



# Standardisation (Call 2015) - Projects

An overview of the set of projects funded under the Targeted Programme Pre- and Co Normative research.

The aim of these projects is to develop metrological methods and techniques required for standardisation.

Focus is placed on both the specific documented demands of European and international Standards Developing Organisations (SDOs) and with a potential for high impact on European standardisation.

## Super-sensitive emissions monitoring

Validation of sulphur dioxide measurement methods will lay the foundation for future-proof emissions monitoring

Sulphur dioxide, emitted during the combustion of solid fuels, has long been recognised as a pollutant which can have adverse effects on human health, aquatic ecosystems in rivers and lakes, and forests, crops and other vegetation. Recognising the large economic and societal burden, the EU places increasingly stringent limits on emissions of sulphur dioxide through the Industrial Emissions Directive (IED), which is projected to prevent 13 000 premature deaths and 125 000 years of life lost. Successful implementation of the IED relies on an underpinning measurement capability which enables regulators to enforce it. However, existing Standard Reference Methods (SRMs) for the measurement of sulphur dioxide emissions are no longer fit for purpose at the low levels permitted by the latest iteration of the IED. This project will test the performance of existing and alternative SRMs, in both the lab and the field, putting in place the foundation needed to develop a new SRM for robust regulatory monitoring of sulphur dioxide emissions from industrial processes.



### Project 15NRM01

Metrology for sampling and conditioning SO<sub>2</sub> emissions from stacks

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## Ultra-high voltage measurement techniques

New research will underpin testing of ultra-high voltage equipment used across a range of industries

This project will support the standardisation of ultra-high voltage measurement techniques, focussing on the needs of three different industrial sectors. One part of the project will focus on high-voltage measurements for medical X-ray equipment. The traceable measurements of practical peak voltage and exposure time provided by the project will ensure a better control of the dose delivered by X-ray units used in fields such as radiology, mammography and dentistry. This will help to ensure good diagnostic performance while keeping radiation doses to patients to a minimum. Another aspect of the project will focus on measurements of partial discharge in high-voltage power systems. The capabilities developed will improve the reliability of the power supply from high-voltage direct-current transmission lines, which are increasingly being deployed across Europe due to the low-loss, long-distance energy transmission offered. Finally, the project will provide new calibration methods for fast transient sensors, to address the needs of the electrical power industry.



### Project 15NRM02

Techniques for ultra-high voltage and very fast transients

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## Quality-assured fuel for hydrogen cars

Improved hydrogen purity measurements will support the rollout of reliable fossil-free transport

Hydrogen represents a clean and storable energy solution that could play a major role in helping Europe meet its energy demands while reducing greenhouse gas emissions. Hydrogen-powered vehicles are emission-free at the point of use and fossil fuel usage can be eliminated completely if the hydrogen is generated from renewable energy sources. However, the fuel cells that power hydrogen vehicles can degrade quickly if even trace levels of impurities are present in the hydrogen supply. Recognising the significance of this, the European Commission introduced a Directive in 2014 requiring all hydrogen used to power vehicles to comply with strict purity requirements. This project will develop improved hydrogen quality specifications for fuel cell vehicles together with analytical techniques to enable traceable measurements of hydrogen impurities. The outputs will be used to revise two existing ISO standards, which are currently too generic for the rapidly expanding range of hydrogen-energy applications, to ensure they address the needs of this burgeoning sector.



### Project 15NRM03

Metrology for sustainable hydrogen energy applications

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## Supporting smart, stable grids

Improved measurements of rate-of-change of frequency will provide vital support to the smart grids of the future

The Renewable Energy Directive requires the EU to fulfil at least 20 % of its final energy consumption with renewable sources by 2020. Future electricity networks incorporating such a large proportion of renewable sources will be subject to intermittent generation and require new instrumentation that can successfully balance supply and demand to prevent blackouts and poor power quality. Rate-of-change of frequency (ROCOF) is an essential measurement that such grid control systems depend upon to ensure the continuity and quality of electricity supply. However, ROCOF measurements are challenging, as they are highly susceptible to the disturbances experienced in typical electricity networks. Many measurement techniques have been proposed, yet despite the vital nature of this parameter, no appropriate standardisation for ROCOF testing exists. This project will build on the achievements in EMRP projects ENG04 SmartGrid and ENG53 SmartGrid II to review, develop and optimise algorithms to measure ROCOF over the full range of network conditions, and develop compliance test protocols, to support the development of a ROCOF standard.



### Project 15NRM04

Standard tests and requirements for rate-of-change of frequency (ROCOF) measurements in smart grids

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## Europe's National Measurement Institutes working together

The majority of European countries have a National Metrology 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.



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