

# CCQM Strategy Document (2017-2026)

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**B**ureau  
♦ **I**nternational des  
♦ **P**oids et  
♦ **M**esures



# Overview

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1. **Timeline**
2. **Addressing CIPM MRA issues**
3. **Participation**
4. **Core Comparison Models**
5. **Broad Scope CMCs (started)**
6. **Increased activities of RMOs**
7. **Comparisons per year**
8. **CCQM Workshops**
9. **Impact case studies from 2012-2016**

# CCQM Strategy Document (2017-2026) -1 year Development Timeline

Major review of WG Strategy Documents (bottom up): **Start in April 2016**

Major review of CCQM Strategy Document (top down): **Start in April 2016**

Discussion of revised versions in WGs: **October/November 2016** (*completed*)

Submission to SPWG: **December 2016** (*completed; available as CCQM/17-05&06*)

Draft CCQM (2017-2026) strategy to CCQM for comment: **March 2017** (*available as CCQM/17-10*)

Comments from CCQM: **18 April 2017** (1 set of comments received)

CCQM Workshop on Strategy Document: **26 April 2017**

CCQM plenary meeting review of 2017-2026 Strategic Plan Document: **27-28 April 2017**

Revised CCQM Strategy document available: **June 2017**

# CIPM-MRA Review: Some outcomes

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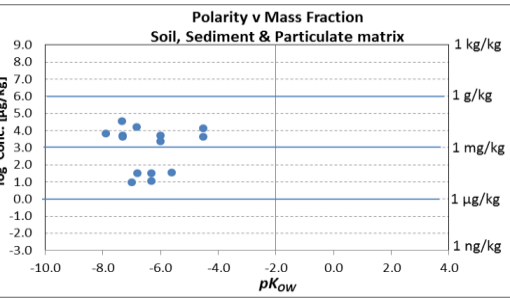
- 1) The success and importance of the CIPM MRA is recognized
- 2) The resources used for the CIPM MRA should not increase (and preferentially be decreased)
- 3) The Chem-Bio community should review their CMC template (to see if revision/simplification is necessary)
- 4) The relationship between CMCs and services needs further examination (general comment – not just for Chem-Bio)
- 5) The Broad Scope CMC approach will be investigated further (general comment – not just for Chem-Bio)
- 6) A new database – web based for data entry – improved search capability – is to be developed – Chem-Bio should be clear on their requirements.

# CCQM WG Participation

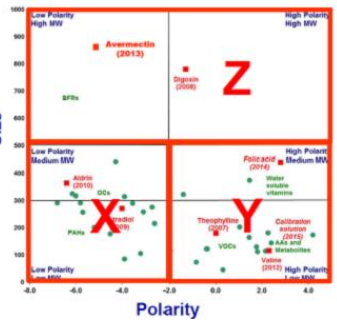
CCQM Working Group	Number of NMIs/DIs eligible to have WG contact person	Number of NMIs/DIs with registered WG contact person	Number of NMIs/DIs participating in April 2017 meetings	Estimated Number of CMCs underpinned by WG activities as of 31/01/17
IAWG	43	27	43	2057
GAWG	34	24	32	2340
EAWG	30	22	21	141
OAWG	29	23	29	1650
PAWG	25	13	21	3
NAWG	22	13	23	10
CAWG	20	10	16	0
SAWG	17	12	13	26

