

News from the CIPM and update on Strategy development

21st Director & State Representative Meeting
October 2021

Wynand Louw
CIPM President



Bureau
| **I**nternational des
| **P**oids et
| **M**esures



Activities since the Director Webinar in October 2020

All annual CIPM and related meetings were held online

The CIPM task and working groups met from 23-26 March and two official CIPM meetings were held during the weeks of 22 June and 18 October 2021

A number of actions were finalised by correspondence. Official voting took place and the decisions were summarised for final noting at the following CIPM meeting

Physical meetings are expected to resume early in 2022



Highlights of the 110th meeting of the CIPM in March 2021 (and decisions taken by correspondence)

Decision CIPM/110-2 (2021)

The CIPM noted the decision taken by correspondence on 30 October 2020 to submit a vote to the JCGM “in favour” of the publication of GUM 6 (Guide to the expression of Uncertainty in Measurement - Developing and using measurement models)

Decision CIPM/110-3 (2021)

The CIPM noted the decision taken by correspondence on 18 November 2020 to conclude an MoU between the BIPM and the Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO) based on the draft circulated.

Highlights of the 110th meeting cont.

Four decisions on the reports and proposals from the Finance sub committee;

-Approved the budget for 2021

-Confirmed the audit by the Chair of FSC on the report of the Member States financial data

-Instructed the BIPM staff to inform the States with accumulated arrears of their financial situation

Decision CIPM/110-12 (2021)

The CIPM confirmed its approval of the audited financial statements of the BIPM and of the BIPM Pension and Provident Fund which were reviewed by the CIPM Sub-Committee on Finance in June 2021. The CIPM granted the BIPM Director quietus for the 2020 exercise



Highlights of the 110th meeting cont.

Decision on Membership of CCs

- NRC (Canada) should be a member of the CCRI
- NSC-IM (Ukraine) should be an observer at the CCRI

- NSC IM and SCL (Hong Kong, China – Associate Economy) should become observers at the CCT
- Justervesenet (Norway – Member state) should become a member of the CCT

- CMS/ITRI (Chinese Taipei) and NSC-IM (Ukraine) should become observers at the CCM

- NSC-IM (Ukraine) should be a member of the CCU

Update on the CIPM Strategy Development: Themes

Item	Description	Status	Outputs
1	Responding to Evolving Needs for Metrology	Consultation	Draft report to discuss with CCs and NMI; draft Resolution
2	Addressing key scientific challenges to advance the global measurement system	Consultation	Discussion document and report from CCTF, four draft Resolutions
3	Strategy for deepening engagement with other international organisations on measurement science issues	Completed & actions continue	Several MOUs concluded and procedures in place
4	Reviewing the strategy for the future membership of the organisation	Consultation	Draft Resolution to request mandate from the CGPM
5	Modernising the operations of the organisation & Governance (including liaison with the ad-hoc SR WG)	Ongoing	CIPM RoP, Code of Conduct, several polices and procedures on hybrid meetings, decisions by correspondence, etc. Resolution G



Update on the CIPM Strategy Development: Process

CGPM 2022

Five resolutions to improve the system and advance the SI

CGPM requested to mandate CIPM to develop proposals and to consult on broader participation

Consultation with CCs and stakeholders on Strategy reports

CIPM 2022-2026

CIPM consults with Member States and the community on popular new vision/mission, model for broader participation, investigate best practice for IOs

Concludes and Presents Strategy 2030+ to the community in 2025

CGPM 2026

Member States agree on:

- modernising the organisation, new vision/mission
- structures,
- funding models,
- broader participation

for full implementation



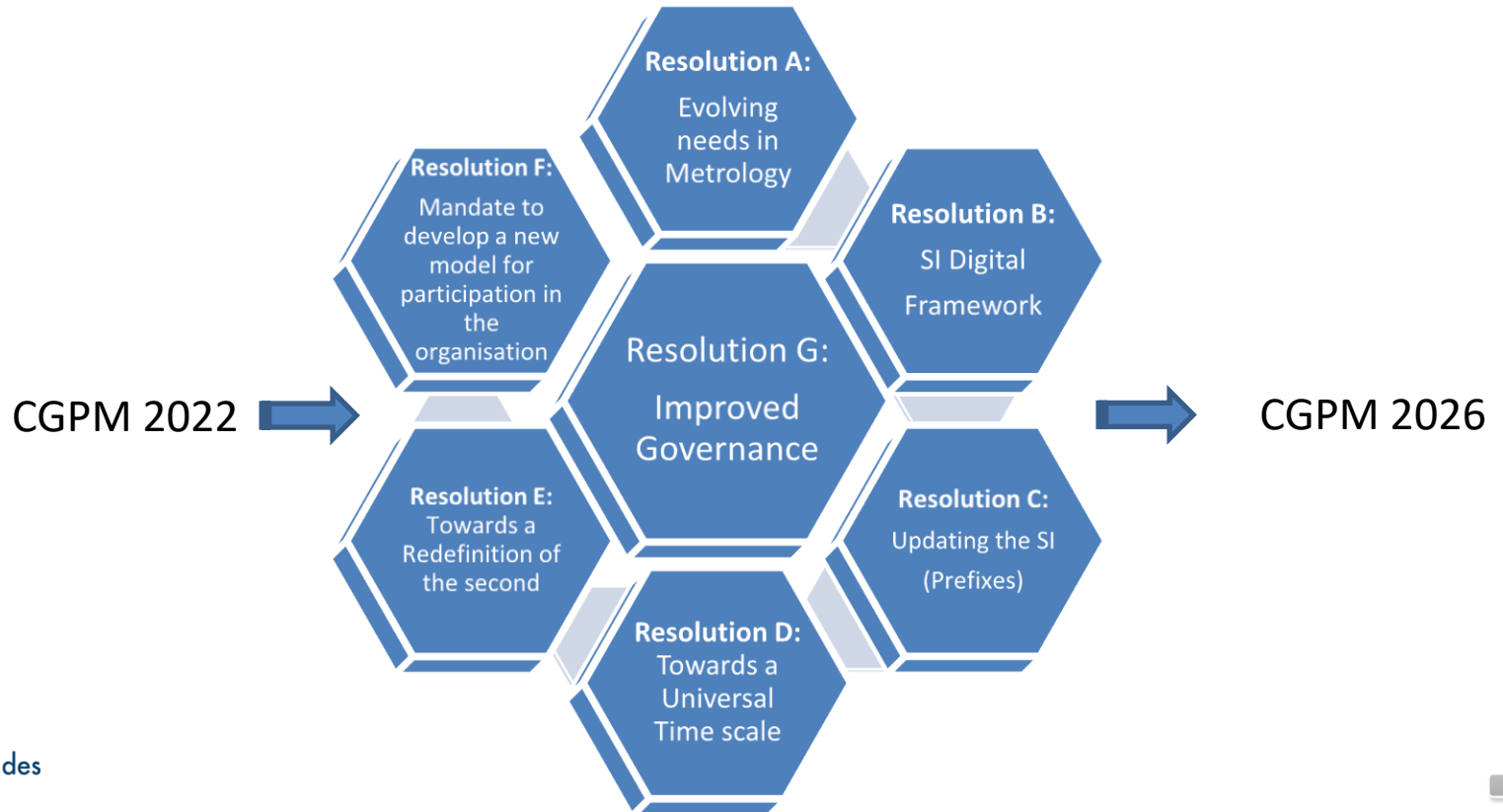
Update on the CIPM Strategy Development: Main Themes

Main emerging themes of our strategy development are:

- How we can best engage with and support addressing multidisciplinary international challenges (e.g. health, environment, energy, food security, manufacturing)
- Responding to the challenge of the digital revolution and the possibility of local realisation of the SI;
 - Digitisation of metrology - the Digital SI
 - Developing metrology to meet the challenge of the digital world (including “Systems Metrology”)
- Evolution of the SI: Ensuring UTC is globally accepted, Redefinition of the second, and the future of the Candela
- Improved liaison and cooperation with the community at large



