

## KCDB REPORT TO THE 28th 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-27/06) was presented at the 27th meeting of the JCRB, held on 14-15 September 2011 at BEV, Vienna, Austria, and reflected the situation as at 01 September 2011. The present report covers the six-month period from 01 September 2011 to 01 March 2012.

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

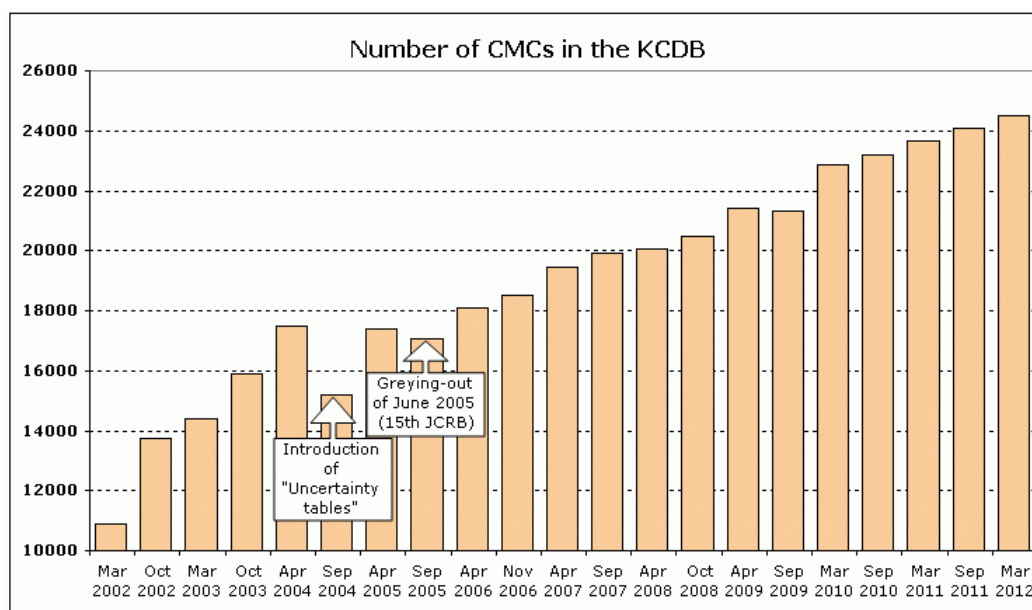
1. Statistics on the content of the KCDB are prepared by the KCDB Office and are available on-line from the [KCDB Statistics page](#). This includes the number of key and supplementary comparisons (updated in real-time), and PDF files showing the participation in key and supplementary comparisons (updated 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. The full set of *KCDB Newsletters* is always available on-line from the [KCDB Statistics page](#) (bottom of the page).
5. 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 2012, the KCDB included a total of 24 508 CMCs:

- 15 624 in General Physics,
- 3 902 in Ionizing Radiation, and
- 4 982 in Chemistry.



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

Over the period covered by this Report, 34 newly approved sets of CMCs were published (see Section 1.2 below), corresponding to an additional 428 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 2011 2010, the following sets of CMCs have been published in the KCDB (States or Economies in green are Associates):

