

## KCDB REPORT TO THE 30th 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-29/06) was presented at the 29th meeting of the JCRB, held on 25 - 26 September 2012 at NIST in Gaithersburg, United States, and reflected the situation as at 01 September 2012. The present report covers the six-month period from 01 September 2012 to 01 March 2013.

### Notes from the KCDB Office to the JCRB members

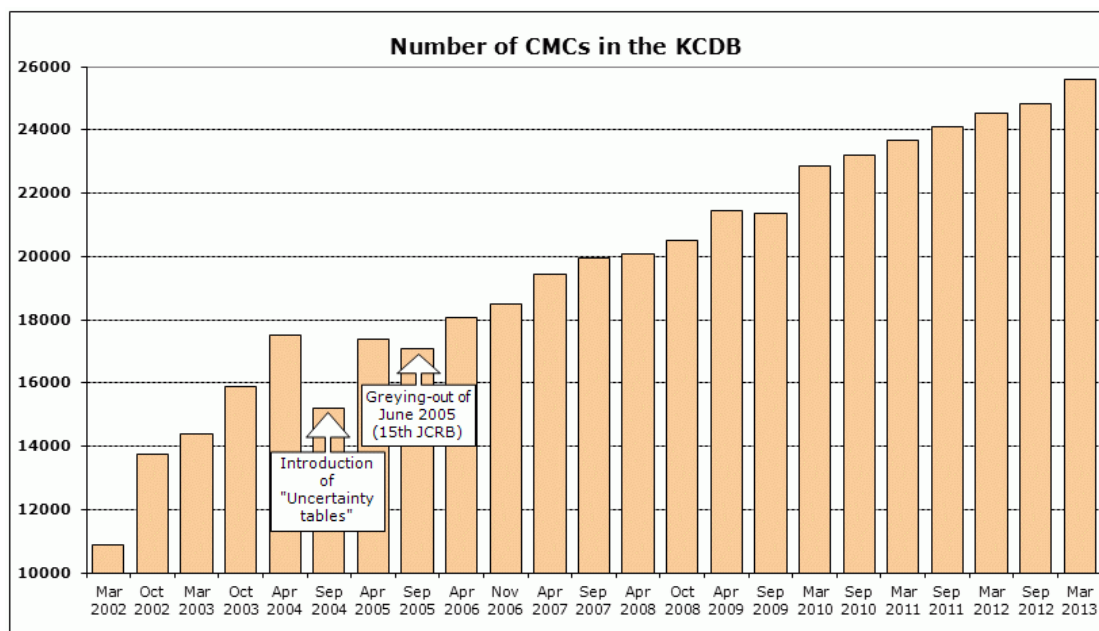
1. Statistics on the content of the KCDB are prepared by the KCDB Office and are available on-line from the [KCDB Statistics page](#). This includes the number of key and supplementary comparisons (updated in real-time), and PDF files showing the participation in key and supplementary comparisons (updated 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 2013, the KCDB included a total of 25 591 CMCs:

- 16 331 in General Physics,
- 3 900 in Ionizing Radiation, and
- 5 360 in Chemistry.



*Number of CMCs registered in the KCDB since March 2002*

Over the period covered by this Report, 31 newly approved sets of CMCs were published (see Section 1.2 below), corresponding to an additional 757 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 2012, the following sets of CMCs have been published in the KCDB:

- 06 September 2012; AFRIMETS.QM.10.2012 (ZA, Cat 4); +15 CMCs.
- 06 September 2012; COOMET.QM.19.2012 (RU, Cat 4); +13 CMCs.
- 08 September 2012; SIM.QM.14.2012 (CA, Cat 1; CA, Cat 11; BR, Cat 3; BR, Cat 4; BR, Cat 13; CL, Cat 10); +59 CMCs.
- 14 September 2012; APMP.QM.18.2012 (AU, Cat 3; AU, Cat 10; JP, Cat 1; KR, Cat 1; CN, Cat 3; JP, Cat 3; IN, Cat 4; KR, Cat 9; HK, Cat 9; TH, Cat 9; CN, Cat 9; AU, Cat 11; TH, Cat 11; HK, Cat 11; JP, Cat 13; JP, Cat 4; CN, Cat 10; JP, Cat 11; KR, Cat 10; KR, Cat 11; CN, Cat 4); +194 CMCs.
- 21 September 2012; EURAMET.QM.21.2012 (DE, Cat 3; GB, Cat 3; FR, Cat 4; GB, Cat 4; PL, Cat 4; SE, Cat 7; RO, Cat 8; DE, Cat 10; GB, Cat 10; DE, Cat 11; TR, Cat 11; DE, Cat 13); +70 CMCs.
- 25 September 2012; SIM.M.22.2012 (BR); +1 CMC.
- 04 October 2012; COOMET.PR.5.2011 (RU); +40 CMCs.
- 05 October 2012; EURAMET.T.11.2012 (IT); +2 CMCs.
- 08 October 2012; EURAMET.M.26.2012 (CZ); +0 CMCs.
- 09 October 2012; EURAMET.M.27.2012 (SI and RS); +17 CMCs.
- 10 October 2012; APMP.L.21.2011 (CN); +36 CMCs.
- 12 October 2012; EURAMET.L.11.2012 (DE, ES, FI, GB, HR, IE, NL, PL and PT); +26 CMCs.
- 26 October 2012; SIM.EM.6.2012 (PE and MX); +92 CMCs (but 63 CMCs from MX were also greyed-out on the same date).
- 15 November 2012; COOMET.L.9.2012 (KZ); +3 CMCs.

- 24 November 2012; EURAMET.M.28.2012 (Fluid Flow) (AT, DE, HU, FR and CH); - 21 CMCs (but 3 CMCs from FR were also greyed-out on the same date).
- 28 November 2012; SIM.L.7.2011 (AR); +6 CMCs.
- 07 December 2012; APMP.PR.9.2012 (NZ and TW); +13 CMCs.
- 08 December 2012; EURAMET.L.12.2012 (DK); +7 CMCs.
- 19 December 2012; EURAMET.RI.14.2012 (DE); +1 CMC.
- 27 December 2012; EURAMET.M.29.2012 (Fluid Flow) (CZ, LT, NL, FI, SE and SK); -13 CMCs.
- 07 January 2013; SIM.L.9.2012 (PE); +1 CMC.
- 11 January 2013; APMP.AUV.10.2012 (TH); +18 CMCs.
- 14 January 2013; APMP.T.7.2013 (VN); SIM.T.7.2013 (CA, CR, PE and US); and EURAMET.T.12.2013 (AT, BE, CZ, DE, DK, ES, FR, GR, HR, HU, IE, IT, LT, NL, NO, PL, PT, RO, RS, SE, SI, SK and GB); +213 CMCs.
- 08 February 2013; APMP.TF.11.2012 (CN); +0 CMCs.
- 14 February 2013; 1st part of EURAMET.EM.8.2012 (BG, ES, FI, FR, GR, IT, PL and SK); +8 CMCs (but 1 CMC from IT was also greyed-out on the same date).
- 15 February 2013; APMP.TF.12.2012 (KR); +1 CMC.
- 25 February 2013; COOMET.TF.6.2012 (UA); +13 CMCs.
- 26 February 2013; COOMET.PR.6.2012 (RU); +3 CMCs; and EURAMET.L.13.2012 (RO, HR and ES); +8 CMCs.
- 28 February 2013; 2nd part of EURAMET.EM.8.2012 (HR, RS, GB, CZ, CH and SE); +40 CMCs. (*This set of CMCs also covers the file from Germany, which is not yet published at the time of writing this report*).