# Development and Implementation of Models for Core Comparisons

## OAWG



Measurement Capabilities for complex matrices

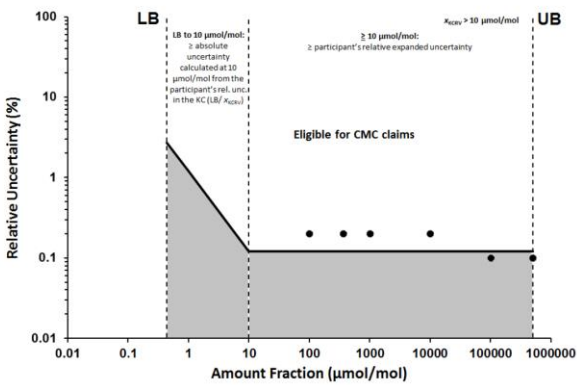


Primary Reference Material /Calibrator Measurement Capabilities

www.bipm.org

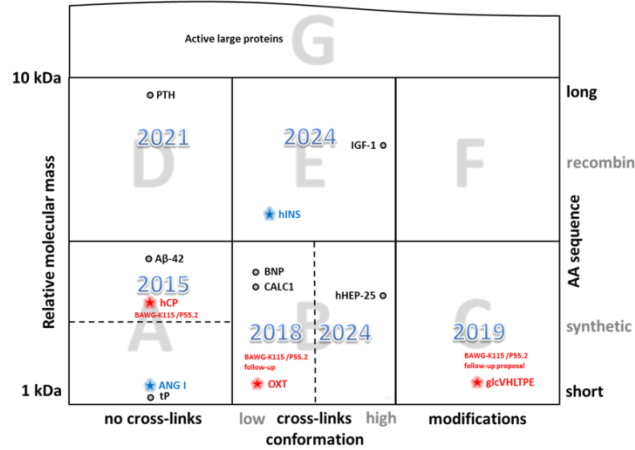
## GAWG

Example track A (K52 - NPL)



Core Comparisons for binary mixtures

## PAWG



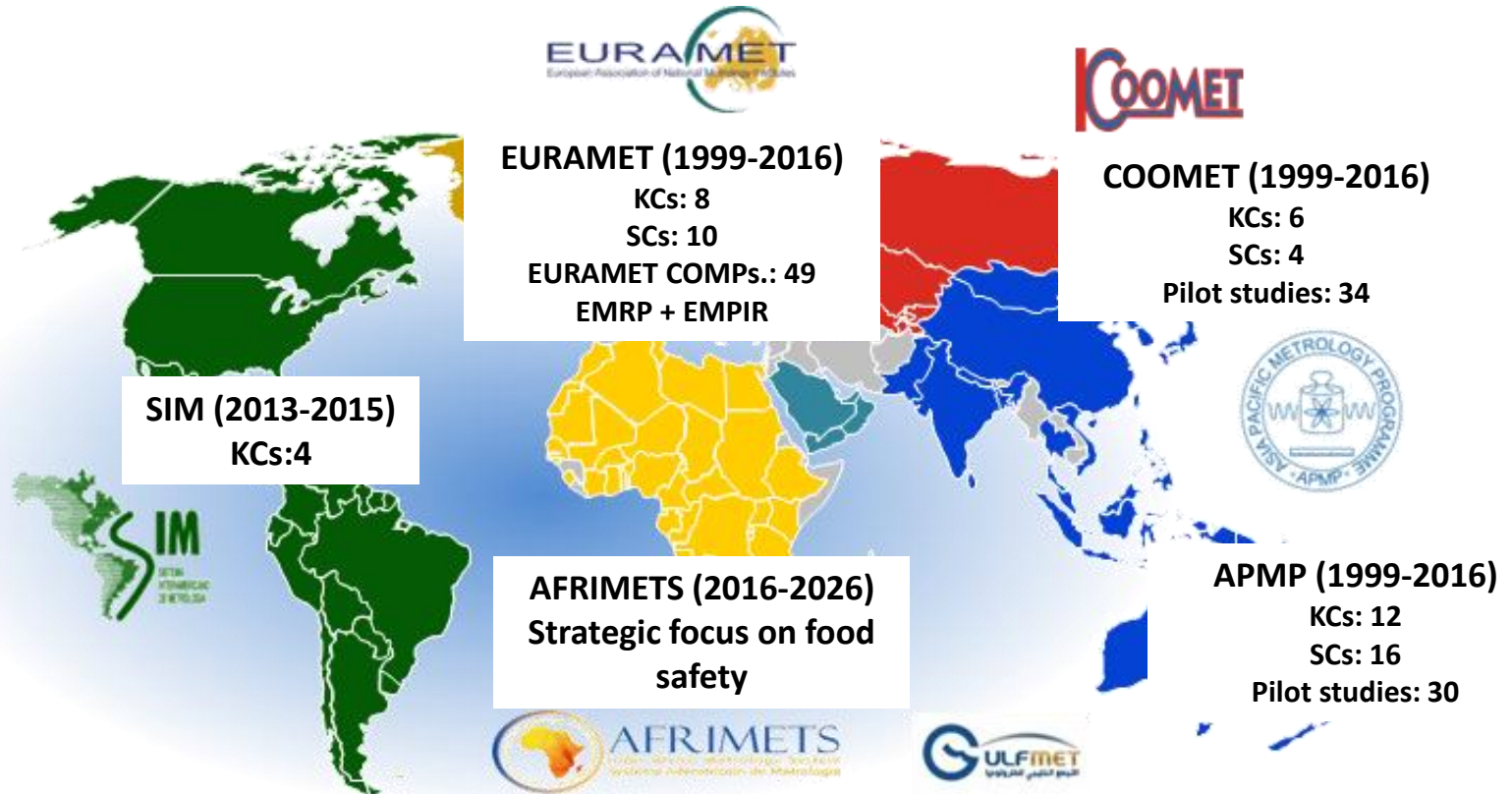
Primary Reference Material /Calibrator Measurement Capabilities