- 07 September 2011; COOMET.RI.8.2010 (UA); +1 CMC.
- 16 September 2011; EURAMET.M.22.2011 (FR); +0 CMC.
- 16 September 2011; SIM.M.16.2011 (EC); +20 CMCs (**very first set of CMCs from Ecuador**).
- 20 September 2011; APMP.PR.8.2011 (KR); +10 CMCs.
- 26 September 2011; EURAMET.M.24 and .25.2011 (ES); +1 CMC.
- 27 September 2011; COOMET.RI.9.2011 (CU); +25 CMCs.
- 29 September 2011; EURAMET.EM.7.2010 (BE, CH, DE, ES, FI, FR, GB, IT, NL, PL, RS, SE, SI, and TR); +27 CMCs.
- 03 October 2011; COOMET.T.7.2011 (UA); +24 CMCs.
- 05 October 2011; COOMET.AUV.6.2011 (UA); +8 CMCs.
- 18 October 2011; APMP.M.29.2011 (VN); +3 CMCs.
- 25 October 2011; APMP.L.19.2011 (TW); +24 CMCs.
- 25 October 2011; COOMET.TF.5.2011 (KZ); +4 CMCs.
- 27 October 2011; SIM.TF.7.2011 (PA); +8 CMCs.
- 15 November 2011; EURAMET.M.21.2011 (PT, ES, DK, and GR); +13 CMCs.
- 17 November 2011; COOMET.L.5.2011 (RU); +1 CMC.
- 01 December 2011; SIM.M.21.2011 (US); +1 CMC.
- 09 December 2011; SIM.M.19.2011 (MX); +2 CMCs.
- 09 December 2011; COOMET.L.7.2011 (KZ); +1 CMC.
- 09 December 2011; AFRIMETS.QM.9.2011 (ZA, Cat 8); +0 CMC.
- 13 December 2011; COOMET.L.8.2011 (KZ); +1 CMC.

- 14 December 2011; COOMET.QM.18.2011 (BY, Cat 4; BY, Cat 6; RU, Cat 1; RU, Cat 4; RU, Cat 6; RU, Cat 7; RU, Cat 8; RU, Cat 9; UA, Cat 6; UA, Cat 7; and UA Cat 4); +63 CMCs.
- 20 December 2011; APMP.QM.17.2011 (CN, Cat 4; JP, Cat 4; TH, Cat 4; CN, Cat 6; HK, Cat 6; JP, Cat 6; KR, Cat 6; TH, Cat 6; CN, Cat 7; CN, Cat 1; JP, Cat 1; CN, Cat 2; CN, Cat 9; JP, Cat 9; CN, Cat 11; JP, Cat 11; and HK, Cat 1); +146 CMCs.
- 27 December 2011; first part of EURAMET.QM.20.2011 (BG, Cat 6; CZ, Cat 6; DE, Cat 6; DK, Cat 6; FR, Cat 6; HU, Cat 6; PL, Cat 6; SK, Cat 6; CZ, Cat 7; DE, Cat 7; DK, Cat 7; HU, Cat 7; IT, Cat 7; PL, Cat 7; and SK, Cat 7); -17 CMCs.
- 04 January 2012; second part of EURAMET.QM.20.2011 (DE, Cat 4; DE, Cat 1; GB, Cat 1; FR, Cat 3; CH, Cat 4; NL, Cat 4; FR, Cat 4; PT, Cat 4; SK, Cat 4; GB, Cat 4; TR, Cat 5; DE, Cat 8; IT, Cat 8; SI, Cat 8; GB, Cat 8; DE, Cat 9; FR, Cat 9; GB, Cat 9; TR, Cat 10; GB, Cat 10; DE, Cat 11; FR, Cat 11; TR, Cat 11; GB, Cat 11; and DE, Cat 12); -43 CMCs.
- 13 January 2012; APMP.AUV.9.2011 (CN, and ID); +47 CMCs.
- 17 January 2012; APMP.AUV.8.2011 (TW, and IN); +27 CMCs.
- 19 January 2012; SIM.EM.5.2011 (MX); +0 CMC.
- 27 January 2012; APMP.L.20.2011 (TH); +9 CMCs.
- 31 January 2012; EURAMET.RI.12.2011 (CH, PL, NO, FI, AT, SE, NL, and HU); -7 CMCs.
- 03 February 2012; EURAMET.PR.10.2011 (DE, PL, RO, ES, and CH); +8 CMCs.
- 07 February 2012; first part of EURAMET.T.9.2011 (FR); +12 CMCs.
- 13 February 2012; APMP.M.26.2010 (CN); +1 CMC.
- 14 February 2012; second part of EURAMET.T.9.2011 (DE, DK, ES, FI, GB, HU, IT, and SK); +26 CMCs.
- 15 February 2010; SIM.M.17.2011 (AR); +4 CMCs.
- 15 February 2010; SIM.M.20.2011 (PE); +1 CMC.

