Publishable Summary for 20NET03 POLMO
Support for a European Metrology Network on pollution monitoring

Overview

The EU has highlighted the need for high quality data to support Europe's progress towards a zero-pollution ambition. This project will define the scope of a future European Metrology Network (EMN) for pollution monitoring in the fields of air, water and soil, focussing initially on chemicals, biologicals and radionuclides pollution. It will achieve this through the development of a strategic research agenda and an extensive programme of knowledge sharing in liaison with stakeholders, with particular focus on existing networks and partnerships, European agencies and organisations as well as standards developing organisations. Through the creation of the EMN-PolMo, the project aims to establish a long-term ongoing dialogue between the metrology community and its various stakeholder communities.

Need

The EU's Green Deal (COM/2019/640) acknowledges that "the EU needs to better monitor, report, prevent and remedy pollution from air, water, soil, and consumer products and to look more systematically at all policies and regulations". In order to address these challenges, the Commission launched a new Chemicals Strategy for Sustainability in October 2020 and adopted a Zero-pollution Action Plan for air, water and soil in 2021. There is an increasing awareness on chemicals contamination of the environment. The very low number of pollutants that are currently regulated or monitored shows that we do not yet have a complete overview of chemicals, biologicals and radionuclides in the environment and their possible impacts. Moreover, in some cases, measurement procedures sufficiently sensitive to monitor such pollutants at the relative levels and also able to provide representative measurements are non-existent, too expensive or undocumented.

Comparability and reliability of measurements are often compromised by a lack of traceability chains and appropriate quality control (such as matrix-matched certified reference materials and interlaboratory comparisons), validation schemes, standardisation or standard operating procedures. There is a need to demonstrate and convince stakeholders of the importance of traceability to the SI in the field of environmental science.

Bridging the gap between metrology and end-user communities, including citizens and non-governmental organisations, goes beyond the designated current activities of National Metrology Institutes/Designated Institutes (NMIs/DIs) and Technical Committees under EURAMET and CIPM. Measurement capabilities of individual NMI/DIs, calibration and testing organisations (laboratories, proficiency tests providers, standardisation and accreditation bodies, etc.) and networks/organisations are fragmented. End users (regulatory bodies, environmental agencies, citizens, industries) need to be able to find information easily and to understand "who is doing what".

The scale of the challenge - responding first to all chemicals and radionuclides and later to other pollutants (e.g. noise, light) or compartments (human) - requires increased European coordination of metrological capabilities to ensure that all priority requirements can be addressed. An EMN providing a sustainable metrological foundation to address environmental pollution is necessary to bridge these gaps. This project and the related EMN will promote the development of multidisciplinary research, going beyond current regulations, which focus on specific categories of pollution or fields (eg air, water). More broadly, the project aims to lead to the more accurate assessment of environmental and human risks in relation to the occurrence of pollutants in the wider environment based on more reliable measurement data. It will allow public authorities to report to the commission data with a greater level of confidence and to communicate better information to the public on the real state of pollution of the environment. The project will also facilitate better understanding of open source and self-monitoring data through its training aimed at citizens and non-governmental organisations.

Objectives

The overall goal of this project is to support and accelerate the establishment of the EMN on pollution monitoring, by developing a long-term ongoing dialogue between the metrology community and relevant stakeholders. This dialogue will support the uptake of metrological research and the development of focussed roadmaps including stakeholder requirements to inform future research.
This project has the following specific objectives:

1. To identify and establish regular dialogue between the project and all stakeholders in the fields of pollution monitoring, including air quality, water quality, soil pollution. This will encompass existing networks e.g. AQUILA, NORMAN, EURDEP, ESDAC and WMO-GAW, as well as standards developing organisations e.g. CEN and ISO. This should include not only fostering existing liaisons, but also promoting new collaborations and identifying stakeholder needs.

2. To develop a Strategic Research Agenda (SRA) and roadmaps for pollution monitoring that combine an integrated, multidisciplinary approach with traceable metrology solutions (e.g. certified reference materials). This will take into account feedback and the metrological needs of stakeholders identified in objective 1 and include measures to support innovation, assist competitiveness, ensure comparability and prioritise future research.

