

Capacity Building

An overview of the funded projects from the Targeted Programme Research Potential.

The aim of these projects to build capacity for research in less developed NMIs and DIs.

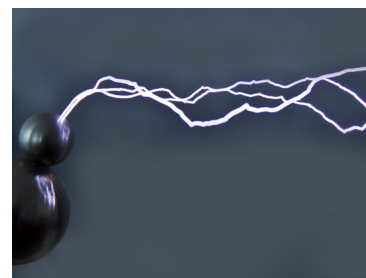
The projects underpin the coherent, efficient, sustainable and integrated development of a European metrology capacity landscape.

Towards the propagation of AC quantum voltage standards

Supporting industry through increased access to AC quantum voltage references

The Josephson effect is well established as a primary quantum standard for DC voltage, and over the last decade, there has been substantial research activity on AC quantum voltage references to meet the demand for applied AC measurements in industry and scientific research. Currently only a few NMIs in Europe have quantum standards that can be extended to other voltage levels and frequencies for use by industrial calibration laboratories.

This project will develop European measurement and research capacity by providing European NMIs and Designated Institutes (DIs) with access to AC quantum voltage references, where access to such facilities is currently limited. The increased number of NMIs using AC quantum voltage standards will facilitate the diversification of research and development of specific industrial applications across a wide range of electrical metrology. The project will also contribute to the improvement of calibration capabilities, as AC quantum voltage standards affect around 70 % of NMIs' calibration activities.



©iStock.com/Inventori

Project 14RPT01

Towards the propagation of AC quantum voltage standards

Javier Díaz de Aguilar

CEM, Spain
+34 91 807 47 66
jdiaz@cem.minetur.es

<http://acqpro.cmi.cz>

Traceable calibration of automatic weighing instruments operating in the dynamic mode

New calibration methods to support dynamic weight measurements

Automatic Weighing Instruments (AWIs), despite the increased cost, are more effective and efficient in the long term than their non-automatic counterparts. Improvements in the accuracy of AWIs means they are being used in an increasing range of both static and dynamic applications. However, the significant difference between static and dynamic measurements means that the calibration of AWIs is not as well defined. There is also limited information about the uncertainties achievable using AWIs and little documented guidance is available.

This project will develop calibration methods and uncertainty evaluation models for three categories of AWIs (including those used for weighing road vehicles in motion), which will be validated through on-site tests at end-users. Draft calibration guides based on the new methods and models will also be developed. The project also aims to increase metrology research capabilities and the expertise of emerging EURAMET member countries in the provision of reliable traceability of dynamic mass measurements.



©iStock.com/RainforestAustralia

Project 14RPT02

Traceable calibration of automatic weighing instruments operating in the dynamic mode

Matej Grum

MGRT, Slovenia
+386 1 24 42 706
matej.grum@gov.si

www.awical.eu

Matrix reference materials for environmental analysis

Improving pollution monitoring with new reference materials

Drinking water, agricultural soil, and plant and animal habitats are all at risk of environmental pollution. Increased industrialisation, the use of chemicals in agriculture and the consumption of fossil fuels drive a greater need for monitoring such pollution. However, reliable analysis of water, sediment and soil samples for the purpose of environmental pollution assessment is a significant challenge due to the complexity of samples and the low concentrations of pollutants. Laboratories performing sampling need certified reference materials (CRMs), representative of real samples, to demonstrate traceability of measurements and ensure a quality-controlled process.

This project aims to develop the capacity to produce CRMs for environmental analysis by transferring the theoretical and practical know-how between project partners and combining their skills. This will have an impact on environmental monitoring in participating countries and on the broader scientific community.