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

- Editorial changes.
- Deletion of services that are no longer available [on 07 November 2011, IT (TF) -2 CMCs; on 18 January 2012, CH (L) -1 CMC, and DE (L) -1 CMC; on 19 January 2012, MX (PR) -6 CMCs; and on 13 February 2012, DE (QM, Cat 1) -7 CMCs, DE (QM, Cat 9) -1 CMC, and BE (M) -5 CMCs].
- Correction of a misspelling in the UME full laboratory name (25 September 2011), change in the laboratory acronym and name for Singapore: A\*STAR changed for NMC, A\*STAR (25 January 2012).

### 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 2011, the following actions have been taken:

- 16 September 2011; definitive deletion of the 143 CMCs in RI from Latvia that had been greyed-out on 10 March 2010, following decision of the 27th JCRB meeting (laboratory that is no more designated for participating in the CIPM MRA).
- 20 December 2011; greying-out of 5 CMCs in QM Cat 6, from Korea.

As at 01 March 2012, 189 CMCs were temporarily removed from the KCDB, compared with 327 as at 01 September 2011 (see table below).

As at 01 March 2012, there remained only 10 CMCs greyed-out from the KCDB more than five years ago: MX (EM), 1 CMC; MX (RI, Neutron measurements), 1 CMC; and GR (AUV), 8 CMCs.

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	AUV	OM	TF	Total
<b>APMP</b>										
NZ			5							5
KR								5		5
										Total APMP: 10
<b>AFRIMETS</b>										
ZA		5								5
										Total AFRIMETS: 5
<b>EURAMET</b>										
BG						1				1
FR	3									3
GR							8			8
										Total EURAMET: 12
<b>SIM</b>										
MX			1		46			7		54
AR					66					66
JM	22									22
CA		9				11				20
										Total SIM: 162
<b>Total: 189 CMCs</b>										

*Number of CMCs temporary removed ("greyed-out") from the KCDB, by country and by metrology area, as at 01 March 2012*

**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 2012

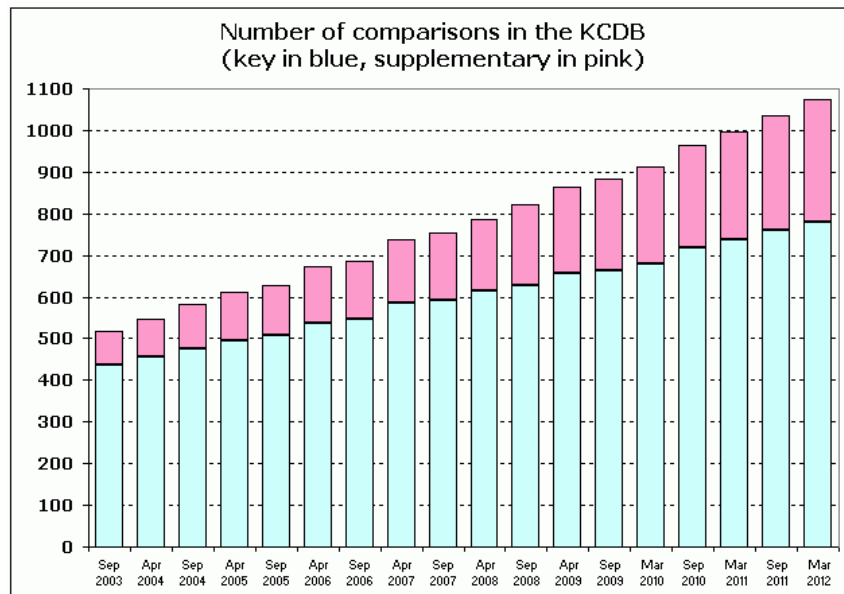
APMP: 5 441 CMCs  
 COOMET: 1 899 CMCs  
 EURAMET: 11 889 CMCs  
 AFRIMETS: 380 CMCs  
 SIM: 4 639 CMCs  
 IAEA: 13 CMCs  
 IRMM: 247 CMCs  
 WMO: 0 CMCs

