

KCDB REPORT TO THE 33rd JCRB MEETING

(covering the six-month period 01 March 2014 to 01 September 2014)

At the occasion of each JCRB meeting the KCDB Office prepares a report on the status of the KCDB. Each report describes the work of the KCDB Office during the previous six-month period, and the compilation of these reports to the JCRB thus provides a complete record of the evolution of the KCDB.

The previous report (JCRB-32/06) was presented at the 32nd meeting of the JCRB, held on 26 and 27 March 2014 at the BIPM, and reflected the situation as at 01 March 2014. The present report covers the six-month period from 01 March 2014 to 01 September 2014.

Notes from the KCDB Office to the JCRB members

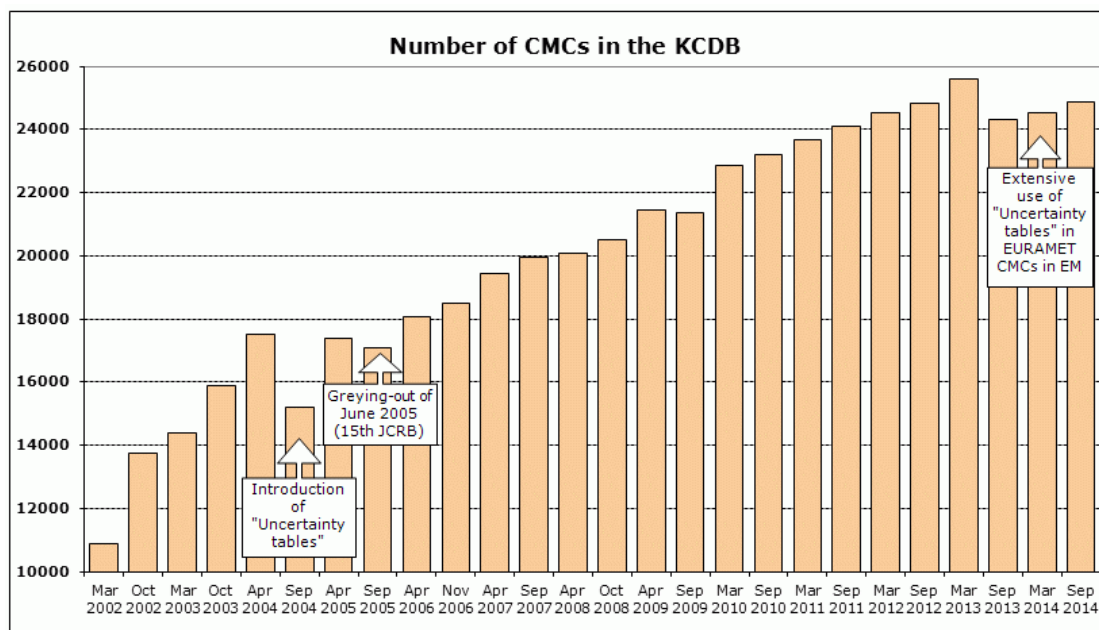
1. Statistics on the content of the KCDB are prepared by the KCDB Office and are available on-line from the [KCDB Statistics page](#). This includes the number of key and supplementary comparisons (updated in real-time), and PDF files showing the participation in key and supplementary comparisons (updated in May and November of each year) and the number of CMCs by metrology area and by country (updated in real-time).
2. The EXCEL files that are used to generate the PDF files displayed in the KCDB Statistics page are available from the [access-restricted JCRB CMC website](#) (link "[KCDB statistics](#)"). Note that these EXCEL files track all the changes (including greying-out and re-instatement of CMCs) and their dates, and thus allow some recollection of the history of the KCDB. In addition, many numbers that are not shown in the PDF files of statistics are given in the EXCEL files.
3. The KCDB Office provides on demand an additional EXCEL file containing the information of Appendix B of the KCDB, as a snapshot of the content of the database valid at a given date. This makes it possible to carry out statistical analysis using EXCEL functions or customized macro-functions. The file is compiled by the BIPM, using an SQL request named "Angela", and the delivery time is about two working days.
4. A box entitled "Related links" is provided on the left of each KCDB web page. It includes, among others, links to the KCDB Statistics page, to the KCDB FAQs page, and to the open-access CIPM MRA and JCRB documents, as well as to the open-access series of biannual KCDB Reports (located on the main BIPM website).