In addition, the KCDB Office has dealt with numerous corrections:

- Editorial changes.
- Range and/or uncertainty changes subsequent to results of key comparisons.
- Deletion of services that are no longer available [on 01 February 2013, DE (RI, Dosimetry) -3 CMCs].
- Change in the full name of METAS (Federal Institute of Metrology, Switzerland (03 January 2013)).

### 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 2012, the following actions have been taken:

- 26 October 2012; greying-out of 63 CMCs in EM (Low Frequencies) and definitive deletion of 1 CMC in EM (Radio Frequencies) greyed-out in June 2005, from Mexico (set of CMCs SIM.EM.6.2012);
- 24 November 2012; greying-out of 3 CMCs in Fluid Flow from France (set of CMCs EURAMET.M.28.2012).
- 28 November 2012; greying-out of 1 CMC in L from Argentina.
- 04 February 2013; greying-out of all CMCs in TF (6 CMCs) and in EM (58 CMCs) from Belgium (change of staff).
- 14 February 2013; greying-out of 1 CMC in EM from Italy (set of CMCs EURAMET.EM.8.2012).
- 21 February 2013; re-instatement of 3 CMCs in PR from Canada.
- 23 February 2013; re-instatement of 22 CMCs in M (Mass Standards) from Jamaica.

As at 01 March 2013, 295 CMCs were temporarily removed from the KCDB (see table below) against 189 as at 01 September 2012.

As at 01 March 2013, there remained only 1 CMC greyed-out from the KCDB more than five years ago (Mexico, in RI, Neutron measurements).

This information is kept in the spreadsheet "Dates of CMCs greying-out" of the EXCEL file "CMCsNumber\_2012, available from the [access-restricted JCRB CMC website](#) (link "[KCDB statistics](#)").

	M	PR	EM	T	RI	L	QM	TF	Total
<b>APMP</b>									
NZ			5						5
KR							5 Cat 6		5
									<b>Total APMP: 10</b>
<b>AFRIMETS</b>									
ZA		5							5
									<b>Total AFRIMETS: 5</b>
<b>EURAMET</b>									
BG						1 DimMet			1
BE			58					6	64
IT			1						1
FI	3 Torque 3 Force								6
FR	3 Pressure 3 FI Flow								6
									<b>Total EURAMET: 78</b>
<b>SIM</b>									
MX		3	63		46 45 RI(II) & 1 RI(III)		6 Cat 2		118
AR					66 RI(II)	1 DimMet			67
CA		6				11 DimMet			17
									<b>Total SIM: 202</b>
									<b>Total: 295 CMCs deleted</b>

*Number of CMCs temporary removed ("greyed-out") from the KCDB,  
by country and by metrology area, as at 01 March 2013*

**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 2013

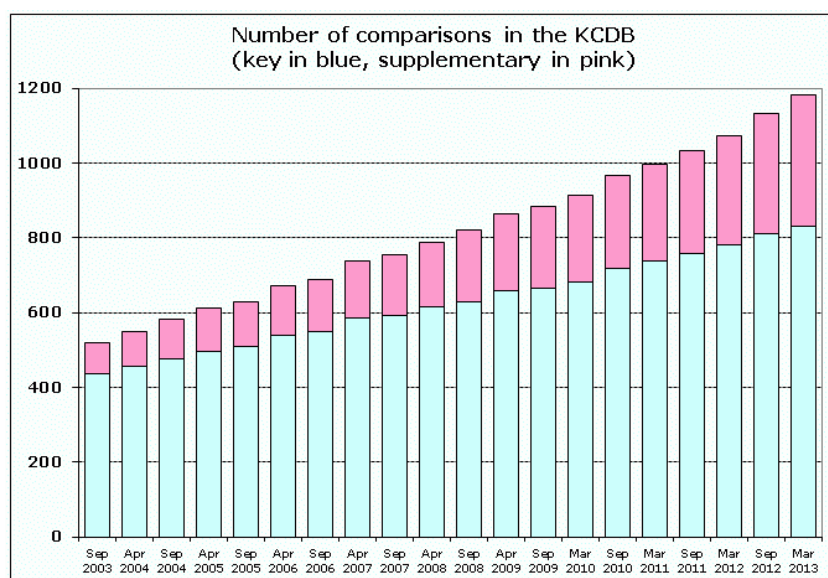
APMP: 5 934 CMCs  
COOMET: 1 971 CMCs  
EURAMET: 12 171 CMCs  
AFRIMETS: 408 CMCs  
SIM: 4 847 CMCs  
IAEA: 13 CMCs  
IRMM: 247 CMCs  
WMO: 0 CMCs