Update on the CIPM Strategy Development: Resolutions



Strategy Activity #1: Evolving metrology needs (1)

Identified ‘Metrology Grand Challenges’:

- ◆ Climate change and environment
- ◆ Health & life sciences
- ◆ Food safety
- ◆ Energy
- ◆ Advanced manufacturing



Including two horizontal challenges:

- ◆ Digital Transformation (e.g. AI, machine-readable / -actionable information)
- ◆ “New” metrology (e.g., intrinsic standards, sensor networks, distributed measurements)

Strategy Activity #1: Evolving metrology needs (2)

Note: the present CIPM vertical structures (CCs) are not optimal for effectively addressing the new, horizontal challenges that require a multidisciplinary approach

⇒ CIPM proposal for addressing the Grand Challenges:

- ◆ *To create appropriate forums to shape and coordinate the metrology community's response to the identified grand challenges with the objective to coordinate new possibilities for metrology to have an impact on global cross-cutting measurement challenges.*
- ◆ *To start to develop a new vision for the work of the BIPM that builds on this report and should be consulted upon with the global metrology community before the 28th meeting of the CGPM expected to be in 2026. (Resolution A seeks a CGPM mandate for this work)*



Strategy Activity #1: Evolving metrology needs (3)

◆ Decision CIPM/110-10 (2021)

The CIPM decided to establish a **Sectorial Task Group on Climate Change and Environment**, as proposed by the Sub-Committee on Strategy SC1: Responding to Evolving needs for Metrology.

Dr Del Campo, Dr Sené and Dr Duan were appointed as the founding members to start the group. They were encouraged to build further momentum by seeking appropriate external expert collaborations and to promote the benefits of the work of the international metrology community with the parties at future United Nations Climate Change Conferences (known as COP)

Measurement for Climate Action Workshop

Held online, October 13th & 14th, 11:00hrs – 13:30hrs UTC

In the run up to COP26 (Glasgow, UK) NPL hosted a workshop for the international metrology community to engage with the providers and end-users of climate science. The workshop highlighted how metrology can support climate action by providing improved confidence in data.

The organisations below from the climate community collaborated to:

- Identify the most critical areas of focus for improving the quality system of climate science
- Share how metrology – the science of measurement – has already delivered impact in improving specific aspects of climate science
- Explore the potential impact of metrology capability that is currently in development
- Discuss how improvements in climate data quality could support international negotiations at COP and the ambitions of individual countries

The workshop was also used as a platform to launch the *BIPM-WMO Metrology for Climate Action* initiative, that will culminate in a workshop in 2022



The scale and breadth of the climate challenge means that there are many potential areas of collaboration between the metrology community and other disciplines to support climate action. The workshop highlighted the need to prioritize those that will deliver the greatest impact, as quickly as possible. To do this, we must ensure close, honest and critical engagement between the metrology and climate science community at the formative stages of our programmes of work, both to prioritise and shape them. The Climate Action Initiative is an important exemplar of this.



Strategy Activity #1: Evolving metrology needs (5)

◆ **Decision CIPM/110-22**

The CIPM approves the Joint Statement of Intent on the digital transformation in the international scientific and quality infrastructure and noted the intent for joint signature by OIML, CODATA and IMEKO. Other major stakeholders will be approached before the next quadripartite meeting scheduled for March 2022.

◆ **Decision CIPM/110-23**

The CIPM supports the plan for a CC survey on NMI/DI plans for digital calibration certificates and engagement with the Digital SI Framework.

