

KCDB REPORT TO THE 32nd JCRB MEETING

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-31/06) was presented at the 31st meeting of the JCRB, held on 18 and 19 September 2013 at NIM, China, and reflected the situation as at 01 September 2013. The present report covers the six-month period from 01 September 2013 to 01 March 2014.

Notes from the KCDB Office to the JCRB members

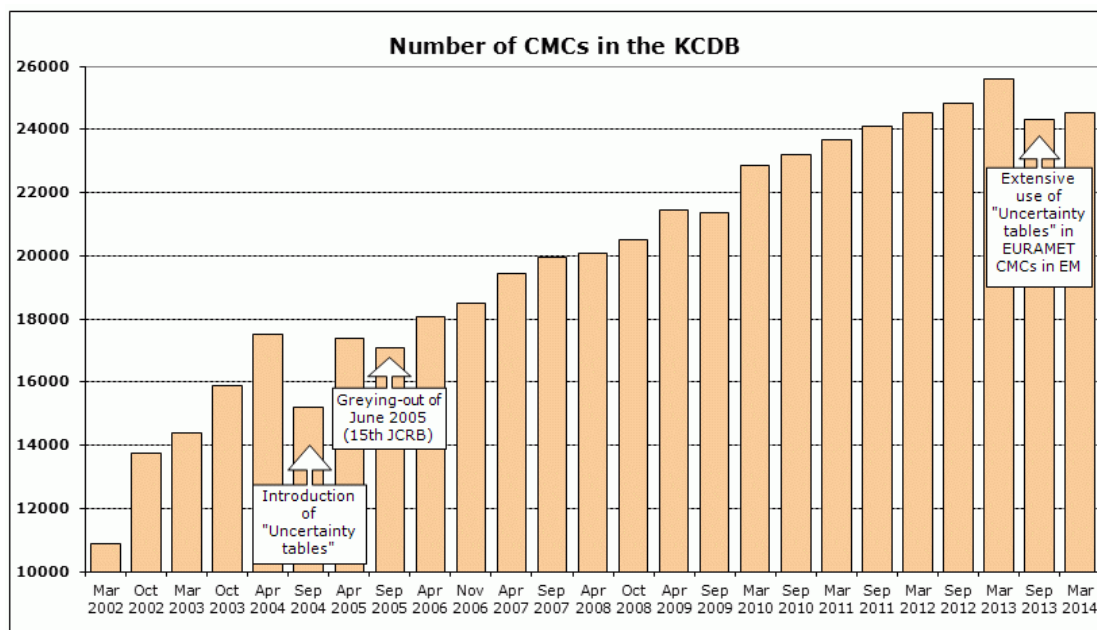
1. Statistics on the content of the KCDB are prepared by the KCDB Office and are available on-line from the [KCDB Statistics page](#). This includes the number of key and supplementary comparisons (updated in real-time), and PDF files showing the participation in key and supplementary comparisons (updated 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 March 2014, the KCDB included a total of 24 521 CMCs:

- 14 981 in General Physics,
- 4 001 in Ionizing Radiation, and
- 5 539 in Chemistry.



Number of CMCs registered in the KCDB since March 2002

Over the period covered by this Report, 33 newly approved sets of CMCs were published (see Section 1.2 below), corresponding to an additional 250 CMCs. 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](#)”

Since 01 September 2013, the following sets of CMCs have been published in the KCDB:

- 09 September 2013; *EURAMET.RI.13.2013* (IAEA), +9 CMCs (and 1 CMC greyed-out).
- 24 September 2013; *SIM.RI.9.2013* (BR, Neutron Measurements), +13 CMCs.
- 24 September 2013; *SIM.RI.11.2013* (US, Dosimetry), -1 CMC (greyed-out).
- 26 September 2013; *COOMET.T.8.2013* (BY, +10 CMCs; CU, +8 CMCs; KZ, +5 CMCs; UA, +11 CMCs; and MD, +40 CMCs: **first set of CMCs from Moldova published in the KCDB**); total: +74 CMCs.
- 26 September 2013; *APMP.T.8.2013* (KR, +10 CMCs).
- 26 September 2013; *APMP.T.9.2013* (TH, +8 CMCs).
- 26 September 2013; *EURAMET.T.13.2013* and *EURAMET.T.14.2013* (DE, +15 CMCs; ES, +3 CMCs; FR, +4 CMCs); total: +22 CMCs.
- 26 September 2013; *AFRIMETS.T.4.2013* (ZA, +1 CMC).
- 02 October 2013; *EURAMET.RI.16.2013* (RO, Radioactivity, +3 CMCs).
- 04 October 2013; *EURAMET.RI.15.2012* (FR, Dosimetry, +19 CMCs).
- 06 October 2013; *SIM.L.10.2013* (BR, +0 CMCs; and UY, +1 CMC); total: +1 CMC.
- 10 October 2013; re-publication of 15 CMCs in EM from FI that had been accidentally forgotten in August 2013.
- 11 October 2013; *SIM.RI.10.2012* (AR, Radioactivity, +10 CMCs).
- 18 October 2013; *EURAMET.M.35.2013* (GB, Fluid Flow, -32 CMCs; DK, Fluid Flow, -5 CMCs; PL, Fluid Flow, -4 CMCs; and TR, Fluid Flow, -1 CMC); total: -42 CMCs.
- 31 October 2013; *SIM.PR.6.2013* (CA, +2 CMCs).