## 2. Key and supplementary comparisons database

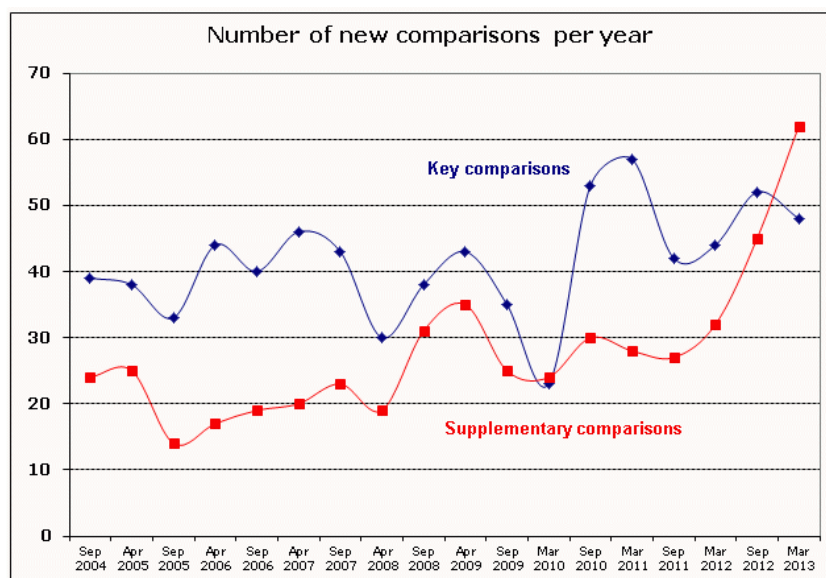
### 2.1. Content of the database

As at 01 March 2013, the database covered 829 key comparisons (86 from the BIPM, 406 from the CCs, 3 from AFRIMETS, 117 from APMP, 37 from COOMET, 132 from EURAMET, and 48 from SIM), and 354 supplementary comparisons (including the first BIPM supplementary comparison [BIPM.RI\(I\)-S1](#) registered on 28 January 2013).

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 now constant in time, but we observe a significant increase in the number of new supplementary comparisons registered each year in the KCDB. This may be due to the need of organizing regional exercises involving the NMI of new Associates of the CGPM.

Updated graphs (PDF files) illustrating the participation in [key](#) and [supplementary](#) comparisons were made available from the [Statistics page of the KCDB](#) on 20 November 2012.

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

Since 01 September 2012, the following actions were taken:

- 24 September 2012; registration of [CCQM-K110](#).
- 16 September 2012; registration of [SIM.M.M-S13](#).
- 19 September 2012; registration of [CCT-K4.1](#).
- 21 September 2012; registration of [EURAMET.M.M-S5](#).
- 22 September 2012; registration of [APMP.PR-S6](#).
- 27 September 2012; registration of [SIM.EM-K4.1](#) and [SIM.EM-S11](#).
- 01 October 2012; transformation of COOMET.T-S1 in [COOMET.T-K3.1](#).
- 02 October 2012; registration of [COOMET.T-K3.2](#).
- 09 October 2012; registration of [EURAMET.M.M-S6](#).
- 12 October 2012; deletion of SIM.RI(I)-K3.1.
- 26 October 2012; registration of [CCM.V-K3.A](#), [CCM.V-K3.B](#) and [CCM.V-K3.C](#).
- 31 October 2012; registration of [EURAMET.M.D-S1](#).
- 02 November 2012; registration of [APMP.T-S9](#).
- 09 November 2012; registration of [APMP.T-S10](#).
- 12 November 2012; registration of [APMP.T-K6.1](#).
- 14 November 2012; registration of [SIM.M.FF-S7](#).
- 20 November 2012; registration of [COOMET.EM-S13](#).
- 26 November 2012; registration of [APMP.EM-S13](#), [APMP.EM-S14](#) and [SIM.M.F-S4](#).
- 28 November 2012; registration of [APMP.T-K3.6](#) and [APMP.T-K4.1](#).
- 05 December 2012; registration of [SIM.EM-K6.1](#) and [SIM.EM-K9.1](#).
- 06 December 2012; deletion of APMP.T-K3.2 and registration of [COOMET.EM-K6.a](#).
- 11 December 2012; registration of [COOMET.PR-S6](#).
- 12 December 2012; registration of [AFRIMETS.AUV.A-S1](#).
- 13 December 2012; registration of [CCAUV.V-S1](#).
- 14 December 2012; registration of [APMP.M.P-S4](#).
- 09 January 2013; registration of [EURAMET.M.P-S12](#).
- 11 January 2013; registration of [EURAMET.L-K8.2013](#).
- 14 January 2013; registration of [EURAMET.RI\(I\)-S11](#).
- 15 January 2013; registration of [CCM.G-K2](#).
- 16 January 2013; registration of [EURAMET.T-K1](#).
- 28 January 2013; registration of [COOMET.EM-S14](#) and [BIPM.RI\(I\)-S1](#).
- 29 January 2013; registration of [COOMET.EM-S15](#).
- 06 February 2013; registration of [COOMET.EM-S16](#).
- 08 February 2013; registration of [APMP.EM-K5.1](#).
- 12 February 2013; registration of [COOMET.L-S11](#) and [COOMET.L-S12](#).
- 14 February 2013; registration of [EURAMET.QM-S6](#), [EURAMET.L-S22](#), [AFRIMETS.M.M-S3](#) and [AFRIMETS.M.P-S1](#).
- 19 February 2013; registration of [AFRIMETS.T-S4](#) and [EURAMET.EM-S37](#).
- 20 February 2013; registration of [EUROMET.M.FF-S5](#), [APMP.EM.RF-S21.F](#) and [EURAMET.EM-S38](#).
- 22 February 2013; registration of [APMP.M.P-K14](#) and [EURAMET.M.F-S2](#).
- 26 February 2013; registration of [EURAMET.T-K3.5](#).

This resulted in an additional 18 key comparisons and 34 supplementary comparisons 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 2013, among the 829 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”;
- 75 of the 88 on-going BIPM key comparisons had results published in the KCDB; these are regularly extended as new data become available (12 new results were published since 01 September 2012); and
- another 408 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 1 950 graphs of equivalence, including more than 80 new graphs of equivalence published over the last six months.