## 2. Key and supplementary comparisons database

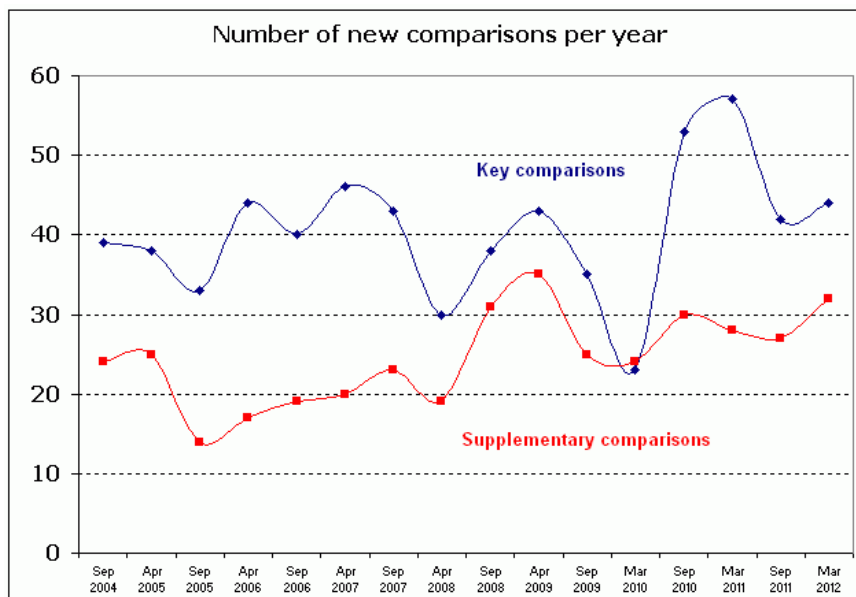
### 2.1. Content of the database

As at 01 March 2012, the database covered 781 key comparisons (86 from the BIPM, 386 from the CCs, 2 from AFRIMETS, 108 from APMP, 33 from COOMET, 124 from EURAMET, and 42 from SIM), and 292 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*

On average, 40 new key comparisons and 25 new supplementary comparisons are registered each year in the KCDB. These rates are now constant in time.

Updated graphs (PDF files) illustrating the participation in [key](#) and [supplementary](#) comparisons were made available from the [Statistics page of the KCDB](#) on 24 November 2011.

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

Since 01 September 2011, the following actions were taken:

- 02 September 2011; registration of [COOMET.EM-S10](#) and [COOMET.EM-S11](#).
- 05 September 2011; registration of [EURAMET.AUV.V-S1](#).
- 06 September 2011; registration of [CCQM-K100](#).
- 07 September 2011; registration of [COOMET.L-K3](#).
- 09 September 2011; registration of [APMP.L-K1.1.2011](#) and [EURAMET.QM-S5](#).
- 21 September 2011; registration of [COOMET.QM-K76](#) and [COOMET.QM-S1](#).
- 30 September 2011; registration of [APMP.T-K7.1](#).
- 19 October 2011; registration of [EURAMET.M.M-S3](#) and [EURAMET.M.P-S11](#).
- 24 October 2011; registration of [CCQM-K101](#).
- 07 November 2011; registration of [APMP.M.H-S4](#), [COOMET.M.F-S2](#) and [EURAMET.T-K3](#).
- 14 November 2011; registration of [COOMET.M.T-S1](#).
- 18 November 2011; registration of [APMP.QM-K46](#).
- 20 November 2011; registration of [CCRI\(II\)-K2.Tc-99](#).
- 21 November 2011; registration of [APMP.T-K3.5](#).
- 24 November 2011; registration of [SIM.M.M-S10](#) and [EURAMET.QM-K26.a](#).
- 25 November 2011; registration of [EURAMET.QM-K16](#).
- 26 November 2011; registration of [APMP.T-K8](#).
- 03 December 2011; registration of [SIM.M.P-S7](#).
- 06 December 2011; deletion of AFRIMETS.QM-S1; registration of [COOMET.M.M-K8](#).
- 07 December 2011; registration of [BIPM.RI\(II\)-K1.Ag-111](#) and [BIPM.RI\(II\)-K1.C-11](#).
- 16 December 2011; registration of [CCT-K6.1](#).
- 20 December 2011; registration of [SIM.EM-S9.b](#).
- 23 December 2011; registration of [EURAMET.EM-S35](#).
- 13 January 2012; registration of [EURAMET.PR-S3](#) and [EURAMET.PR-S4](#).
- 17 January 2012; registration of [SIM.M.P-S8](#).
- 06 February 2012; registration of [APMP.M.P-K1.c.2](#), [APMP.M.G-S1](#) and [CCT-K9](#).
- 08 February 2012; renaming of APMP.T-K3.3 in [CCT-K3.2](#); registration of [EURAMET.L-K1.2011](#).
- 17 February 2012; registration of [EURAMET.T-K7.2](#).
- 20 February 2012; change of EURAMET.T-S3 to [EURAMET.T-K6.1](#).