Strategy Activity #2. Addressing key scientific challenges to advance the global measurement system (1)

Challenges:

How can the CIPM foster and promote international cooperation;

- 1) in response to the ***implementation of the revised SI***
- 2) towards a possible ***future revision of the SI***
- 3) in response of ***primary metrology outside the NMIs***
- 4) in response of ***the science of Systems Metrology***: the characterization of heterogeneous, large and complex systems of methods and sensors

Strategy Activity #2. Addressing key scientific challenges to advance the global measurement system (2), update

Actions:

Updated Report ready to be published for consultation

1) in response to the ***implementation of the revised SI***

- *Survey conducted by CCU on the implementation of the revised SI*
 - ✓ *Included NMIs, Liaisons and Teaching organisations*
 - ✓ *Inputs contributed to an updated CCU Strategy*

Strategy Activity #2. Addressing key scientific challenges to advance the global measurement system (4), update

Actions:

2) towards a possible ***future revision of the SI***: Four draft resolutions

- **B: *On the global digital transformation and the International System of Units*** (prepared by the CIPM D-SI Task group)
- **C: *On the extension of the range of SI prefixes*** (prepared by CCU)
- **D: *On the use and future development of UTC*** (prepared by CCTF)
- **E: *On the future re-definition of the second*** (prepared by CCTF)

Strategy Activity #2. Addressing key scientific challenges to advance the global measurement system (5), update

Actions: Work towards the following will continue in the horizontal structures;

3) in response of ***primary metrology outside the NMIs***

(issues of accreditation, traceability, remote calibration as well as the use of digital certificates (metadata); real time calibration; embedded measurements; virtual metrology and virtual standards; self-calibrating devices (“NMI-on-a-chip”)

4) in response of ***the science of Systems Metrology***

(the characterization of heterogeneous, large and complex systems of methods and sensors; validation of algorithms; etc.)

Strategy Activity #3: Deepening engagement with other international organizations on measurement science issues (1)

Signed MoUs

- BIPM-IUPAC MoU (*signed in October 2019*)
- BIPM-IFCC-ILAC Declaration of Cooperation establishing JCTLM (*re-signed in Dec 2019*)
- BIPM-ITU MoU (*signed in June 2020*)
- BIPM-IFCC MoU (*signed in September 2020*)
- BIPM-CTBTO MOU (*signed in June 2021*)
- **BIPM-CODATA** MoU (*signed in October 2021*)

BIPM-OIML:

- World Metrology Day 2021 SASO Saudi Arabia (GULFMET) '*Measurement for health*'
- World Metrology Day 2022; working with COOMET on the theme "Digital transformation"
- Joint publication OIML D1: National metrology systems - Developing the institutional and legislative framework (*Feb 2021 for BIPM*)
- Joint statement *On the digital transformation in the international scientific and quality infrastructure*

IUPAC – International Union of Pure and Applied Chemistry

IFCC – International Federation of Clinical Chemistry and Laboratory Medicine

ITU – International Telecommunication Union

CTBTO – Comprehensive Nuclear Test Ban Treaty Organization

CODATA -Committee on Data for Science and Technology



Strategy Activity #3: Deepening engagement with other international organizations on measurement science issues (2)

BIPM-ILAC:

- Joint webinar: Mining KCDB 2.0 in the context of accreditation – 600 plus attendees (21 January 2021)