1. The CMC database

1.1. Content of the CMC database

As at 01 September 2014, the KCDB included a total of 24 870 CMCs:

- 15 132 in General Physics,
- 4 020 in Ionizing Radiation, and
- 5 718 in Chemistry.



Number of CMCs registered in the KCDB since March 2002

Over the period covered by this Report, 27 newly approved sets of CMCs were published (see Section 1.2 below), corresponding to an additional 350 CMCs (nearly 200 of them cover the field of Chemistry). There were also some movements related to temporary removal and re-instatement of CMCs (see Section 1.3 below).

Details on the number of CMCs currently published in the KCDB, per country and per metrology area, are openly available in real-time from the [Statistics page of the KCDB](#) (PDF file).

1.2. New CMCs publication – see also “[CMCs News](#)”

The following sets of CMCs were published in the KCDB between 01 March 2014 and 01 September 2014:

- 02 March 2014; *COOMET.M.18.2013* (KZ, Hardness), +2 CMCs.
- 13 March 2014; *COOMET.PR.9.2013* (RU), +6 CMCs.
- 20 March 2014; *COOMET.T.9.2014* (GE), +9 CMCs: **first set of CMCs from Georgia published in the KCDB.**
- 21 March 2014; *APMP.RI.6.2011* (TH, Dosimetry), +3 CMCs.
- 25 March 2014; *APMP.M.25.2010* (IN, Hardness), +3 CMCs.
- 27 March 2014; *EURAMET.T.15.2014* (BG), +8 CMCs.
- 28 March 2014; *COOMET.M.20.2014* (RU, Density), +2 CMCs.
- 28 March 2014; deletion of CMCs in QM (Cat 10): CZ, -14 CMCs.
- 09 April 2014; deletion of CMCs in L: CZ, -2 CMCs; and GB, -1 CMC.
- 25 April 2014; *APMP.L.23.2014* (JP), +12 CMCs.
- 02 May 2014; *SIM.M.26.2013*, Fluid Flow (CR, +8 CMCs; MX, -1 CMC; PE, +7 CMCs; US, -11 CMCs; UY, +4 CMCs), total: +7 CMCs.
- 02 May 2014; *COOMET.RI.10.2014* (UA, Radioactivity), +14 CMCs.
- 05 May 2014; *EURAMET.T.16.2014*, Humidity (NL, +6 CMCs; GR, +3 CMCs; GB, +3 CMCs; FI, +5 CMCs; SI, +5 CMCs; EE, +4 CMCs), total: +26 CMCs: **first set of CMCs from Estonia published in the KCDB.**
- 21 May 2014; *AFRIMETS.RI.3.2014* (EG, Dosimetry), +2 CMCs.
- 05 June 2014; *EURAMET.T.17.2014* (NL and NO), +8 CMCs.

- 10 June 2014; *APMP.T.10.2014* (CN, +7 CMCs; HK, +3 CMCs; ID, +3 CMCs; JP, +5 CMCs; KR, +5 CMCs; SG, +1 CMC; TH, +21 CMCs; TW, +7 CMCs), total: +52 CMCs.
- 18 June 2014; *SIM.TF.9.2014* (PE), +4 CMCs.
- 19 June 2014; *EURAMET.AUV.14.2014* (FI), +13 CMCs.
- 23 June 2014; *COOMET.T.10.2014* (UA), +9 CMCs.
- 29 June 2014; *AFRIMETS.L.2.2014* (ZA), +24 CMCs.
- 02 July 2014; *AFRIMETS.QM.13.2014*, *APMP.QM.22.2014*, *COOMET.QM.23.2014* and *EURAMET.QM.25.2014*, total: +193 CMCs (see the details below).
- 15 July 2014; *AFRIMETS.EM.1.2013* (EG), +2 CMCs.
- 21 July 2014; *SIM.EM.7.2014* (AR), -40 CMCs (extensive use of uncertainty tables).
- 21 July 2014; *EURAMET.L.15.2014* (AT, +1 CMC; CH, +4 CMCs; CZ, +0 CMC; DE, +3 CMCs; ES, +3 CMCs; GB, +3 CMCs; IT, +1 CMC; NO, +1 CMC), total: +16 CMCs.
- 25 August 2014; *EURAMET.M.37.2014* (IT, Fluid Flow), -10 CMCs.
- 26 August 2014; *EURAMET.RI.18.2014* (TR, Radioactivity), +3 CMCs.
- 26 August 2014; deletion of CMCs in M (Force): NL, -4 CMCs.