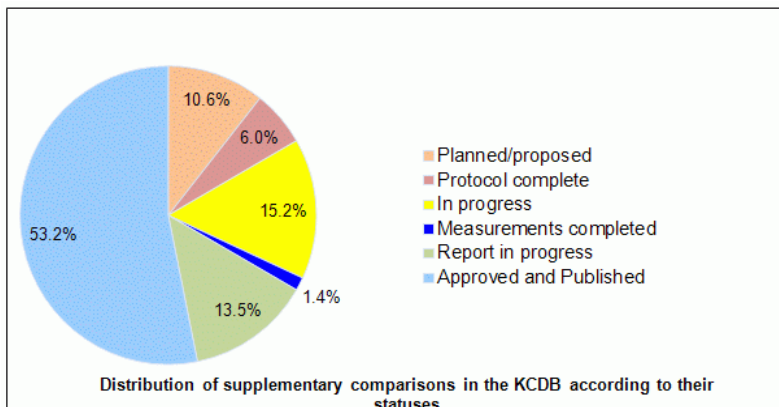
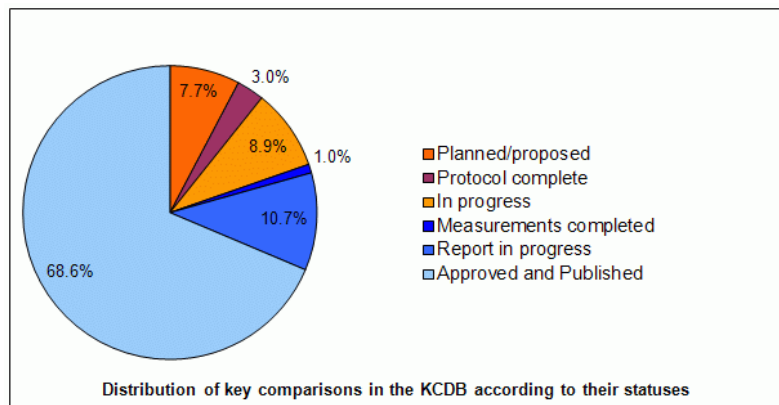
The results of 172 RMO key comparisons (compared with 163 at the time of the 29th JCRB meeting) - 59 conducted by APMP, 20 by COOMET, 77 by EURAMET, and 16 by SIM - are published in the KCDB: see [“Comparisons News”](#) for the list of the most recent publications.

Linkage has also been carried out for 53 bilateral key comparisons subsequent to full-scale CC key comparisons; their results are included in the appropriate graphs of equivalence.

The final reports of 187 of the 354 supplementary comparisons registered in the KCDB were also posted in the KCDB as at 01 March 2013.

All together 64 % 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.

The two following graphs show the distribution of the key and supplementary comparisons registered in the KCDB according their statuses as at 18 February 2013.



### 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 124 000<sup>1</sup> over 2012.

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 and publicity

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

The [tutorial presentation on the KCDB](#) posted in the page “[Reports on the KCDB](#)” of the BIPM web site was updated on 24 January 2013.

The series of the *KCDB Newsletters* ceased with [Issue 16](#) dated 15 December 2011. News on the KCDB and the JCRB are now published in the series of the [BIPM-eNews](#). This e-letter from the BIPM is issued twice a year, in June and December.

### 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 2013.

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	0	0	-	4	1
Bangladesh	29 March 2010	25 March 2011	0	0	-	0	2
Belarus	05 May 2003	14 October 2003	158	0	07 April 2004	29	24
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	1
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	69	37
Costa Rica	29 January 2004	06 October 2004	86	0	26 November 2008	16	15
Cuba	19 December 2000	18 June 2001	88	0	02 May 2005	6	13
Ecuador	20 November 2000	15 April 2001	20	0	16 September 2011	5	14
Estonia	27 January 2005	23 March 2005	0	0	-	6	8
Georgia	01 January 2008	17 June 2008	0	0	-	3	2
Ghana	17 September 2009	24 February 2010	0	0	-	1	2
Hong Kong (China)	08 April 2000	31 May 2000	335	0	13 December 2000	55	15
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	6
Lithuania	12 March 2001	12 April 2001	95	0	11 December 2003	16	11
Macedonia, the FYR of	10 October 2006	14 November 2007	0	0	-	4	3
Malta	11 April 2001	20 June 2001	0	0	-	2	2
Mauritius	05 October 2010	09 March 2011	0	0	-	3	3
Moldova, Rep. of	01 January 2007	14 November 2007	0	0	-	2	2
Montenegro	01 August 2011	19 October 2011	0	0	-	3	1
Namibia	10 August 2012	16 October 2012	0	0	-	1	2
Panama	03 August 2003	16 September 2003	34	0	11 September 2006	9	11
Paraguay	06 May 2009	27 October 2009	23	0	31 January 2011	2	12
Peru	28 May 2009	17 November 2009	110	0	03 August 2010	10	24
Philippines	01 June 2002	19 December 2002	0	0	-	11	5
Seychelles	10 September 2010	12 November 2010	0	0	-	1	1
Slovenia	02 June 2003	23 June 2003	308	0	11 May 2004	32	14
Sri Lanka	03 August 2007	14 November 2007	0	0	-	4	2
Syrian Arab Republic	31 May 2012	17 September 2012	0	0	-	9	4
Ukraine	19 August 2002	14 October 2003	181	0	10 January 2005	33	35
Viet Nam	10 October 2003	16 September 2004	31	0	21 July 2010	26	7
Zambia	10 December 2010	3 February 2011	0	0	-	1	4
Zimbabwe	14 September 2010	14 January 2011	0	0	-	1	5