This resulted in an additional 22 key comparisons and 17 supplementary comparisons registered in the KCDB over the six-month period covered by this report.

One comparison previously registered was suppressed, one supplementary comparison became a key comparison, and one existing identifier was modified.

One observes that two new BIPM on-going key comparisons were registered in December 2011: they concern the measurements of radionuclides Ag-111 and C-11.

## 2.3. Published results of key and supplementary comparisons

As at 01 March 2012, among the 781 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";

- 74 of the 88 ongoing BIPM key comparisons had results published in the KCDB; these are regularly extended as new data become available (18 new results were published since 01 September 2011); and
- another 366 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 1 760 graphs of equivalence, including more than 90 new graphs of equivalence published over the last six months.

The results of 153 RMO key comparisons (compared with 143 at the time of the 27th JCRB meeting) - 56 conducted by APMP, 17 by COOMET, 65 by EURAMET, and 15 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 44 bilateral key comparisons subsequent to full-scale CC key comparisons; their results are included in the appropriate graphs of equivalence.

Since August 2011, we have had one example of a family of eight key comparisons linked together: [M.M-K1](#) (1 kg stainless steel standards), including 82 degrees of equivalence relative to the CCM.M-K1 key comparison reference value. These results span over more than 10 years and a new central CIPM key comparison, [CCM.M-K4](#), has been launched with the BIPM acting as the pilot laboratory, then restarting the whole exercise. A number of similar examples gathering seven or six key comparisons linked together can be found in the KCDB.

The final reports of 168 of the 292 supplementary comparisons registered in the KCDB were also posted in the KCDB as at 01 March 2012.

All together 65 % 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 average number of monthly visits to the KCDB website remained roughly constant over the year 2010, at the level of about 7 200. The average number of pages consulted during each visit had increased significantly, compared to the year 2009, as has the average duration of each visit.

The log-on statistics recorded for the period January – December 2011 indicates a slight increase of the average number of monthly visits, at the level of 7 800, and of the average number of KCDB web pages opened each month, at the level of 110 000.

We do believe that the KCDB website continues to attract our key communities: National Metrology Institutes, regulators, accreditors, commercial and industrial companies.

As already observed, all pages are equally visited, including the News page, the Statistics page, and the Newsletters; 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) for 31 % of them, a percentage slightly superior to what was observed over year 2010. Internet search engines (Google, Yahoo, etc.) lead about 9 % of our visitors to the KCDB website, the remaining 60 % reach our web page 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.

The regular biannual KCDB Reports, initially composed to be presented to the successive meetings of the JCRB, are now slightly transformed to be open to the largest public and

placed in the page "[Reports on the KCDB](#)" of the BIPM web site. This page gives also access to a [tutorial presentation on the KCDB](#).

In view of the renovation of the BIPM and KCDB web sites that should take place early 2013, we have drawn up a questionnaire on the usability of our web applications. This was first tested at the CCPR and related Working Group meetings at the end of February 2012. When refined, this questionnaire is going to become a web-based survey, open to the largest public. The results obtained will be taken into account to improve our future system.

