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European Metrology Programme for Innovation and Research

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FINANCIAL FRAMEWORK PARTNERSHIP AGREEMENT

2021/METROLOGY/01

European Partnership on Metrology ANNUAL REPORT

2022 – Part A

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Author: Dagmar Auerbach (EURAMET Programme Manager)

Commission Project Officer: Mans Lindberg

EURAMET MSU
Phone: +44 20 8943 6666 Email: part.msu@euramet.org
www.metpart.eu

Publishable Summary

The over 600 M€ European Partnership on Metrology was established in 2021 by twenty-three participating countries and the European Union, utilising Article 185 of the European Treaty. It follows on from the European Metrology Programme on Innovation and Research (EMPIR) which held its last call for Joint Research Projects in 2020. EURAMET - the European Association of National Metrology Institutes - is the body responsible for the implementation of European Partnership on Metrology. The decision of the European Parliament and of the Council on the participation of the Union in the European Partnership on Metrology jointly undertaken by several Member States (COM(2021)0089 – C9-0083/2021 – 2021/0049(COD)) was adopted in November 2021. The legislation was published in the Official Journal at the end of November 2021 and entered into force on 1 December 2021. A Delegation Agreement or Financial Framework Partnership Agreement was signed with EURAMET on 20th September 2022 (FINANCIAL FRAMEWORK PARTNERSHIP AGREEMENT 2021/METROLOGY/01).

The core activity of European Partnership on Metrology consists of funding multi-partner transnational joint research projects to advance metrology and its applications. In view of the concentrated capacities in metrology, the core part of European Partnership on Metrology is executed by National Metrology Institutes (NMIs) and Designated Institutes (DIs) identified by the participating states.

The key differences between EMPIR and European Partnership on Metrology are the replacement of cofounding schemes as well as the closer collaboration among other partnerships within the Horizon Europe Funding scheme.

The year 2022 saw the completion of the second annual call and selection process. The two-stage process for joint research projects commenced with a call for ideas, followed by a call for proposals against the selected ideas. EURAMET launched the first stage of this call requesting ideas addressing metrology needs underpinning industrial competitiveness and research potential in January, with Stage 1 closing in February. The ideas received were prioritised by EURAMET in April, and the preparatory work for second stage dedicated call completed in June. The Stage 2 call was published & launched in June and closed at the beginning of October, addressing 55 topics which had been distilled from the best of the ideas received in Stage 1. For each of the topics published a supporting document was provided identifying the need or opportunity, the scientific objectives and potential impact.

The proposals received were checked for eligibility and then subject to independent expert evaluation at European level culminating in a Review Conference (at which the referees meet a representative of the proposing consortia). This was held at the end of November face to face and involved 109 referees, the representative for each proposal in the respective Target Programme Integrated European Metrology or Normative or Health or Research Potential or Digital Transformation and the EURAMET Management Support Unit that runs the programme. The following Tuesday, the Partnership Committee formally endorsed the recommendations of the independent referees without change. Although the referees deemed 13 of the 15 Integrated European Metrology proposals, 10 out of 15 Health proposals, 4 out of 6 Research potential proposals, 3 out of 4 Digital Transformation proposals and 9 of the 12 Normative proposals of suitable quality for support, budget restrictions were such that only the top 6 proposals in the IEM list, the top 6 proposals in the Health list, the top 4 proposals in the Research potential list, the top 2 in the Digital Transformation list and the top 7 in the Normative list were sent for ethics screening with a view to being funded. An independent observer attended the Review Conference and gave both a positive report and some suggestions for improving the process. The projects sent for ethics review cover:

For the Digital Transformation Programme:

1. Trustworthy virtual experiments and digital twins
2. Fundamental principles of sensor network metrology

For the Health Programme:

1. Uncertainty quantification for machine learning models applied to photoplethysmography signals
2. Affordable low-field MRI reference system
3. Metrology for emerging targeted alpha therapies
4. Metrology for innovative nanotherapeutics
5. Developing a metrological framework for assessment of image-based Artificial Intelligence systems for disease detection
6. Metrology for genomic profiling to support early cancer detection and precision medicine

For the Integrated European Metrology Programme:

1. Transportable optical clocks for key comparisons
2. Dissemination of the redefined kelvin
3. Primary spectrometric thermometry for gases
4. Metrology for quantum-based traceability of the pascal
5. New calibration standards and methods for radiometry and photometry after phaseout of incandescent lamps
6. Self-calibrating photodiodes for UV and exploitation of induced junction technology

For the Normative Programme:

1. Traceability in medical X-ray imaging dosimetry
2. Standardisation of Black Carbon aerosol metrics for air quality and climate modelling
3. Metrology to support standardisation of hydrogen fuel sampling for heavy duty hydrogen transport
4. Metrology support for enhanced energy efficiency in DC transportation systems
5. Metrology for wearable light loggers and optical radiation dosimeters
6. Characterisation of AC and DC MV instrument transformers in extended frequency range up to 150 kHz
7. Harmonisation, update and implementation of standards related to radiation protection dosimeters for photon radiation

For the Research Potential Programme:

1. Traceability for indentation measurements in Brinell-Vickers-Knoop hardness
2. Towards a true 8-digit digitizer
3. Improving the realisation of the kelvin by multiple fixed-point radiation thermometry
4. Development of RF and microwave metrology capability II

Formal notification including outcome, evaluation marks, ranking and the comments of the independent referees and ethics reviewers will be sent to the proposers in 2023. The list of selected projects along with the names of the referees and some basic statistics will appear on the EURAMET website on the formal announcement dates.

The EMPIR and European Partnership on Metrology are good examples of European Joint Programming - pooling national research efforts in order to make better use of Europe's precious public R&D resources to tackle common European challenges more effectively. The first stage of the call selects research areas where the stakeholder need is clear, and the metrology community have the appropriate resources to make a significant impact. The second stage is a competition where the best proposals (in terms of scientific excellence and potential impact) are chosen by independent referees. The result is collaborative European projects where critical mass is brought to bear on clear objectives, with agreed project plans and enhanced stakeholder engagement. All the participants abide by the European level independent evaluation, clearly demonstrating the true “European Research Area” nature of the programmes.

Details of the running and completed EMPIR & Partnership projects are available from the EURAMET website www.euramet.org.