EURAMET.QM.25.2014				APMP.QM.22.2014			
COOMET.QM.23.2014				AFRIMETS.QM.13.2014			
Country	Category	Change	Total	Country	Category	Change	Total
GB	1	1	25	CN	1	17	197
TR	1	15	22	HK	1	1	3
DE	2	1	31	JP	1	3	70
NL	3	4	4	KR	1	1	5
CH	4	1	10	SG	1	3	4
DE	4	-5	82	JP	2	1	27
ES	4	-6	18	CN	3	5	89
FR	4	2	39	AU	4	0	11
GB	4	3	338	TH	4	1	3
HU	4	3	19	AU	5	12	18
NL	4	9	248	CN	4	8	166
PT	4	0	21	JP	4	0	158
SK	4	0	38	KR	4	-5	295
TR	4	1	1	TH	5	3	7
GR	5	1	1	JP	6	0	6
DK	6	1	4	CN	8	2	2
HU	6	2	3	CN	9	4	12
DE	7	1	5	JP	9	1	13
DK	7	1	5	TH	9	1	7
SE	7	1	2	AU	10	3	11
DE	8	1	154	CN	10	17	33
IT	9	2	2	HK	10	1	9
TR	10	4	14	SG	10	4	5
DE	11	1	18	TH	10	0	5
GR	11	4	4	AU	11	3	11
TR	11	2	12	CN	11	8	62
TR	12	1	1	HK	11	2	13
				JP	11	13	111
				SG	11	1	5
RU	1	20	30	TH	11	1	16
BY	4	3	13	CN	12	1	9
RU	4	1	418				
UA	4	3	15	ZA	11	1	5
RU	7	1	3				
RU	11	1	8				

Total: +193 CMCs

*Details of the publication of CMCs in Chemistry
from AFRIMETS, APMP, COOMET and EURAMET on 02 July 2014*

In addition, the KCDB Office has dealt with numerous corrections, such as editorial changes, range and/or uncertainty changes subsequent to results of key comparisons, deletion of

services that are no longer available, and change in the full names of acronyms of laboratories.

1.3. CMCs: temporary removal and re-instatement

The situation regarding temporary removal (“greying-out”) and re-instatement of CMCs is available on-line from page 5 of the [Statistics page of the KCDB](#) (PDF file).

Since 01 March 2014, the following actions have been taken:

- 27 March 2014; re-instatement of 5 CMCs in PR from ZA.
- 15 April 2014; definitive deletion of 16 greyed-out CMCs in QM from CL.
- 02 May 2014; definitive deletion of 3 greyed-out CMCs in M (Pressure) from FR.
- 09 May 2014; greying-out of 3 CMCs in RI (Dosimetry) from TH.
- 09 May 2014; greying-out of 3 CMCs in M (Hardness) from IN.
- 15 May 2014; re-instatement of 3 CMCs in M (Hardness) from IN.

As at 01 September 2014, 129 CMCs were temporarily removed from the KCDB (see table below) against 150 as at 01 March 2014.

As at 01 September 2014, there remained only 1 CMC greyed-out from the KCDB more than five years ago (Mexico, in RI, Neutron measurements). Request was received on 10 January 2014 to keep it in the grey zone over 2014, the time needed to fix-up the Quality System which covers this CMC.

Appropriate action has been taken by Bulgaria in order to re-instate the 1 CMC in Dimensional Metrology that had reached the five-year limit for greyed-out status on 29 June 2014.

The dates of the greying-out of CMCs are kept in the spreadsheet “Dates of CMCs greying-out” of the EXCEL file “CMCsNumber_2014, available from the [access-restricted JCRB CMC website](#) (link “[KCDB statistics](#)”).

	M	PR	EM	T	RI	L	QM	TF	Total
APMP									
NZ			5						5
KR							5 Cat 6		5
TH					3				3
									Total APMP: 13
EURAMET									
BG						1 DimMet			1
BE			30					6	36
FI	3 Torque 3 Force								6
FR	3 FI Flow		3						6
IAEA					1 RI(I)				1
									Total EURAMET: 50
SIM									
MX		3	42		1 RI(III)		1 Cat 2		47
AR						1 DimMet			1
CA		6				11 DimMet			17
US					1 RI(I)				1
									Total SIM: 66
									Total: 129 greyed-out CMCs

*Number of CMCs temporary removed (“greyed-out”) from the KCDB,
by country and by metrology area, as at 01 September 2014*

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

“Future KCDB reports to the JCRB are to include the information on CMC statistics (per RMO) thus avoiding the inclusion of this information in the RMO reports to the JCRB”.