# Ad hoc CCQM KCDB 2.0 WG Recommendations (CCQM/17-06)

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- 1) Simplify CMC template by suppressing 9 columns**
- 2) Review measurement service categories (classification & use)**
- 3) CMC template to be able to accommodate Bio measurand descriptions (long)**
- 4) Discuss further introduction of broad scope CMCs into database**
- 5) Keep 'analyte group' descriptor in template**
- 6) Produce CCQM best practice guides on units to be used in the KCDB**
- 7) Support for web-based tool: tracking complete CMC submission and review process**

# RMO Activities: Impact on CCQM strategy?





# RMO strategies

## AFRIMETS (2016-2026) Strategic focus on food safety

Date	Activity
2017-2021	Five year Seasonal Pesticides in fruit/vegetable PT scheme (one per quarter), pilot, NMISA
Early 2018	Mycotoxin in maize PT, pilot by NMISA (in collaboration with NIM China) Propose AFRIMETS Supplementary comparison
March 2018	<b>Training Workshop:</b> Mycotoxin metrology workshop: NMISA, South Africa
Late 2018	Aflatoxin in peanut PT, pilot by NMISA (in conjunction with IAEA-AFRA 5078 food safety network project) Propose AFRIMETS Supplementary comparison
2018/19	Training secondments at NMISA on mycotoxin analysis in maize/nuts Secondments will be 3 months in duration (May-July; Sept-Nov) accommodating 2 visiting scientists per year
2018/19	Seasonal Pesticides in fruit/vegetable PT scheme, pilot, NMISA Propose AFRIMETS Supplementary comparison
Early 2019	Antibiotic residue in meat/tissue PT, pilot by NMISA (in conjunction with IAEA-AFRA 5078 food safety network project) Propose AFRIMETS Supplementary comparison
2019/20	Training secondments at NMISA on mycotoxin analysis in maize/nuts Secondments will be 3 months in duration (May-July; Sept-Nov) accommodating 2 visiting scientists per year