- 04 November 2013; *APMP.L.22.2013* (KR, +13 CMCs; and HK, +3 CMCs); total: +16 CMCs.
- 25 November 2013; *APMP.M.34.2013* (CN, Fluid Flow, +12 CMCs).
- 06 December 2013; *APMP.EM.8.2013* (AU, +6 CMCs; CN, +22 CMCs; TH, +2 CMCs; IN, +11 CMCs; and JP, -16 CMCs); total: +25 CMCs.
- 12 December 2013; *COOMET.PR.8.2013* (RU, +6 CMCs).
- 17 December 2013; *COOMET.QM.22.2013* (RU, Cat 11, +0 CMCs).
- 17 December 2013; *EURAMET.QM.24.2013* (FR, Cat 11, +1 CMC; and GB, Cat 11, +1 CMC); total: +2 CMCs.
- 18 December 2013; *APMP.M.33.2013* (PH, +21 CMCs, **first set of CMCs from Philippines published in the KCDB**).
- 20 December 2013; *APMP.QM.21.2013* (TH, Cat 11, +1 CMC; KR, Cat 4, +0 CMC; CN, Cat 11, +13 CMCs; JP, Cat 11, +0 CMCs; and KR, Cat 11, +3 CMCs); total: +17 CMCs.
- 20 December 2013; *SIM.QM.17.2013* (PE, Cat 2, +3 CMCs; AR, Cat 11, +0 CMCs; BR, Cat 11, +0 CMCs; CA, Cat 11, +0 CMCs; MX, Cat 11, -1 CMC; and US, cat 11, -98 CMCs); total: -96 CMCs.
- 23 December 2013; *COOMET.EM.6.2013* (BY, +27 CMCs).
- 10 January 2014; *APMP.M.35.2013* (JP, Fluid Flow, -13 CMCs).
- 21 January 2014; *SIM.T.8.2013* (CA, +0 CMCs).
- 27 January 2014; *COOMET.M.17.2013* (BY, Hardness, +1 CMC).
- 28 January 2014; *COOMET.M.15.2013* (RU, Fluid Flow, +2 CMCs).
- 28 January 2014; *AFRIMETS.M.4.2013* (EG, Torque, +1 CMC).
- 19 February 2014; *COOMET.M.19.2013* (UA, Hardness, +1 CMC).
- 26 February 2014; *EURAMET.AUV.13.2013* (FR, Acoustics, -1 CMC).
- 27 February 2014; *EURAMET.AUV.12.2013* (RS, Acoustics, +12 CMCs).

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 September 2013, the following actions have been taken:

- 09 September 2013; greying-out of one CMC in RI (Dosimetry) from IAEA.
- 24 September 2013; greying-out of one CMC in RI (Dosimetry) from US, following publication of the set *SIM.RI.11.2013*.
- 11 October 2013; definitive deletion of 66 greyed-out CMCs in RI (Radioactivity) from AR, following the publication of the set *SIM.RI.10.2012*.
- 26 December 2013; re-instatement of 21 CMCs in EM (Resistance) from MX.
- 06 February 2014; re-instatement of 45 CMCs in RI (Radioactivity) from MX.

As at 01 March 2014, 150 CMCs were temporarily removed from the KCDB (see table below) against 280 as at 01 September 2013.

As at 01 March 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.

This information is 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](#)").