Status as at 01 September 2014

APMP:	6 374 CMCs
COOMET:	2 215 CMCs
EURAMET:	10 767 CMCs
AFRIMETS:	446 CMCs
SIM:	4 819 CMCs
IAEA:	22 CMCs
IRMM:	227 CMCs
WMO:	0 CMCs
ESA:	0 CMCs

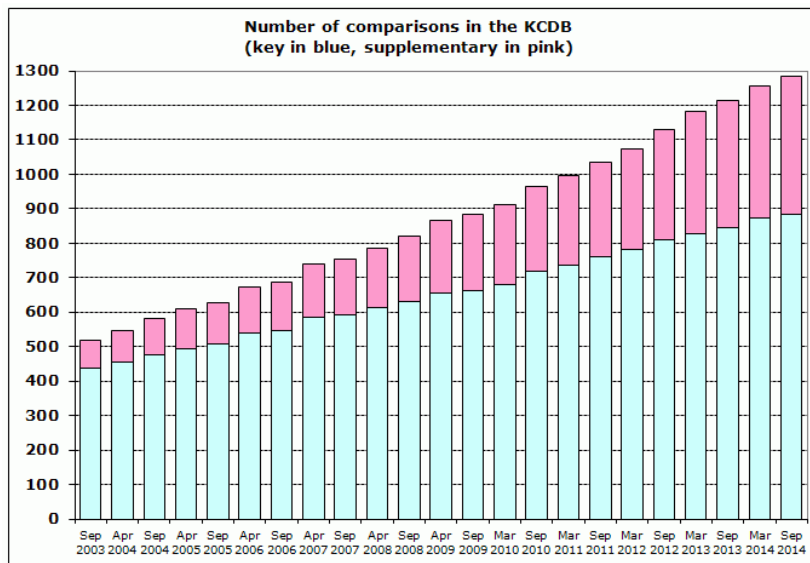
2. Key and supplementary comparisons database

2.1. Content of the database

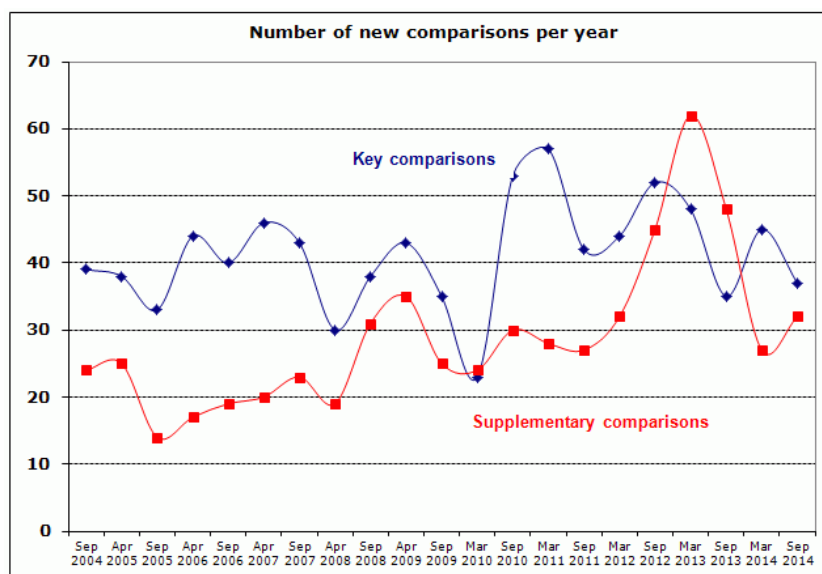
As at 01 September 2014, the database covered 883 key comparisons (87 from the BIPM, 433 from the CCs, 3 from AFRIMETS, 125 from APMP, 41 from COOMET, 142 from EURAMET, and 52 from SIM), and 400 supplementary comparisons.

One new on-going BIPM key comparison in the field of radioactivity ([BIPM.RI\(II\)-K4.F-18](#)) was registered on 23 July 2014.