©iStock.com/LeoParizi

Project 14RPT03

Matrix reference materials for environmental analysis

Alper Isleyen

TUBITAK, Turkey
+90 262 679 6209
alper.isleyen@tubitak.gov.tr

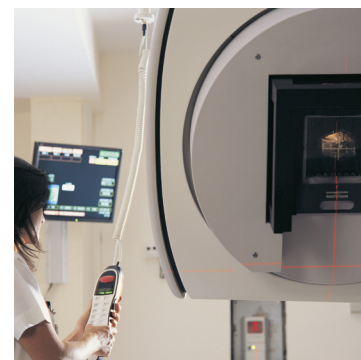
www.envcrm.com

Absorbed dose in water and air

New calibration services for improved radiotherapy treatment

As the number of cases of cancer increases, current high levels of demand for diagnostic radiotherapy and interventional radiology/cardiology procedures are set to grow. The goal of radiotherapy is to kill tumour cells, while minimising damage to the surrounding healthy tissue; however, small percentage changes in a radiotherapy dose can significantly increase the risk of complications. Uncertainty requirements for radiotherapy doses are difficult to achieve due to the disparity between calibration and treatment conditions. National laboratories need to launch calibration services which meet the needs of end-users.

This project will study the design of primary dosimeter standards, enabling participating NMIs and DIs to build their own primary dosimeter standards for diagnostic and interventional radiology/cardiology and the radiotherapy application of ionizing radiation. By decreasing uncertainties and harmonising calibration methods, the project will lead to a better knowledge of doses due to diagnostic irradiation and better treatment outcomes for patients.



©iStock.com/griane

Project 14RPT04

Absorbed dose in water and air

Jean-Marc Bordy

CEA, France
+33 1 69 04 41 89
jean-marc.bordy@cea.fr

Developing traceable capabilities in thermal metrology

Increasing knowledge and facilities for more efficient industrial processes

Over 60 % of the processes used in Europe's manufacturing industry depend on the accurate measurement of the thermal properties of materials. Advanced thermal metrology is therefore a key factor for improving the efficiency and environmental impact of industrial processes. Europe has several NMIs specialising in the field of thermal metrology, but in order to accelerate economic growth across Europe, this expertise needs to be shared more widely.

This project will increase knowledge transfer and improve the availability of facilities in the field of thermal metrology (i.e. high temperature contact thermometry, non-contact thermometry and thermophysical properties characterisation) to emerging European NMIs, where such access is currently limited. The enhanced measurement capability provided through the project will help to sustain the economic competitiveness of European member states.



©iStock.com/Knotenkolodymyr

Project 14RPT05

Developing traceable capabilities in thermal metrology

Jean-Remy Filtz

LNE, France
+33 1 30 69 12 15
jean-remy.filtz@lne.fr

www.eura-thermal.org

Europe's National Measurement Institutes working together

The majority of European countries have a National Measurement Institute (NMI) that ensures national measurement standards are consistent and comparable to international standards. They also investigate new and improved ways to measure, in response to the changing demands of the world. It makes sense for these NMIs to collaborate with one another, and the European Association of National Metrology Institutes (EURAMET) is the body that coordinates collaborative activities in Europe.

The European Metrology Programme for Innovation and Research (EMPIR) follows on from the successful European Metrology Research Programme (EMRP), both implemented by EURAMET. The programmes are jointly funded by the participating countries and the European Union and have a joint budget of over 1000 M€ for calls between 2009 and 2020. The programmes facilitate the formation of joint research projects between different NMIs and other organisations, including businesses, industry and universities. This accelerates innovation in areas where shared resources and decision-making processes are desirable because of economic factors and the distribution of expertise across countries or industrial sectors.

EURAMET wants to involve European industry and universities at all stages of the programme, from proposing Potential Research Topics to hosting researchers funded by grants to accelerate the adoption of the outputs of the projects.

EURAMET e.V.
Bundesallee 100
38116 Braunschweig
Germany

Full details can be found at:
www.euramet.org
Dr Duncan Jarvis
EMRP Programme Manager
E-mail: emrp-pm@euramet.org
Phone: +44 20 8943 6707



The EMPIR initiative is co-funded by the European Union's Horizon 2020 research and innovation programme and the EMPIR Participating States

Publication date: September 2015