Distribution of CMCs that are temporarily removed ("greyed-out") from the KCDB

	M	PR	EM	T	RI	L	QM	TF	Total
APMP									
NZ			5						5
KR							5 Cat 6		5
									Total APMP: 10
AFRIMETS									
ZA		5							5
									Total AFRIMETS: 5
EURAMET									
BG						1 DimMet			1
BE			30					6	36
FI	3 Torque 3 Force								6
FR	3 Pressure 3 FI Flow		3						9
IAEA					1 RI(I)				1
									Total EURAMET: 53
SIM									
MX		3	42		1 RI(III)		1 Cat 2		47
AR						1 DimMet			1
CL							16		16
CA		6				11 DimMet			17
US					1 RI(I)				1
									Total SIM: 82
Total: 150 greyed-out CMCs									

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

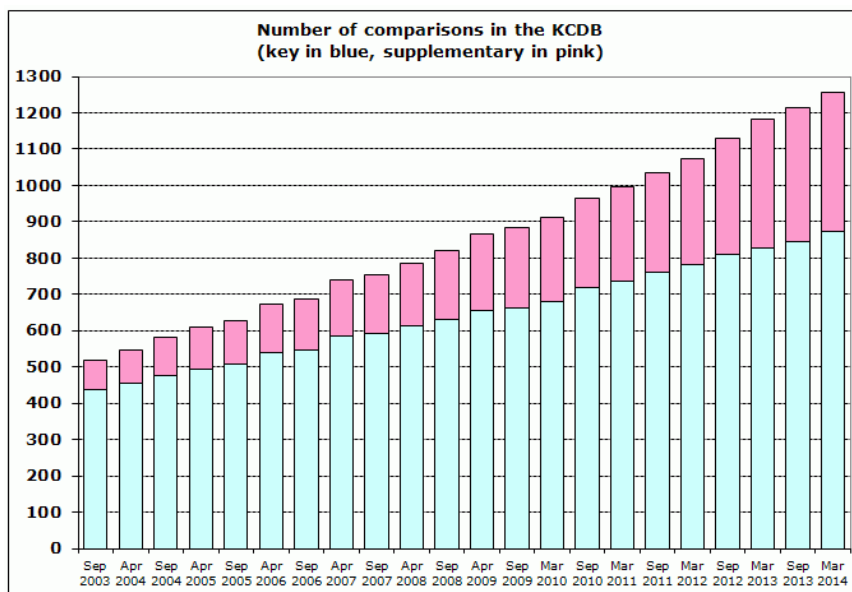
APMP: 6 195 CMCs
COOMET: 2 144 CMCs
EURAMET: 10 673 CMCs
AFRIMETS: 412 CMCs
SIM: 4 848 CMCs
IAEA: 22 CMCs
IRMM: 227 CMCs
WMO: 0 CMCs

2. Key and supplementary comparisons database

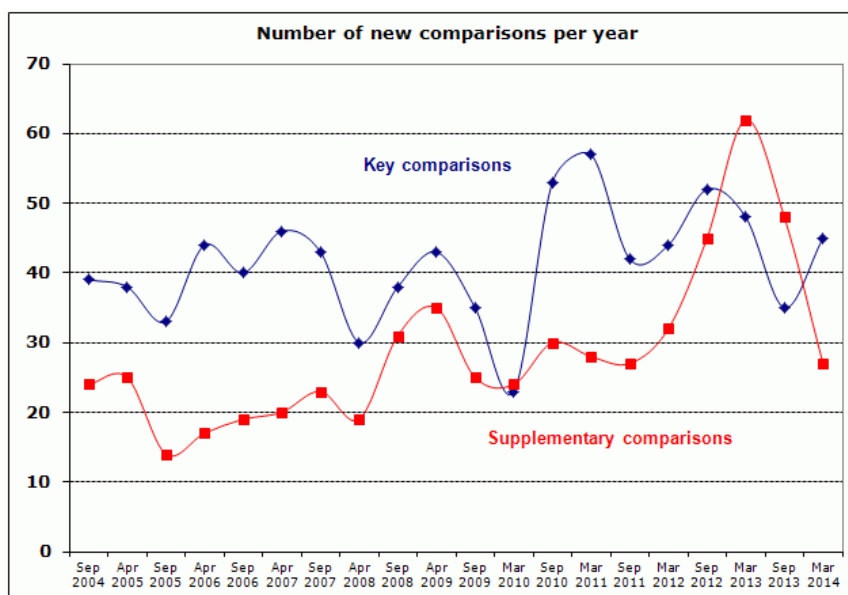
2.1. Content of the database

As at 01 March 2014, the database covered 874 key comparisons (86 from the BIPM, 429 from the CCs, 3 from AFRIMETS, 125 from APMP, 39 from COOMET, 141 from EURAMET, and 51 from SIM), and 381 supplementary comparisons.