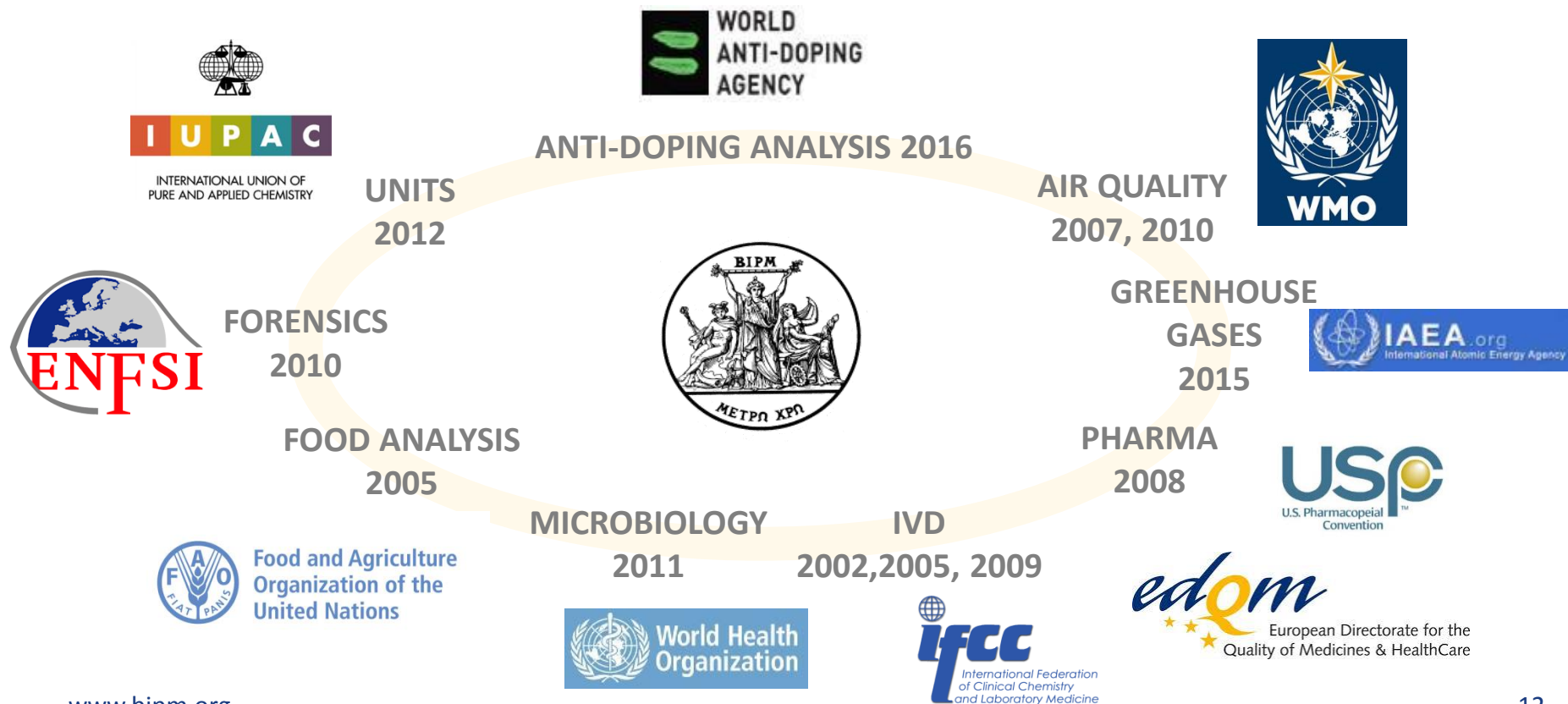
# CCQM Comparisons 2017-2026

CCQM Working group	Number* of Key comparisons 2013-2016	Number* of (standalone) Pilot Studies 2013-2016	Approximate Number of CMCs underpinned by WG activities at the end of 2016	Estimated Number of Key comparisons for 2017-2026	Estimated Number of (standalone) Pilot Studies for 2017-2026
Gas Analysis Working Group (GAWG)	9	0	2340	27	3
Organic Analysis Working Group (OAWG)	12	1	1650	20 to 25 <sup>a</sup>	0 to 5 <sup>b</sup>
Inorganic Analysis Working Group (IAWG)	13	3	2057	30	8 <sup>c</sup>
Electrochemical analysis (EAWG)	4	3	141	15 <sup>d</sup>	5 <sup>d</sup>
Surface Analysis Working Group (SAWG)	2	1	26	5 <sup>d</sup>	7 <sup>d</sup>
Nucleic acid Analysis Working Group (NAWG)	2	2	10	10 <sup>e</sup>	10 <sup>e</sup>
Protein Analysis WG (PAWG)	1	1	3	6 <sup>f</sup>	6 <sup>f</sup>
Cell Analysis Working Group (CAWG)	0	1	0	2	3
Total number of CCQM comparisons (2013-2016)	43	12	-	-	-
Average number of CCQM comparisons per year (2013-2016)	11	3	-	-	-
Estimated total number of CCQM comparisons (2017-2026)	-	-	-	115 to 120	42 to 47
Estimated average number of CCQM comparisons per year (2017-2026)	-	-	-	12	4 to 5

