In progress	2012 - 2015	CESMEC Ltda.	Added in 2017
SIM.M.M-S13	Protocol complete	2012	INDECOPI	Added in 2017
SIM.M.M-S6	Report in progress, Draft B	2009	CESMEC (Chile)	
SIM.M.P-S1	Report in progress, Draft A	2007 - 2008	NIST	
SIM.M.P-S2	In progress	2009 - 2011	INMETRO	
SIM.M.P-S3	Protocol complete	2010	LCPN-P (Chile)	
SIM.M.P-S4	Protocol complete	2010	LCPN-P (Chile)	
SIM.M.P-S8	Planned	2012	ENAER	Added in 2017
SIM.M.P-S9	Planned	2012	ENAER	Added in 2017
SIM.PR-S3	Protocol complete	2012	NIST	Added in 2017
SIM.QM-S3	Report in progress, Draft A	2012	NIST	Added in 2017
SIM.QM-S4	Report in progress, Draft A	2012	NIST	Added in 2017
SIM.T-S3	Report in progress, Draft B	2007 - 2008	CESMEC, INEN	
SIM.T-S4	Report in progress, Draft B	2008	PTB	
SIM.T-S6	Report in progress, Draft A	2012 - 2014	NIST	Added in 2017