Graphs showing the evolution since September 2003 of the total number of key comparisons and of supplementary comparisons registered in the KCDB, and the number of new key and supplementary comparisons registered in the KCDB over the one-year period ending at the date indicated on the x-axis are given below.



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



Number of new comparisons registered in the KCDB over the one-year period ending at the date indicated on the x-axis

The average rate of registration of new key comparisons is roughly constant in time at the level of about 40 new key comparisons per year.

One observes a significant decrease in the number of new supplementary comparisons registered over the last 18 months; the rate is now back at its level of about 30 new supplementary comparisons per year observed from 2008 to 2012. This reflects the fact that a number of supplementary comparisons, previously registered in the KCDB, have been cancelled on request from the conducting RMOs as a result of the strategy exercises carried out in 2013, which led to some rationalization.

Updated graphs (PDF files) illustrating the participation in [key](#) and [supplementary](#) comparisons were made available from the [Statistics page of the KCDB](#) on 20 May 2014.

2.2. Key and supplementary comparisons: registration, suppression and modification

Since 01 March 2014, the following actions were taken:

- 04 March 2014; registration of [SIM.QM-K91](#) and [EURAMET.T-S4](#).
- 24 March 2014; registration of [APMP.M.P-S5](#) and [APMP.M.P-S6](#).
- 26 March 2014; registration of [EURAMET.AUV.V-S1](#).
- 31 March 2014; registration of [EURAMET.PR-K6.3](#).
- 01 April 2014; deletion of EURAMET.QM-K16.
- 01 April 2014; registration of [EURAMET.QM-S9](#).
- 07 April 2014; registration of [COOMET.QM-S5](#) and [COOMET.QM-K93](#).
- 08 April 2014; registration of [COOMET.AUV.U-K3](#), [EURAMET.M.F-S4](#) and [COOMET.M.M-S1](#).
- 10 April 2014; registration of [EURAMET.M.P-S14](#).
- 14 April 2014; rename COOMET.T-K9 as [COOMET.T-K3.3](#).
- 18 April 2014; registration of [APMP.T-S13](#) and [CCRI\(II\)-K2.Ge-68](#).
- 22 April 2014; registration of [SIM.T-S6](#).
- 28 April 2014; registration of [SIM.EM-S11](#).
- 19 May 2014; registration of [APMP.RI\(II\)-K2.Fe-59](#).
- 20 May 2014; registration of [EURAMET.EM-S40](#) and [EURAMET.EM-S41](#).
- 21 May 2014; registration of [CCT-K10](#).
- 11 June 2014; registration of [EURAMET.M.M-S8](#).
- 17 June 2014; registration of [COOMET.L-S16](#).
- 24 June 2014; registration of [EURAMET.M.FF-K4.2.2014](#).
- 07 July 2014; registration of [CCQM-K127](#) and [CCQM-K128](#).
- 08 July 2014; registration of [APMP.QM-S2.2015](#).
- 16 July 2014; registration of [COOMET.AUV.A-S2](#) and [APMP.QM-S2.1](#).
- 22 July 2014; registration of [APMP.L-S7](#).
- 23 July 2014; registration of [BIPM.RI\(II\)-K4.F-18](#).
- 08 August 2014; deletion of AFRIMETS.M.M-S2.
- 26 August 2014; deletion of APMP.T-K6.1.

This resulted in an additional 9 key comparisons (11 new key comparison and two deleted) and 19 supplementary comparisons (20 new supplementary comparisons and one deleted) registered in the KCDB over the six-month period covered by this report.

2.3. Published results of key and supplementary comparisons

As at 01 September 2014, among the 883 key comparisons that were registered:

- 88 corresponded to exercises prior to the implementation of the CIPM MRA, and will never have results published in the KCDB; they have been “Approved for provisional equivalence”;
- 77 of the 87 on-going BIPM key comparisons had results published in the KCDB; these are regularly extended as new data become available (15 new results were published since 01 March 2014); and

- another 466 CC and RMO key comparisons had their final reports approved and posted in the KCDB website, and corresponding tables of numbers and graphs entered in the database.

All together, the KCDB currently displays a total of about 2 270 graphs of equivalence, including more than 100 new graphs of equivalence published over the last six months.