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

<sup>1</sup> These numbers do not include the movements generated by robots.



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.

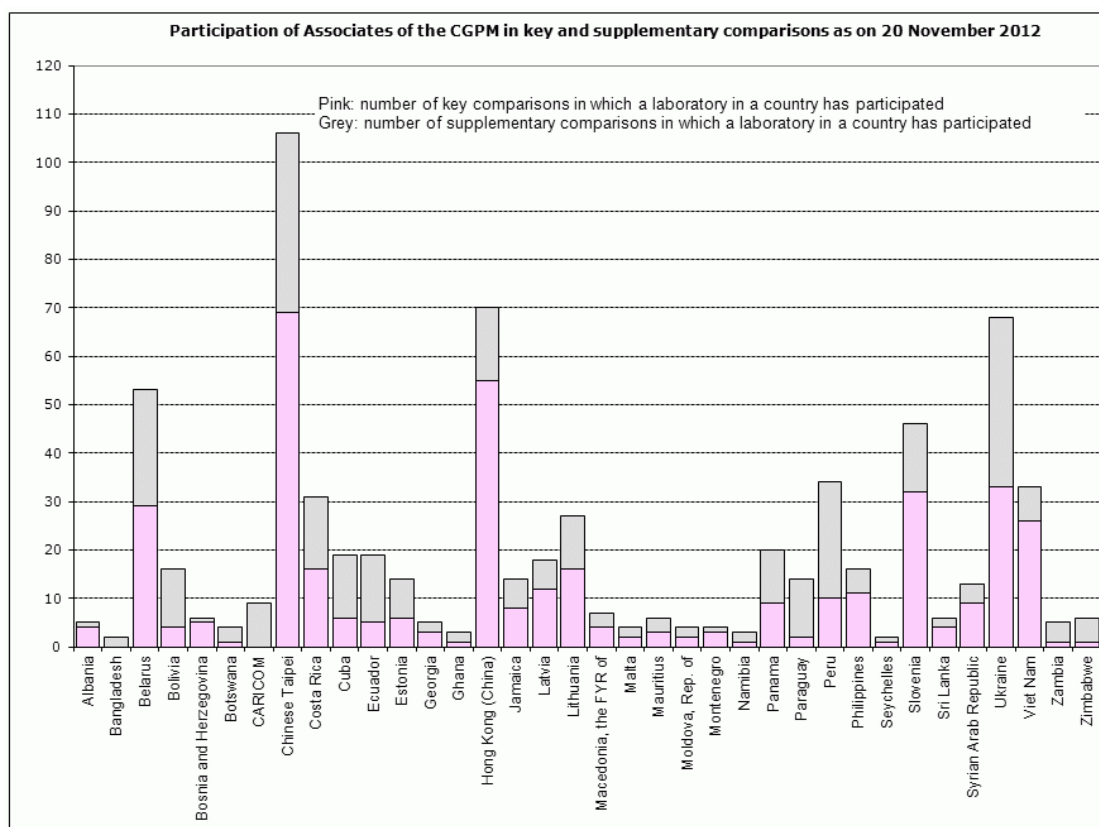
**Note:**

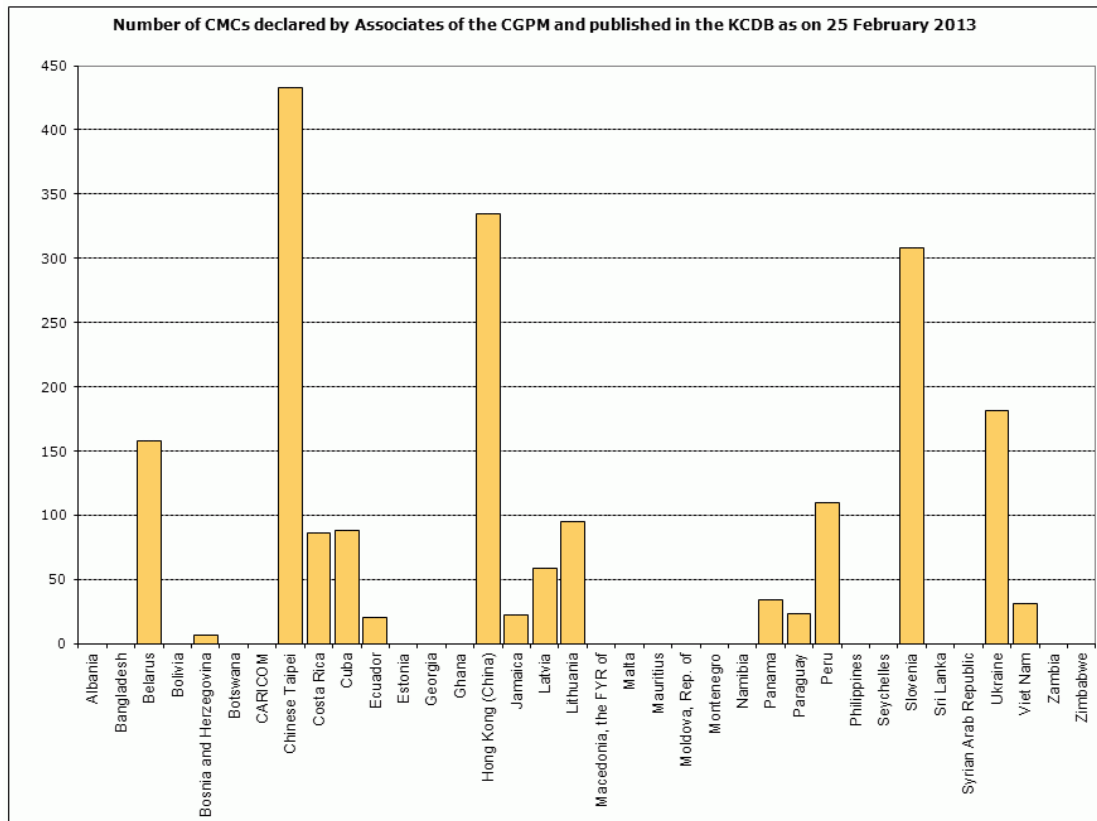
As the numbers on participation in key and supplementary comparisons change only slowly with time, the corresponding KCDB statistics are updated every six months. The numbers given here show the situation as at 20 November 2012. However, as the numbers of CMCs published in the KCDB can vary quickly, they are updated in real-time in all KCDB Statistics files. The numbers of CMCs given here show the situation as at 25 February 2013.

One observes that all of the Associates who participate in the CIPM MRA have at least one of their metrology institutes listed as participant in a key or a supplementary comparison, whereas only 16 of the 36 currently have CMCs published in the KCDB, as shown on the graphs below.

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

Globally, the situation was approximately the same six months ago and it reveals how long and difficult the effort is to complete the whole CIPM MRA scheme.





## 7. 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 of course always kept up-to-date according to the requirements of the BIPM Quality Manual. Most of the KCDB QMS procedures are kept confidential.