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RESEARCH SUMMARY OF THE EMPIR METRORADON PROJECT

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The aim of this joint research project –carried out in the frame of the European Metrological Programme for Innovation and Research (EMPIR) coordinated by EURAMET –is to develop reliable techniques and methodologies to enable SI traceable radon activity concentration measurements and calibrations at low radon concentrations including geographical radon mapping beyond the state of the art. The results of the project will be targeted at the implementation of the European Council Directive 2013/59/EURATOM (EU BSS), one aim of which is to reduce the risk of lung cancer for European citizens due to high radon concentrations in indoor air. The calibration and measurement techniques and radon mapping methods developed in the project will assist EU member states in the establishment of their national radon action plan, which is required under the EU-BSS.

The scientific outcome of this research will help to establish a basic European metrological infrastructure for radon measurements enabling sound monitoring of radon and radon protection in Europe. In addition to the 17 European consortium members the project currently has 9 collaborators representing academic and public organisations. The strong engagement of about 150 stakeholders from manufacturers of radon monitoring equipment, companies offering radon measurements, calibration facilities, national authorities charged with the implementation of the EU Basic Safety Standards into national law, and international bodies is key to the successful implementation of the project's results.

In this paper, a comprehensive overview on the generated research results beyond the state of the art is given based on the working structure of the joint research project: (1) procedures for traceable calibration of ^{222}Rn instruments at low activity concentrations, (2) reducing the influence of ^{220}Rn on ^{222}Rn measurements and calibrations, (3) comparison of existing radon measurement procedures in different European countries and optimisation of the consistency of indoor radon measurements and soil radon exhalation rate measurements, (4) methodologies for the identification of radon priority areas and investigation of the relationship between soil radon exhalation rates and indoor radon concentrations, (5) validation of the traceability of European radon calibration facilities, and guide-lines on calibration and measurement procedures for the determination of radon concentration in air.

The project's outputs and data will benefit European and international standards on radon monitoring, radon measurement and calibration, geographical radon mapping, and guidelines on radiological protection, construction products, radiation instrumentation and nuclear data.

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