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, but we observe a significant decrease in the number of new supplementary comparisons registered over the last year in the KCDB. This reflects the fact that 11 supplementary comparisons, previously registered in the KCDB, have been deleted over the last months, on request from the conducting RMOs. This may be linked to the strategy exercises recently carried out.

Updated graphs (PDF files) illustrating the participation in [key](#) and [supplementary](#) comparisons were made available from the [Statistics page of the KCDB](#) on 18 November 2013.

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

Since 01 September 2013, the following actions were taken:

- 04 September 2013; registration of [EURAMET.M.FF-S6](#).
- 05 September 2013; registration of [SIM.M.M-S14](#).
- 09 September 2013; registration of [SIM.T-S5](#).
- 13 September 2013; registration of [APMP.EM-K12](#).
- 17 September 2013; registration of [SIM.M.F-S5](#).
- 16 October 2013; registration of [EURAMET.AUV.A-S2](#).
- 17 October 2013; registration of [CCQM-K116](#).
- 21 October 2013; registration of [EURAMET.EM-S39](#).
- 29 October 2013; registration of [APMP.RI\(I\)-K3.2013](#).
- 12 November 2013; deletion of SADC MET.L-S1.
- 12 November 2013; deletion of SADC MET.L-S2.
- 15 November 2013; registration of [CCAUV.V-K3](#).
- 15 November 2013; EURAMET.AUV.V-S1 upgraded in [EURAMET.AUV.V-K3](#).
- 15 November 2013; APMP.AUV.V-S1 upgraded in [APMP.AUV.V-K3](#).
- 15 November 2013; registration of [CCAUV.U-K3.1](#).
- 18 November 2013; deletion of APMP.EM-K10.
- 18 November 2013; deletion of APMP.EM-K8.
- 10 December 2013; registration of [APMP.QM-K19](#).
- 10 December 2013; registration of [CCQM-K55.d](#).
- 10 December 2013; registration of [CCQM-K95.1](#).
- 10 December 2013; registration of [CCQM-K117](#).
- 10 December 2013; registration of [CCQM-K118](#).
- 10 December 2013; registration of [CCQM-K119](#).
- 10 December 2013; registration of [CCQM-K120](#).
- 10 December 2013; registration of [CCQM-K121](#).
- 10 December 2013; registration of [CCQM-K122](#).
- 10 December 2013; registration of [CCQM-K123](#).
- 10 December 2013; registration of [CCQM-K124](#).
- 10 December 2013; registration of [CCQM-K125](#).
- 10 December 2013; registration of [CCQM-K126](#).
- 10 December 2013; registration of [SIM.QM-S3](#).
- 10 December 2013; registration of [SIM.QM-S4](#).
- 10 December 2013; registration of [COOMET.QM-S4](#).
- 10 December 2013; registration of [EURAMET.M.F-S3](#).
- 18 December 2013; registration of [CCAUV.W-K2](#).
- 23 December 2013; registration of [COOMET.L-S13](#).
- 23 December 2013; registration of [COOMET.L-S14](#).
- 23 December 2013; registration of [COOMET.L-S15](#).
- 26 December 2013; registration of [COOMET.EM-S17](#).
- 06 January 2014; registration of [EURAMET.M.M-S7](#).
- 09 January 2014; registration of [EURAMET.L-K4.2005.1](#).
- 17 January 2014; registration of [CCPR-K3.2014](#).
- 23 January 2014; registration of [COOMET.M.P-S1](#).
- 24 January 2014; registration of [COOMET.M.H-K3](#).
- 27 January 2014; registration of [EURAMET.M.P-S13](#).

- 30 January 2014; registration of [SIM.T-K9.1](#).
- 03 February 2014; registration of [COOMET.T-K9](#).
- 06 February 2014; registration of [EURAMET.EM.BIPM-K10.b](#).
- 06 February 2014; deletion of COOMET.T-S5 and registration of [COOMET.T-K5](#).
- 18 February 2014; deletion of COOMET.L-S11.
- 18 February 2014; registration of [EURAMET.M.FF-K6](#).
- 19 February 2014; registration of [APMP.PR-K2.b](#).
- 20 February 2014; registration of [COOMET.T-S1](#).
- 27 February 2014; registration of [EURAMET.RI\(II\)-S7.Sm-151](#).