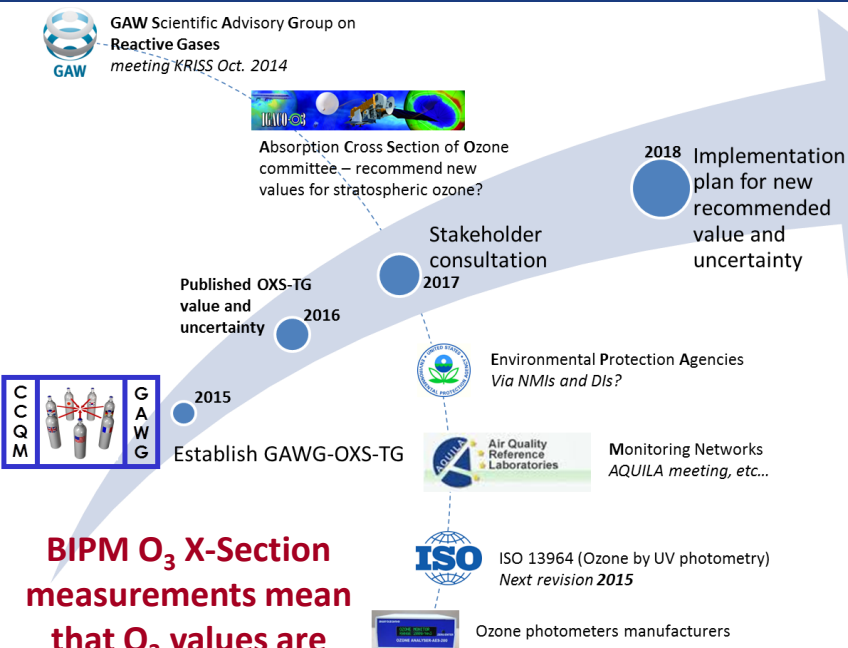
# Resources for Comparisons

<b>CCQM Working group</b>	<b>Minimum resources for Sample Preparation in Person Months (PM)</b>	<b>Maximum resources for Sample Preparation in Person Months (PM)</b>	<b>Minimum resources for Comparison Coordination in Person Months (PM)</b>	<b>Maximum resources for Comparison Coordination in Person Months (PM)</b>	<b>Minimum resources for Comparison PARTICIPATION in Person Months (PM)</b>	<b>Maximum resources for Comparison PARTICIPATION in Person Months (PM)</b>
Gas Analysis Working Group (GAWG)	2	12	3	6		
Organic Analysis Working Group (OAWG)	0.5*	20	6	12	1	12
Inorganic Analysis Working Group (IAWG)	12	18	6		1	
Electrochemical analysis (EAWG)	1	3	2	6	1	2
Surface Analysis Working Group (SAWG)	2	12	5	10	1	6
Nucleic acid Working Group (NAWG)	12	36			1	12
Protein Analysis Working Group (PAWG)	24	36			12	24
Cell Analysis Working Group (CAWG)	6	18	6	12	1	12

# CCQM/BIPM Workshops with Stakeholder Communities



# Impact of CCQM Ozone Standards and Comparison Activities



**BIPM O<sub>3</sub> X-Section measurements mean that O<sub>3</sub> values are 1.8% higher than historically reported**

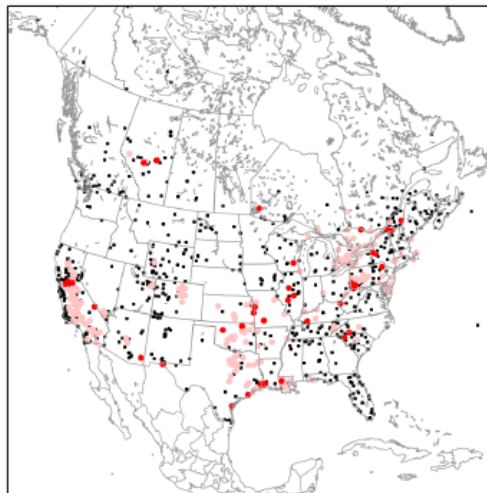
**Bureau International des Poids et Mesures**

\*20 % increase in the number of sites that are out of compliance with current US, Canadian, and European ozone air quality health standards for the year 2012

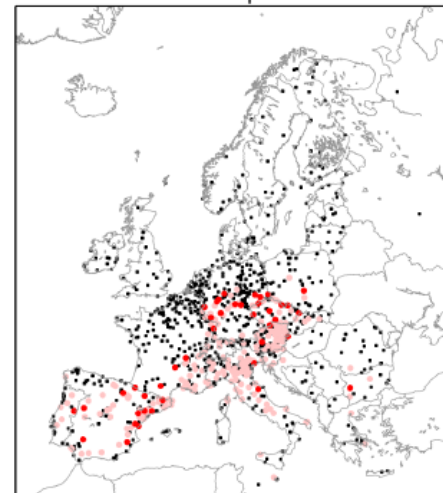
**Lead to actions for improved air quality\* for the World's Population**

Sofen, E. D., Evans, M. J., and Lewis, A. C.: Updated ozone absorption cross section will reduce air quality compliance, Atmos. Chem. Phys. Discuss., 15, 19537-19551, doi:10.5194/acpd-15-19537-2015, 2015.