## 5. Publicity

[Issue 16](#) of the *KCDB Newsletter* was published on 15 December 2011.

The *KCDB Newsletter* No 16 was successfully sent from the BIPM to 3 000 e-mail addresses around the world. It was posted on the KCDB website and was also advertised (with a web link) in a number of regular e-Bulletins, such as the NCSLI and CFM Bulletins, and also in some RMO websites.

Issue 16 was the last one of the *KCDB Newsletter* series. From now on, the information traditionally reported in the *KCDB Newsletter* will be merged with the content of the [BIPM Bulletins](#), to create a new and unique *BIPM e-letter*.

## 6. 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 2012.

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	-	3	0
Bangladesh	29 March 2010	25 March 2011	0	0	-	0	2
Belarus	05 May 2003	14 October 2003	158	0	07 April 2004	26	23
Bolivia	04 April 2008	16 May 2008	0	0	-	4	6
Bosnia and Herzegovina	24 May 2011	15 June 2011	0	0	-	4	1
CARICOM	10 October 2005	12 October 2005	0	0	-	0	7
Chinese Taipei	26 April 2002	04 June 2002	432	0	21 October 2003	67	35
Costa Rica	29 January 2004	06 October 2004	78	0	26 November 2008	16	9
Cuba	19 December 2000	18 June 2001	88	0	02 May 2005	4	12
Ecuador	20 November 2000	15 April 2001	20	0	16 September 2011	4	7
Estonia	27 January 2005	23 March 2005	0	0	-	6	9
Georgia	01 January 2008	17 June 2008	0	0	-	0	2
Ghana	17 September 2009	24 February 2010	0	0	-	0	1
Hong Kong (China)	08 April 2000	31 May 2000	325	0	13 December 2000	50	15
Jamaica	15 September 2003	21 July 2004	0	22*	24 August 2006	8	4
Latvia	11 January 2001	13 March 2001	59	0	23 March 2005	12	6
Lithuania	12 March 2001	12 April 2001	91	0	11 December 2003	15	11
Macedonia, the FYR of	10 October 2006	14 November 2007	0	0	-	3	2
Malta	11 April 2001	20 June 2001	0	0	-	2	1
Mauritius	05 October 2010	09 March 2011	0	0	-	2	3
Moldova, Rep. of	01 January 2007	14 November 2007	0	0	-	1	2
Montenegro	01 August 2011	19 October 2011	0	0	-	2	0
Panama	03 August 2003	16 September 2003	34	0	11 September 2006	9	9
Paraguay	06 May 2009	27 October 2009	23	0	31 January 2011	2	6
Peru	28 May 2009	17 November 2009	26	0	03 August 2010	8	14
Philippines	01 June 2002	19 December 2002	0	0	-	10	5
Seychelles	10 September 2010	12 November 2010	0	0	-	1	1
Slovenia	02 June 2003	23 June 2003	293	0	11 May 2004	29	9
Sri Lanka	03 August 2007	14 November 2007	0	0	-	4	2
Tunisia	23 October 2007	14 November 2007	0	0	-	2	0
Ukraine	19 August 2002	14 October 2003	168	0	10 January 2005	30	36
Viet Nam	10 October 2003	16 September 2004	23	0	21 July 2010	24	7
Zambia	10 December 2010	3 February 2011	0	0	-	1	3
Zimbabwe	14 September 2010	14 January 2011	0	0	-	1	4

*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.