The results of 204 RMO key comparisons (compared with 195 at the time of the 32nd JCRB meeting) – 1 conducted by AFRIMETS, 69 by APMP, 27 by COOMET, 86 by EURAMET, and 21 by SIM – are published in the KCDB: see "[Comparisons News](#)" for the list of the most recent publications.

Linkage has also been carried out for 68 bilateral key comparisons subsequent to full-scale CC key comparisons; their results are included in the appropriate graphs of equivalence.

The final reports of 230 of the 400 supplementary comparisons registered in the KCDB were also posted in the KCDB as at 01 September 2014.

All together 67 % of the comparisons registered in the KCDB are ended and have their final reports posted in the KCDB, and also generally published in the [Metrologia Technical Supplement](#). This percentage has now been stable since several years.

3. Visits to the KCDB website

As reported previously, the log-on statistics recorded for the period January – December 2011 indicated that the average number of monthly visits stood at the level of 7 800, and the average number of KCDB web pages opened each month, at the level of 110 000.

These numbers have climbed up to 9 200 and 124 000¹ over 2012, and further to 10 900 and 11 800 for the average number of monthly visits over the year 2013 and the seven first months of 2014, respectively, with a decrease to 90 000 and to 60 500 for the number of KCDB web pages opened each month over these two periods.

As already observed, all pages are equally visited, including the News page and the Statistics page, and PDF files of comparison reports and of CMC lists are regularly downloaded. Visitors come from all over the world, and reach the KCDB website from links proposed in other websites (especially NMI websites), through Internet search engines, but mainly via personal bookmarking, direct URL address typing or using links given in e-mails.

4. The KCDB system

The KCDB web system was not modified over the last six-month period.

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

The following table summarizes the participation of NMIs of Associates of the CGPM in CIPM MRA activities as at 01 September 2014.

¹ These numbers do not include the movements generated by robots.

Associate of the CGPM	Date of becoming an Associate	Date of signature of the CIPM MRA	Total number of published CMCs	Total number of greyed-out CMCs	Date of publication of the first CMC	Number of key comparisons	Number of supplementary comparisons
Albania	10 September 2007	10 October 2007	7	0	05 April 2013	4	2
Bangladesh	29 March 2010	25 March 2011	0	0	-	0	2
Belarus	05 May 2003	14 October 2003	199	0	07 April 2004	32	29
Bolivia	04 April 2008	16 May 2008	0	0	-	4	12
Bosnia and Herzegovina	24 May 2011	15 June 2011	7	0	08 June 2012	6	3
Botswana	30 May 2012	26 July 2012	0	0	-	1	3
CARICOM	10 October 2005	12 October 2005	0	0	-	0	9
Chinese Taipei	26 April 2002	04 June 2002	440	0	21 October 2003	82	39
Costa Rica	29 January 2004	06 October 2004	94	0	26 November 2008	17	20
Cuba	19 December 2000	18 June 2001	96	0	02 May 2005	6	15
Ecuador	20 November 2000	15 April 2001	20	0	16 September 2011	4	15
Estonia	27 January 2005	23 March 2005	4	0	05 May 2014	6	9
Georgia	01 January 2008	17 June 2008	9	0	20 March 2014	4	4
Ghana	17 September 2009	24 February 2010	0	0	-	1	4
Hong Kong (China)	08 April 2000	31 May 2000	360	0	13 December 2000	61	17
Jamaica	15 September 2003	21 July 2004	22	0	24 August 2006	8	7
Latvia	11 January 2001	13 March 2001	59	0	23 March 2005	12	7
Lithuania	12 March 2001	12 April 2001	78	0	11 December 2003	17	14
Macedonia, the FYR of	10 October 2006	14 November 2007	13	0	02 July 2013	4	6
Malta	11 April 2001	20 June 2001	0	0	-	2	3
Mauritius	05 October 2010	09 March 2011	0	0	-	3	2
Moldova, Rep. of	01 January 2007	14 November 2007	40	0	26 September 2013	2	5
Mongolia	07 August 2013	23 October 2013	0	0	-	2	1
Montenegro	01 August 2011	19 October 2011	0	0	-	3	3
Namibia	10 August 2012	16 October 2012	0	0	-	1	2
Panama	03 August 2003	16 September 2003	34	0	11 September 2006	9	14
Paraguay	06 May 2009	27 October 2009	23	0	31 January 2011	2	12
Peru	28 May 2009	17 November 2009	124	0	03 August 2010	13	26
Philippines	01 June 2002	19 December 2002	21	0	18 December 2013	11	5
Seychelles	10 September 2010	12 November 2010	0	0	-	1	1
Slovenia	02 June 2003	23 June 2003	204	0	11 May 2004	36	21
Sri Lanka	03 August 2007	14 November 2007	0	0	-	4	2
Sudan	26 June 2014	26 June 2014	0	0	-	0	1
Syrian Arab Republic	31 May 2012	17 September 2012	0	0	-	10	4
Ukraine	19 August 2002	14 October 2003	219	0	10 January 2005	40	45
Viet Nam	10 October 2003	16 September 2004	31	0	21 July 2010	28	7
Zambia	10 December 2010	3 February 2011	0	0	-	1	3
Zimbabwe	14 September 2010	14 January 2011	0	0	-	1	3