**North America**



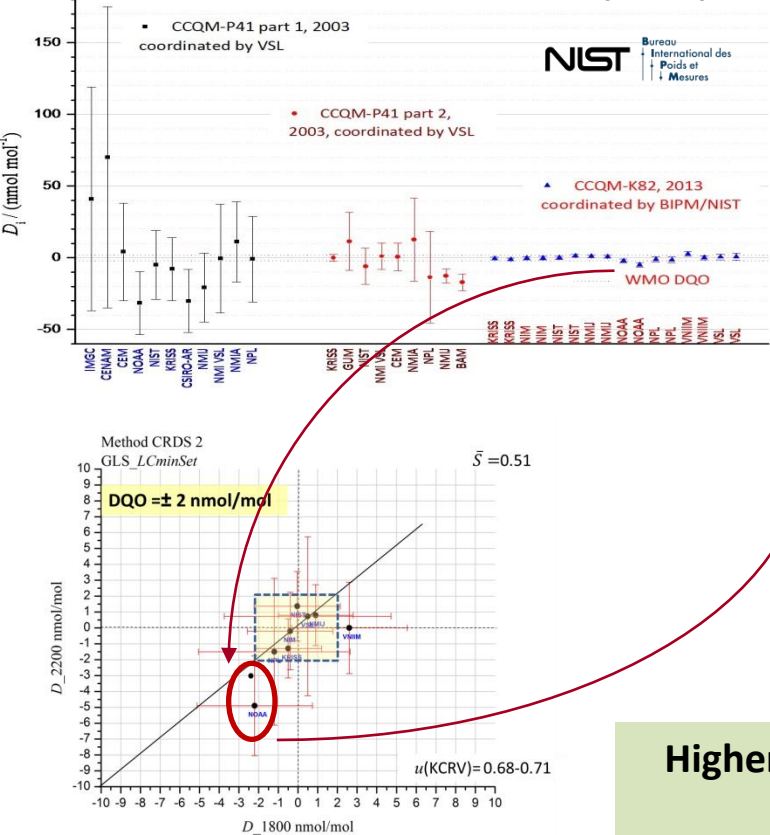
**Europe**



- Newly noncompliant under Viellon et al. [2015] only
- Noncompliance under Hearn [1961] and Viellon et al. [2015]
- Other sites (compliant/missing data)

# Impact of CCQM Greenhouse Gas Comparison Activities

CCQM-K82: Methane in Air (2013)

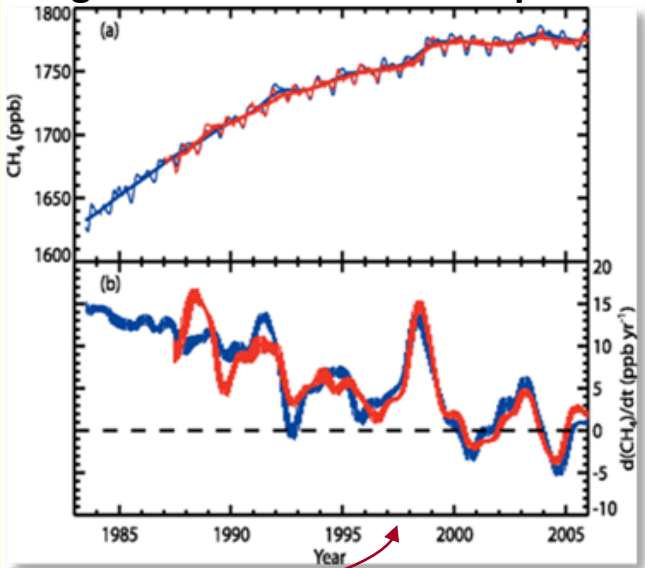


World's Scale for the second most important greenhouse gas is being adjusted in line with the SI (GGMT 2015)