3. To develop a web-based platform for stakeholders in the fields of pollution monitoring that provides a single point of contact for their metrological needs. The platform will provide easy access to European metrology capabilities, relevant metrological tools and pollution regulation requirements in order to support decision-making and identify gaps in current NMI/DI measurement services. The platform will be developed in a manner that allows it to be maintained by a future EMN.

4. To set up a knowledge-sharing programme for pollution monitoring metrology, to promote the dissemination and uptake of information, particularly with existing networks e.g. AQUILA, NORMAN, EURDEP, ESDAC and WMO-GAW. This will include a range of activities organised by the project, such as the exchange of researchers between organisations, metrology workshops, interdisciplinary studies and training courses.

5. To develop a plan for a multidisciplinary and sustainable European infrastructure via a European Metrology Network for pollution monitoring. The plan will be completed within 12 months of the start of the project and will: (i) identify the scope of the EMN, with respect to the remits of other EMNs, ii) include proposals for coordination and smart specialisation of capabilities, (iii) align with other running initiatives and projects, (iv) promote the development of emerging member states, and (v) consider how to extend collaboration to third countries.

Results

Objective 1: Engagement with stakeholders and stakeholder needs review

The ongoing stakeholder dialogue set up in this project and continued as part of the EMN will be based on thorough analysis of the relevant stakeholder communities involved in pollution monitoring. Potential stakeholders (>200) in the field of environmental pollution monitoring, including existing networks, regulators and their associated organisations, standards development organisations, research organisations and excellence centres, academia, industry (e.g. classified facilities for environmental protection) and measurement service providers, were identified. Stakeholder mapping exercise was organised by EURAMET and partners have identified the priority stakeholders of the network. The project will use this as the basis for the collation of stakeholder requirements. A questionnaire was sent to about 100 stakeholders to identify their metrological needs in the fields of air quality, water quality, soil pollution. Stakeholders' responses have been analysed and a deliverable will be available in the coming months.

Objective 2: Development of an SRA and roadmaps for pollution monitoring

The project will identify metrology needs from pollution monitoring stakeholder communities, including an in-depth analysis of existing regulations at EU and Member State level. A gap analysis of existing European metrology capabilities in NMIs and DIs such as calibration, testing services and traceability chain of measurements is progressing well. It has become apparent that this constitutes an extensive dataset, and

work is ongoing to break down, evaluate, and understand the data. This will provide a sound foundation for the development of a sustainable SRA for metrology applied to pollution monitoring. The draft SRA will be reviewed by key stakeholders and members of the EMN. The intention is to use this SRA to steer the development of new metrology technologies to support innovation and services within NMIs/DIs in close collaboration with other scientific communities and standardisation providers. Cooperation with key stakeholders including relevant EURAMET technical committees will support the preparation of consistent roadmaps to support the implementation of the SRA. A questionnaire based on the stakeholders' questionnaire addressed to EMN members was developed to carry out a review of the existing metrology capabilities of the EMN. The questionnaires sent to stakeholders and EMN members will be used to the drafting of the SRA.

Objective 3: Web-based platform and single point of contact

The project is developing a web-based platform for stakeholder communities involved in pollution monitoring that will provide a one-stop-shop for information on existing metrology capabilities offered by NMIs/DIs to support the environmental monitoring requirements of European regulation. Links to other relevant European and international networks will also be included in order to improve sharing of information between stakeholders, promote good practice in metrology and prevent duplication of work. Reports on the platform content and functional specifications, and service desk requirements were prepared. Summary report describing the administrative, technical, content and functional specifications of the web-based platform was prepared. The web-based platform content was agreed by project partners and EURAMET. A text for substantial parts of the platform was sent to EURAMET. EURAMET is organizing creation of the platform by a specialised company.

Objective 4: Knowledge-sharing programme

The project will develop a framework to encourage wider dissemination and uptake of information and better understanding of metrological aspects of pollution monitoring. Activities to promote collaborative approaches and new synergies between stakeholders including training workshops, interlaboratory comparisons, exchanges of researchers, and metrology-driven peer reviews of significant research results will be created. Specifically, three trainings, two workshops and one interlaboratory comparison will be developed in cooperation with stakeholders.