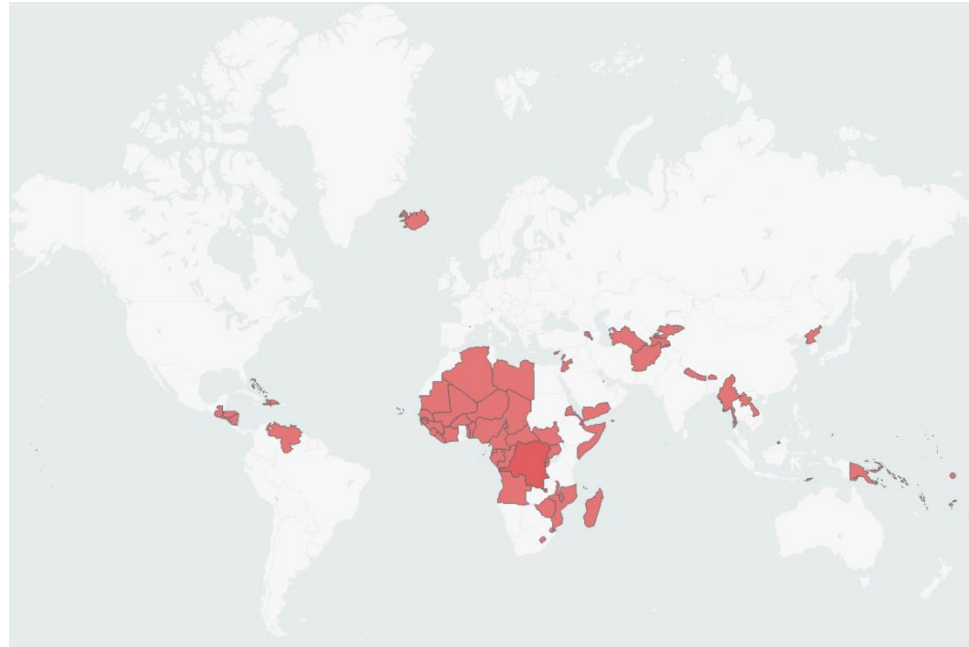
OECD:

- Contribution to the Compendium of IO practices through the IO Partnership for effective international rule-making (September 2021)
- Contribution by the BIPM Director as a member of the 'High level Panel' in the OECD virtual event : **'Rethinking and modernizing international rulemaking to design better policies for the 21st century'**



Strategy Activity #4: Reviewing the strategy for the future membership of the organisation (1)

Background: Of the 193 states listed by the UN, 83 are neither Member States nor Associate States/economies