Differences of 2 nmol/mol to 5 nmol/mol reported

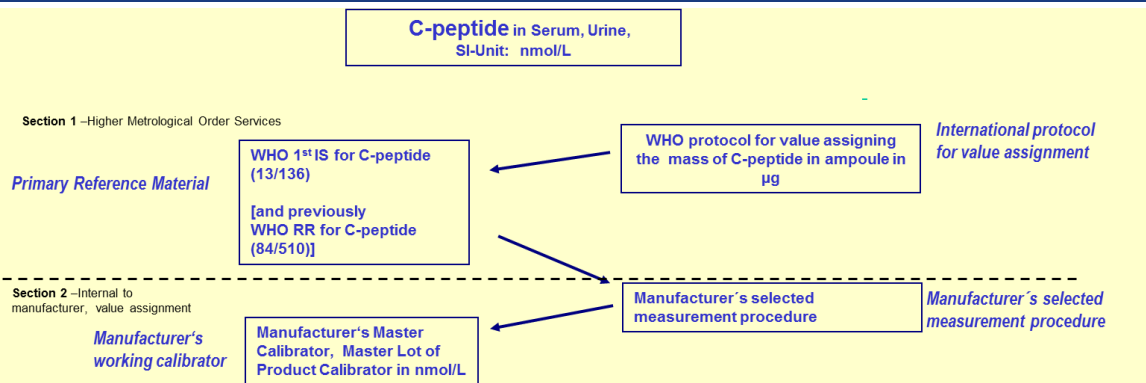
Comparable to the annual change in atmospheric methane levels

Methane concentration and growth rate in the Atmosphere



Higher profile for Metrology in Climate Change Measurement and Research

# CCQM Impact Case Study Example (2012-2016): Evolving calibration hierarchies for C-peptide



**Request for more case studies from 2012-2016 period**

**SI  
Reference Measurement System**

## WHO International Conventional System

### Implementing a Reference Measurement System for C-peptide: Successes and Lessons Learned

Randie R. Little<sup>1\*</sup>, Robert I. Wielgosz<sup>2</sup>, Ralf Josephs<sup>2</sup>, Tomoya Kinumi<sup>3</sup>, Akiko Takatsu<sup>3</sup>, Hongmei Li<sup>4</sup>, Chris Burns<sup>5</sup>

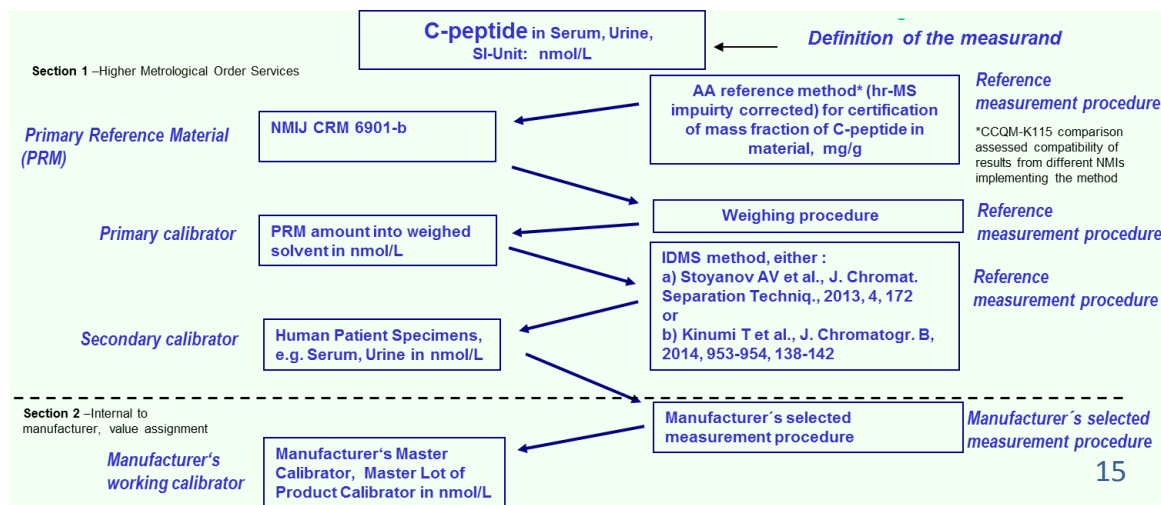
<sup>1</sup>University of Missouri School of Medicine, USA

<sup>2</sup>BIPM,

<sup>3</sup>NMIJ, Japan

<sup>4</sup>NIM, China

<sup>5</sup>NIBSC, UK



Thank you.

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