Objective 5: Plan for a multidisciplinary and sustainable EMN on pollution monitoring

The project has formulated a detailed plan for an EMN on pollution monitoring that was submitted to EURAMET General Assembly. Work package activities have been organised to present the required critical mass of information: (i) portfolio of stakeholders and needs (objective 1), (ii) comprehensive list of information regarding existing metrology capabilities, gap analysis and SRA (objective 2) and (iii) results of the systematic analysis of different areas addressed (identify the scope of the EMN, with respect to the remits of other EMNs, use coordination and smart specialisation of capabilities, alignment with other running initiatives and projects, the development of emerging member states, and consider how to extend collaboration to third countries). The detailed plan for an EMN on pollution monitoring has been accepted during EURAMET General Assembly in June 2022. To date, 23 NMIs/DIs and public laboratories have signed the EMN Memorandum of Understanding**.** The first General Assembly was held in February 2023 in the presence of EMN members and stakeholders involved in pollution monitoring.

Impact

The impact of this network project can be measured by the outreach activities has completed in order to inform metrologists in chemistry, biology and Ionizing radiation communities and the EMN for Pollution monitoring. So far this has included presentations by members of the consortium to conferences, standards and regulatory bodies such as CIM 2021 and 2023, DNAQUA, Eurachem, CCQM OAWG, EURAMET TC-IR, EURAMET TC-MC, the German network for metrology in chemistry, IMEKO TC24 2022, Gas Analysis 2022 and Metrology for Climate Action 2022.

The main impact of the project will be the implementation of a self-sustaining EMN on pollution monitoring. This network will provide measurement science expertise to European regulators and will support the EU Action Plan Towards a Zero Pollution Ambition for air, water and soil which was adopted by the Commission in 2021. It will provide expert measurement advice in consultations to support the development and revision of regulation, establish science to policy dialogue with other stakeholders via the development of common research program and projects. It will also set up a web-based platform that will provide a one-stop-shop for

information on existing metrology capabilities offered by NMIs/DIs to support the environmental monitoring requirements of European regulation. The EMN will provide a bridge between research and end-user communities to act as a central point of contact for measurement science advice and services whilst promoting the results of EMPIR and European Metrology Partnership projects aligned with pollution monitoring. The EMN will provide political stakeholders with a clear overview of how measurement science supports current and future regulatory compliance and the contribution of EURAMET funded research programmes to meet the aims of the zero pollution Action Plan.

With this project, European NMIs/DIs will create a new approach to meet stakeholders' challenging requirements. The Stakeholder Needs Review and SRA documents produced will ensure that stakeholder priorities are addressed and that Europe – its industry and organisations – is at the forefront of innovation and international efforts to control pollution in the environment whilst maximising societal and commercial benefit. The greater dissemination of NMI/DI driven research activities resulting from the EMN will provide a toolbox for all organisations involved in the measurement chain from monitoring networks and their suppliers to regulators and agencies responsible for regulatory compliance.

The project will provide a robust definition of the role of metrology in the European research area of pollution monitoring and demonstrate its benefit through the establishment of knowledge-sharing programmes with main European networks and partnerships. The dedicated strategies included in the communication plan and knowledge-sharing programme aimed at standard development organisations will maximise and accelerate the dissemination of reliable metrology practices for pollution monitoring through mutually recognised and agreed approaches. It will also help the coordination of European NMIs/DIs "speaking with one voice" towards these bodies allowing a better, stronger influence of metrology on a European scale. The full impact of this project will be achieved once a self-sustaining EMN is established that provides ongoing sustainable metrology support for pollution monitoring, with a single focal point for access to NMI expertise, discussions, research and services for stakeholders.

<table>
<tr><td colspan="2">Project start date and duration:</td><td>1st June 2021, 36 months</td></tr>
<tr><td colspan="3">Coordinator: Bertille Bonnaud, LNE Tel: +33 (0)1 40 43 37 21 E-mail: bertille.bonnaud@lne.fr
EMN website address: https://www.euramet.org/european-metrology-networks/pollution-monitoring</td></tr>
<tr><td>Internal Funded Partners:
1. LNE, France
2. BAM, Germany
3. CEA, France
4. CMI, Czechia
5. IMBiH, Bosnia and Herzegovina
6. LGC, United Kingdom
7. SYKE, Finland
8. TUBITAK, Türkiye</td><td>External Funded Partners:</td><td>Unfunded Partners:
9. PTB, Germany</td></tr>
</table>