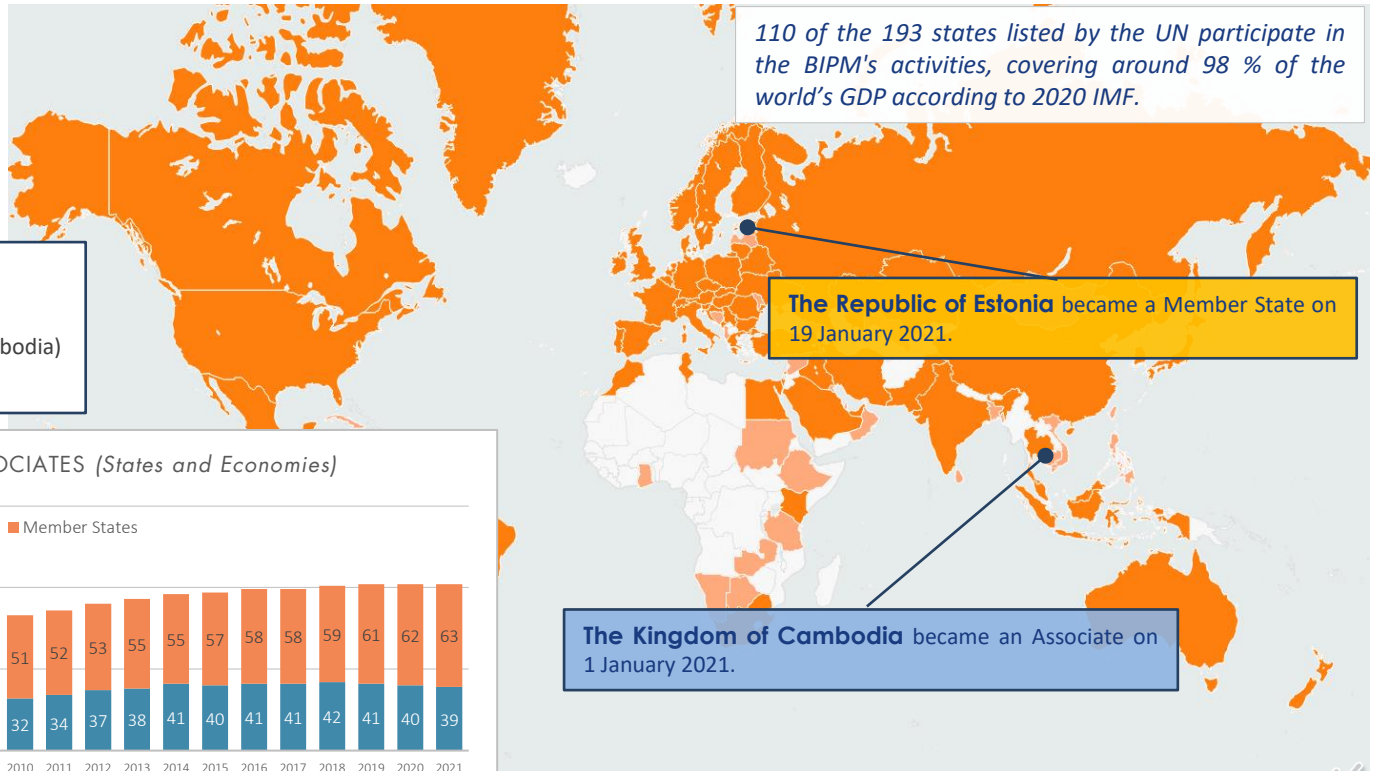


Strategy Activity #4: Reviewing the strategy for the future membership of the organisation (2)

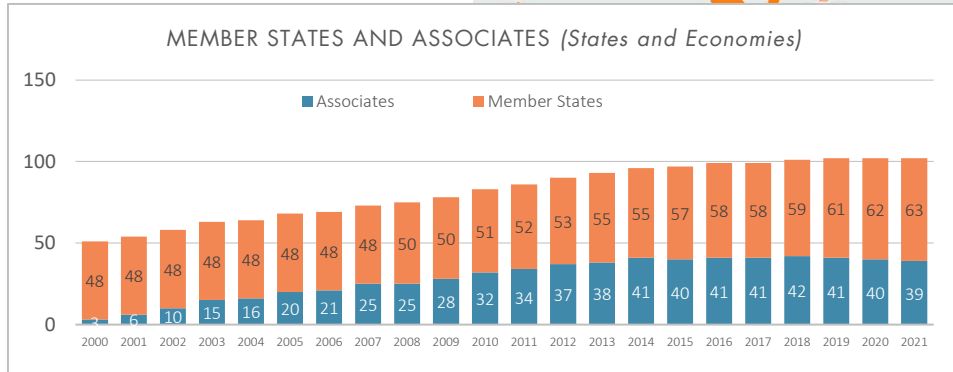
- Update: The CIPM plans to bring forward a CGPM Resolution that will seek a mandate to learn from other treaties to evaluate and explore membership models that are more inclusive;
 - *Recognise we are not trying to change the mission, role, or existing participation for signatories*
 - *Recognise this is a big step that requires careful analysis, reflection, and discussion particularly to ensure no incremental unfunded burden of effort*
 - *Recognize the need to launch the work formally after CGPM 2022*
 - *Aim to develop options and bring forward a recommended solution to the CGPM for voting in 2026*

Member States and Associates

- 63 Member States* and
- 39 Associates of the CGPM
(States and Economies)



New Member State: Estonia
New Associate of the CGPM: Cambodia
New signatory of the CIPM MRA: NMC (Cambodia)
Ceased to be an Associate: Zimbabwe



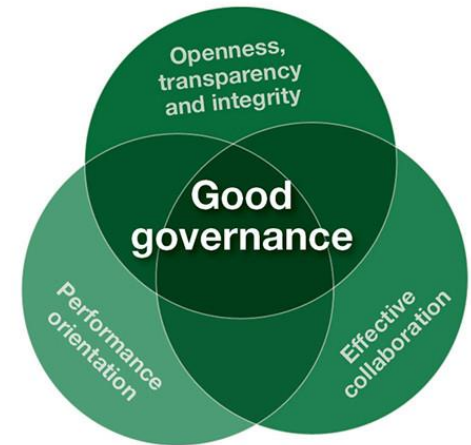
Strategy Activity #5: Modernising the Organisation