CIPM MRA activity of the NMI of Associates of the CGPM: important dates, number of published CMCs and participation in key and supplementary comparisons

These numbers take into account all comparisons registered in the KCDB, whatever their statuses are, for which at least one laboratory of the Associate is listed in the participants list.

Note:

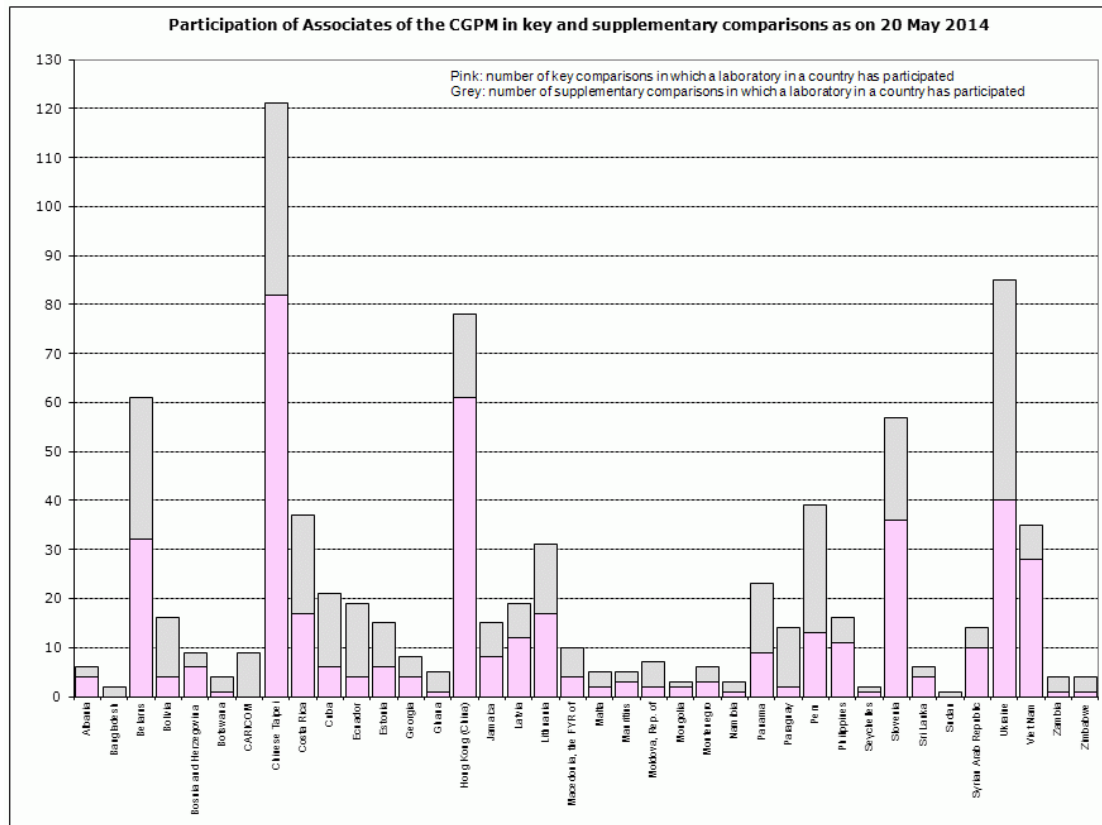
As the numbers on participation in key and supplementary comparisons change only slowly with time, the corresponding KCDB statistics are updated every six months. The numbers given here show the situation as at 20 May 2014. However, as the numbers of CMCs published in the KCDB can vary quickly, they are updated in real-time in all KCDB Statistics files. The numbers of CMCs given here show the situation as at 26 August 2014.