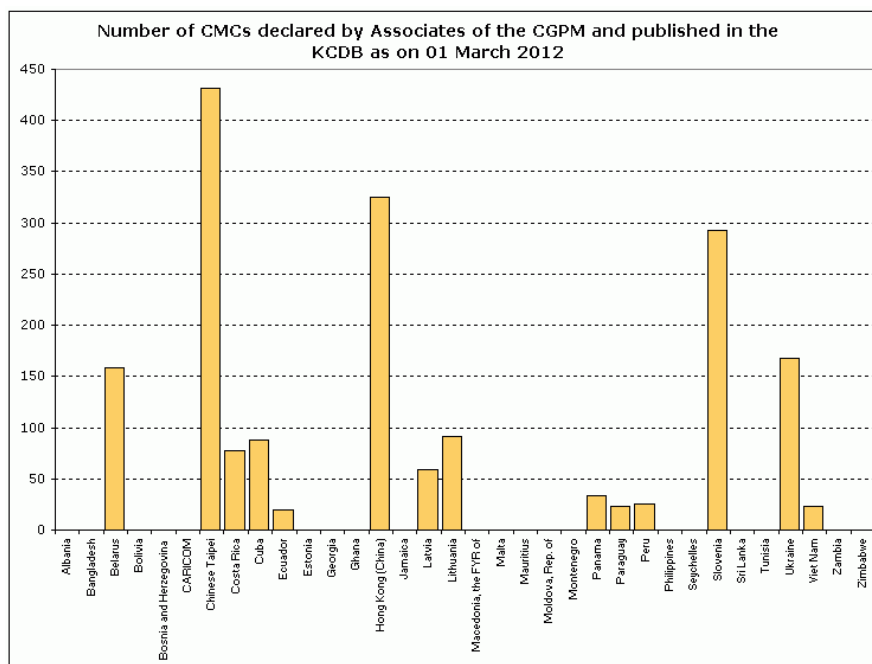
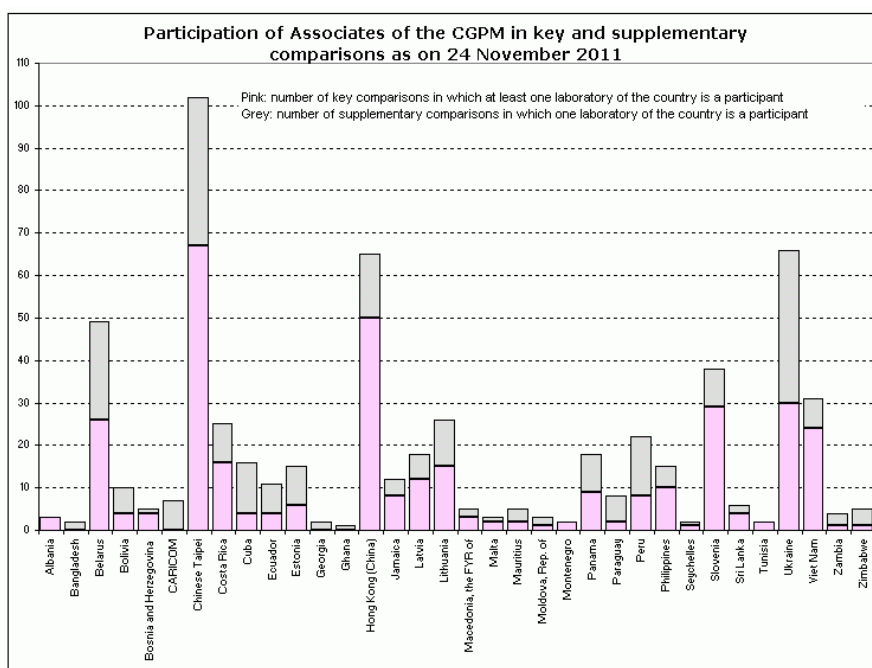


**Note:**

As the numbers on participation in key and supplementary comparisons change only slowly with time, the corresponding KCDB statistics are updated every six months at the time of preparation of the *KCDB Newsletter* (typically May and December of each year). The numbers given here show the situation as at 24 November 2011. 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 01 March 2012.

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 14 of the 34 currently have CMCs published in the KCDB, as shown on the graphs below. This situation was approximately the same six months ago and reveals how long and difficult the effort is to complete the whole CIPM MRA scheme.

It should, however, be noted that the total number of CMCs from Associates has increased by 11 % over the last six-month period (+190 CMCs).



## **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.