



## 1. General Aspects

The five year terms of the four convenors came to an end in 2021 and replacements were installed:

SC DC & Quantum: Antti Manninen (FI) was replaced by Ralf Behr (DE)  
SC Low Frequency: Damir Ilic (HR) was replaced by Helge Malmbeek (NO)  
SC Power & Energy: Paul Wright (UK) was replaced by Jari Hällström (FI)  
SC RF & Microwave: Andrew Smith (UK) was replaced by Karsten Kuhlmann (DE)

The term of the TC chair will end in spring 2023. The search for candidates has been initiated.

## 2. Projects

Detailed information about the EURAMET projects in the EM field is available from the EURAMET website. An overview of the number of ongoing projects is given in the table below.

Comparisons	Traceability	Research
7	7	2

## 3. Comparisons

Five of the seven comparisons are EURAMET comparisons with a registration in the KCDB. The remaining two are pilot studies.

During the last two years, some comparisons going on for a long time or being stuck for various reasons were successfully completed. Now the oldest comparison still ongoing dates back to 2016 and it is close to draft B stage. Other than that no ongoing comparison is older than 2019.

## 4. CMCs

The CMC run EURAMET.EM.16.2019 was initiated mid-2019 and some CMCs are still in JCRB review. This run started with the old system with excel files and was then transferred to the new KCDB for the JCRB review. Significant delay was caused by the changeover between systems and by the common problems encountered with the old excel based batch system.

EURAMET.EM.17.2021 was initiated mid-2021 on the new platform. A large fraction of the approximately 100 new or modified CMCs was already published in the KCDB by early 2022.

EURAMET.EM.18.2022 has been initiated early 2022 with a submission deadline in mid-March. In the near future it is planned to maintain an annual submission cycle. This could be changed if deemed necessary.

Individual CMC management with the new KCDB platform has clear advantages over the old excel based batch system. Single problem CMCs are not holding up the entire batch anymore and a majority of CMCs can be published within months after submission. It is still necessary to keep a structured timeline for submission and review, mostly to provide planning reliability to the Reviewers and avoid overloading them.

## 5. Activities of the Subcommittees

There are 4 SCs: DC and Quantum Metrology (SC DC&QM), Low Frequency (SC LF), Radiofrequency and Microwave (SC RF&MW), Power and Energy (SC P&E). All SCs have a strong focus on organizing comparisons as part of the MRA. Furthermore they are dealing with R&D activities related to EMPIR.

SC-DC&QM and SC-P&E have a strong involvement with the newly established EMNs for Quantum Technologies and Smart Electricity Grid. In particular the SC-P&E is practically identical

to the members of the EMN for Smart Electrical Grids. This could lead to a reorganization of the sub-committee structure in the future. As of now, there is no need to change the structure. Currently the tasks of SCs and EMNs are complementary and the efficient planning of joint meetings limits overhead. In addition, the EMNs are still in their infancy and it is better to wait and see how they develop.

Calibration guidelines 7 (oscilloscopes), 12 (VNAs) and 15 (digital multimeters) are maintained by the SCs. The SC RF&MW is still in the process of updating no 7 and no 12, whereas the SCs LF and DC&QM consider an update of no 15. This will be discussed at the next SC meetings.

## **6. Participation in EMPIR / EPM**

In the 2021 EPM call new projects with EM involvement were only funded in the Normative call (2 out of 6 submitted proposals). In the Green Deal call 4 proposals were submitted but none of them was funded.

Two workshops were held to prepare for the EPM call 2022. Both meetings were online meetings, one organized by EMN-SEG in December and a follow-up in January organized by the TC-EM. The outcome was a number of project ideas, being further addressed in the PRT submission phase.

## **7. Capacity Building: Activities of the last year and future needs**

There were no specific TC-EM activities in capacity building besides the regular EURAMET initiatives.

## **8. Meetings**

All committee meetings in 2021/2022 took place online. The contact persons meeting in October/November might take place at BIM in Sofia, Bulgaria, if the pandemic and travel situation permit.

Meetings held (all online):

2021-10-20: TC-EM WG on Strategical Planning (WGSP); 12 participants, including incoming SC convenors)

2021-10-20/21: Contact person meeting (about 50 participants including 1 BoD member, one person from BIPM/KCDB, two persons from the EURAMET secretariat and a few guests from other RMOs)

2021-04-20/21: SC RF&MW meeting

2021-05-14: SC P&E meeting

2021-06-02/03: SC DC&QM meeting

2021-06-14/15: SC LF meeting

Meetings planned:

2022-10-04: TC-EM WGSP meeting in Sofia

2022-10-05/06: TC-EM contact person meeting in Sofia

The next SC meetings are planned for 2023.

## **9. Issues**

- Recommendation of the BoD related to the war on Ukraine resulted in the exclusion of Russia from one of the comparison projects.
- The COVID-19 situation still limited physical meetings.

## 10. Strategic Planning

Strategic planning of comparisons is done in the SCs. The SC DC&QM, SC LF and SC P&E have a plan in place. The SC RF&MW does not have regional loops following BIPM key comparisons and therefore less of a need for a plan. Nonetheless, a plan for comparisons on non-key quantities still should be and will be set in place.

## 11. Outlook for 2022/2023

Topics:

- CMC submission and reviews
- Update planning of comparisons
- Revision of calibration guidelines
- Preparation and coordination for EPM 2023 call
- Election of new TC chair