There currently exist [41 Associates of the CGPM](#), but only 38 of them participate in the CIPM MRA (Oman, Luxemburg and Yemen have not yet signed).

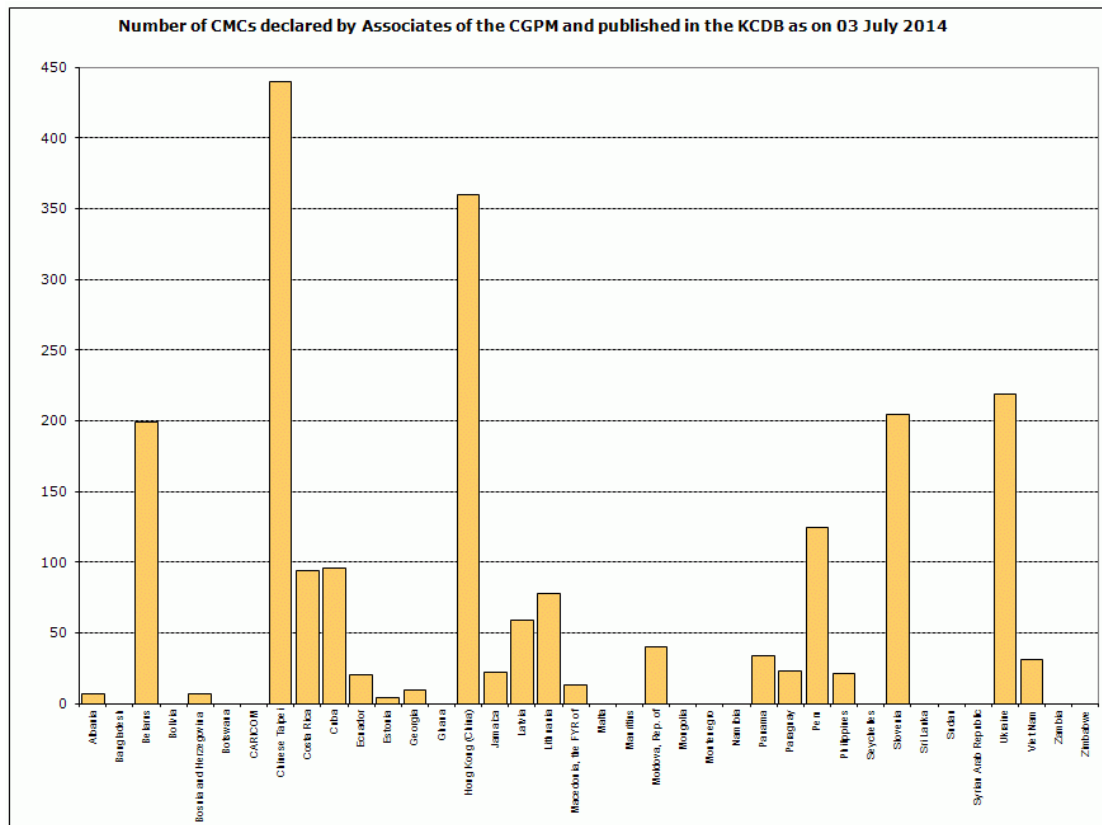
One observes that all of these 38 Associates have at least one of their metrology institutes listed as participant in a key or a supplementary comparison, whereas only 22 of the 38 currently have CMCs published in the KCDB, as shown on the graphs below.

Since last meeting of the JCRB, two Associates have had their first CMCs approved and published: Georgia (9 CMCs in Thermometry on 20 March 2014), and Estonia (26 CMCs in Humidity on 05 May 2014).

It is remarkable that no Associates have CMCs that are currently greyed-out.



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



Graph on the number of CMCs declared by Associates of the CGPM

6. The KCDB and the BIPM QMS

A total number of 11 QMS Procedures cover all the KCDB work: registration of comparisons, publication of comparison results and of CMCs, creation of news, etc. These are always kept up-to-date according to the requirements of the BIPM Quality Manual, and were submitted to an internal audit 23 July 2013. No non-conformities were found and the audit Report contains two positive observations.

Most of the KCDB QMS procedures are kept confidential.