Outputs

- New CIPM Rules of Procedure approved in 2020 and updated in 2021
- Legal opinion on duties of elected office bearers

Working on:

- Code of Conduct for CIPM members
- Update of several BIPM policies
 - Open access to information
- Draft procedure regulating the conduct of the 27th CGPM



<https://www.anao.gov.au/>

Highlights from the CCs: October 2021 CIPM meetings (1)

- CCTF reported on their on-line CC meeting
 - Session 22-1: October 28-29, 2020
 - Session 22-2: March 11-12, 2021



- Roadmap towards the redefinition of the second
 - Creation + ToR of a task force with 3 subgroups:
 - A – Request from user communities and NMIs
 - B – Atomic frequency standards, and possible redefinition approaches
 - C – TF Dissemination and time scales; Update of conditions and criteria to change the definition

Highlights from the CCs: October 2021 CIPM meetings (2)

- Increased use of e-comms in CCRI catalyzed by the pandemic
- Blog/newsletter, e-learning, YouTube, Webinars
- Webinars particularly valuable (75 - 300 attendees from across the globe)
- Particularly high attendance for practical topics (e.g., introduction to ISO standard)
- Planned to make this an ongoing activity

CCRI Webinars (attendance 75 - 300)

Oct. 2020	Launch event: 60 years of IR metrology at the BIPM
Nov. 2020	European metrology network – radiation protection
Dec. 2020	The SIR
Jan. 2021	High dose-rate dosimetry
Feb. 2021	Metrology for CERN
Mar. 2021	ISO4037 (Radiological protection)
May 2021	Radiopharmaceutical therapy
Jun. 2021	The status of brachytherapy dosimetry
Oct. 2021	ICRU Report 95 (operational quantities for external radiation exposure)
Planned	Metrology for fusion, cosmic-ray dosimetry, neutron metrology. Invited talks from Liaison orgs, NMIs.



Highlights from the CCs: October 2021 CIPM meetings (3)

A roadmap for metrology of infectious disease and future pandemic readiness

Julian Braybrook

Chair, Roadmap Steering Committee & Director, National Measurement Laboratory at LGC, UK

Steering Committee Members

Jim Huggett (Chair, CCQM BAWG), Jeremy Melanson (Chair, CCQM PAWG), Jonathan Campbell (Chair, CCQM CAWG)

Daniel Burke (NMIA), Bernd Guettler & Gavin O'Connor (PTB), Lianhua Dong & Hongmei Li (NIMC), Y Bae (KRISS), Mike Tarlov, Katrice Lippa & Carlos Gonzalez (NIST), Kuliabina (VNIIMS), Ralph Paroli (NRCC),

Robert Wielgosz & Ralf Josephs (BIPM)

Objective

Develop a roadmap for metrology to support measurements associated with infectious disease and future pandemic readiness

Based on lessons learned from SARS-CoV-2 pandemic: *identification and characterisation of appropriate prognostic and diagnostic technologies, platforms and data management/integration*

Provide recommendations, and strategies for realising, specific metrology interventions that could enable a more rapid response and enhance clinical outcome for a future pandemic

Summary of CCQM Workshop 5-7 October 2021

18 senior policy or metrology officials from UK, Europe, US, Canada, Asia and Australasia led the workshop presentations and discussion

160 workshop participants from 21 countries



Future CIPM activities: Communication plan for the 27th CGPM (2022)

21st October 2021: Announcement of plans and list of Resolutions at NMI Director's/SRs meeting.

16 February 2022: 1st On-line information session for State Representatives

End-Feb 2022: Publication of Convocation and distribution through official channels

22nd -24th March 2022: Meeting of the CIPM (held in Sevres)

End of February 2022: Publication of Convocation and distribution through official channels

24 June 2022: 2nd On-line information session for State Representatives

September 2022: Publication of “final draft version” of the Work Programme and “Highlights and Notes” to support dotation discussions at the CGPM

14th-17th Nov 2022: 27th CGPM meeting held in Versailles



Thank you

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