This resulted in an additional 28 key comparisons (30 new key comparison and two deleted) and 13 supplementary comparisons (19 new supplementary comparisons and 6 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 March 2014, among the 874 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 86 on-going BIPM key comparisons had results published in the KCDB; these are regularly extended as new data become available (20 new results were published since 01 September 2013); and
- another 448 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 2 160 graphs of equivalence, including more than 50 new graphs of equivalence published over the last six months.

The results of 195 RMO key comparisons (compared with 180 at the time of the 31st JCRB meeting) – 1 conducted by AFRIMETS (first results of an AFRIMETS key comparison, [AFRIMETS.QM-K27](#), having been made available on 2 October 2013), 66 by APMP, 26 by COOMET, 82 by EURAMET, and 20 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 66 bilateral key comparisons subsequent to full-scale CC key comparisons; their results are included in the appropriate graphs of equivalence.

The final reports of 214 of the 381 supplementary comparisons registered in the KCDB were also posted in the KCDB as at 01 March 2014.

All together 66 % 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 for the average number of monthly visits over the year 2013, with a slight decrease to 90 000 for the number of KCDB web pages.

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.

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

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, except that a pop-in inquiry on the users of the KCDB was installed on the KCDB website on 24 January 2014. The first results of this inquiry are reported in Document JCRB-32/06.1.

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 March 2014.

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	1
Bangladesh	29 March 2010	25 March 2011	0	0	-	0	2
Belarus	05 May 2003	14 October 2003	196	0	07 April 2004	29	26
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	5	2
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	433	0	21 October 2003	80	39
Costa Rica	29 January 2004	06 October 2004	86	0	26 November 2008	17	18
Cuba	19 December 2000	18 June 2001	96	0	02 May 2005	6	14
Ecuador	20 November 2000	15 April 2001	20	0	16 September 2011	4	14
Estonia	27 January 2005	23 March 2005	0	0	-	6	9
Georgia	01 January 2008	17 June 2008	0	0	-	3	2
Ghana	17 September 2009	24 February 2010	0	0	-	1	4
Hong Kong (China)	08 April 2000	31 May 2000	353	0	13 December 2000	62	17
Jamaica	15 September 2003	21 July 2004	22	0	24 August 2006	8	6
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	16	12
Macedonia, the FYR of	10 October 2006	14 November 2007	13	0	02 July 2013	4	5
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	4
Mongolia	07 August 2013	23 October 2013	0	0	-	2	1
Montenegro	01 August 2011	19 October 2011	0	0	-	3	2
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	113	0	03 August 2010	12	25
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	199	0	11 May 2004	35	21
Sri Lanka	03 August 2007	14 November 2007	0	0	-	4	2
Syrian Arab Republic	31 May 2012	17 September 2012	0	0	-	10	4
Ukraine	19 August 2002	14 October 2003	193	0	10 January 2005	35	40
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 NMIs 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:

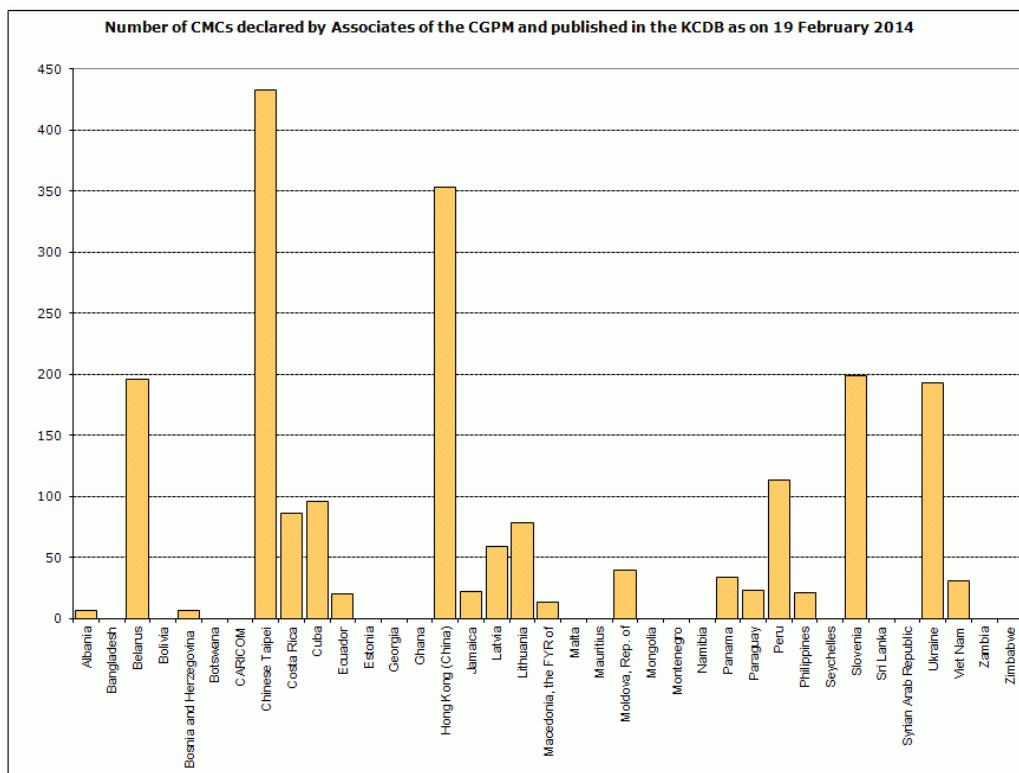
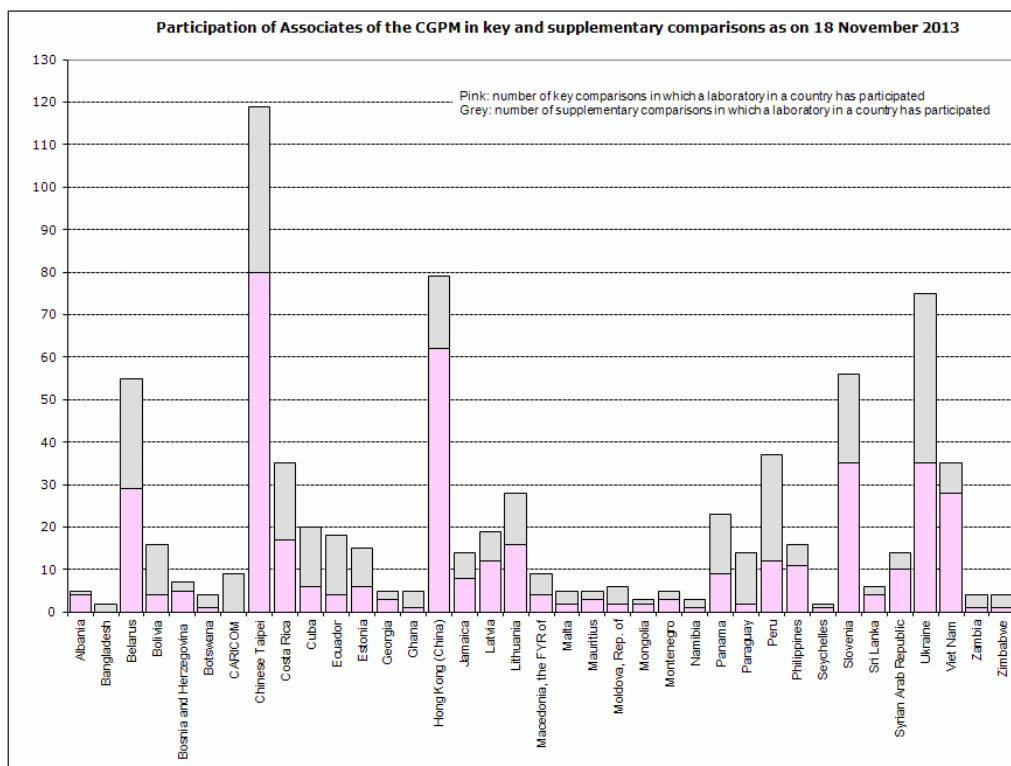
As the numbers on participation in key and supplementary comparisons change only slowly with time, the corresponding KCDB statistics are updated every six months. The numbers given here show the situation as at 18 November 2013. However, as the numbers of CMCs published in the KCDB can vary quickly, they are updated in real-time in all KCDB Statistics files. The numbers of CMCs given here show the situation as at 27 February 2014.

There currently exist [39 Associates of the CGPM](#), but only 37 of them participate in the CIPM MRA (Oman and Luxemburg have not yet signed).

One observes that all of these 37 Associates have at least one of their metrology institutes listed as participant in a key or a supplementary comparison, whereas only 20 of the 37 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: Moldova (40 CMCs in Thermometry on 26 September 2013), and Philippines (21 CMCs in Mass Standards on 18 December 2013).

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



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.