

State of the art on metrology and standardisation needs to support EU regulations

**Metrology for Regulation – Open public
Consultation**

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**EUROPEAN
METROLOGY
NETWORKS**



**POLLUTION
MONITORING**

European Metrology Networks (EMN's)

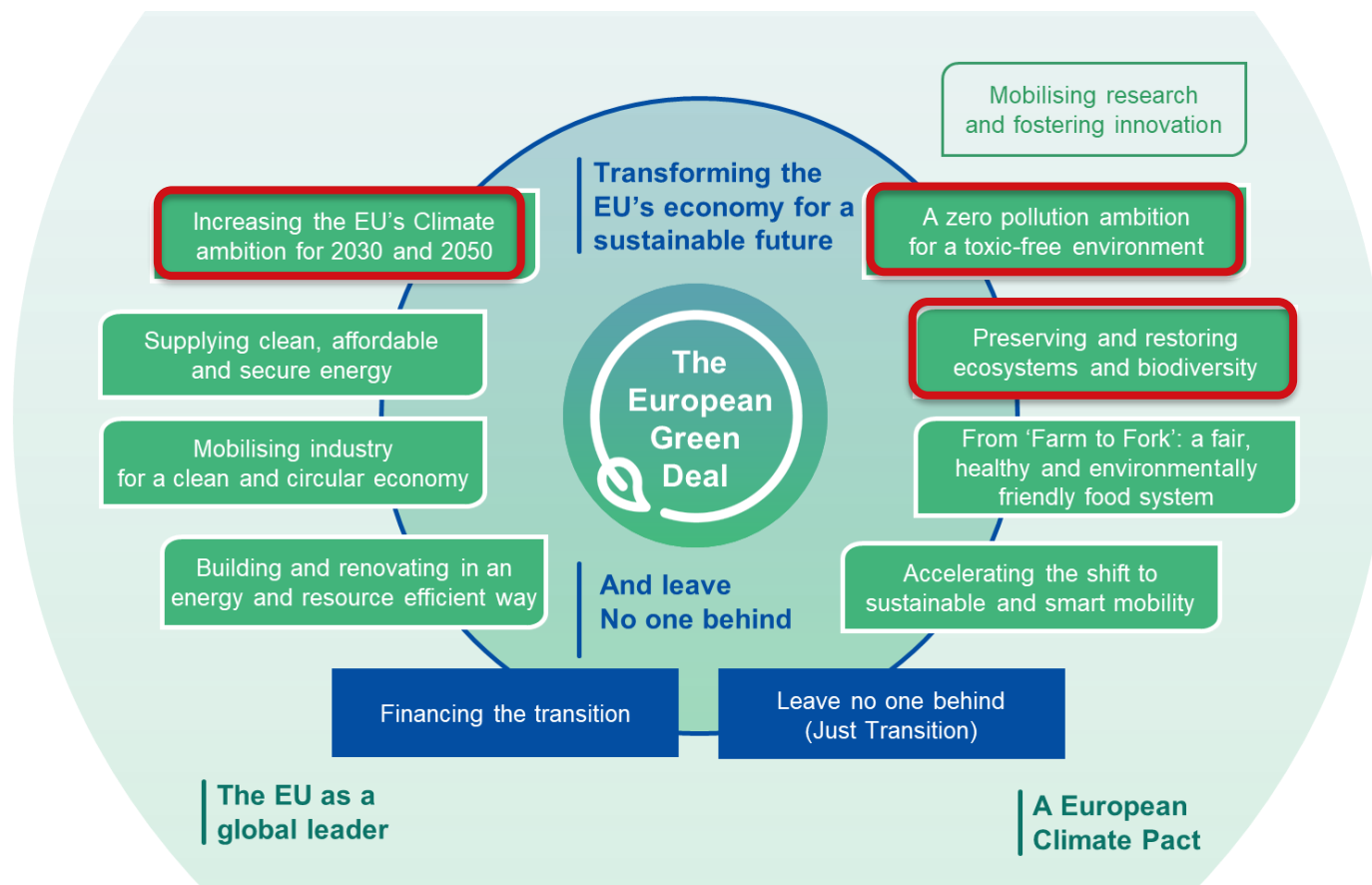
The overall objective is to **create sustainable structures in areas of strategic importance for the future of European metrology.**



EMNs...

- cover an area of major strategic importance, with **European dimension**;
- consist of a core network of NMIs/DIs with a **clear commitment** to contribute to the network;
- establish close links to a wider **stakeholder community**;
- strive for **scientific excellence**;
- plan the activities based on a **strategic agenda**;
- establish a **knowledge, technology transfer and promotion plan**;
- plan for **sustainable structures**;
- develop and coordinate **common infrastructure** if needed

EMN PolMo: A network in line with European strategies



<https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52019DC0640&from=ET>

Our vision: *“To become a sustainable infrastructure providing metrology tools to underpin European regulation and directives targeting pollution monitoring”*

Our mission « *To coordinate metrology research activities of its members in environmental monitoring and support the improvement of measurement capabilities and networking in order to reduce pollution across Europe as well as respond to societal needs»*

SECTION WATER



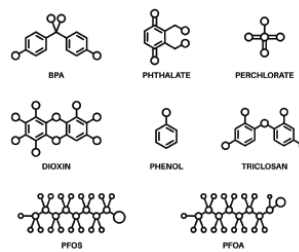
SECTION AIR



SECTION SOIL/LAND



TRANSVERSAL TECHNICAL THEMATICS



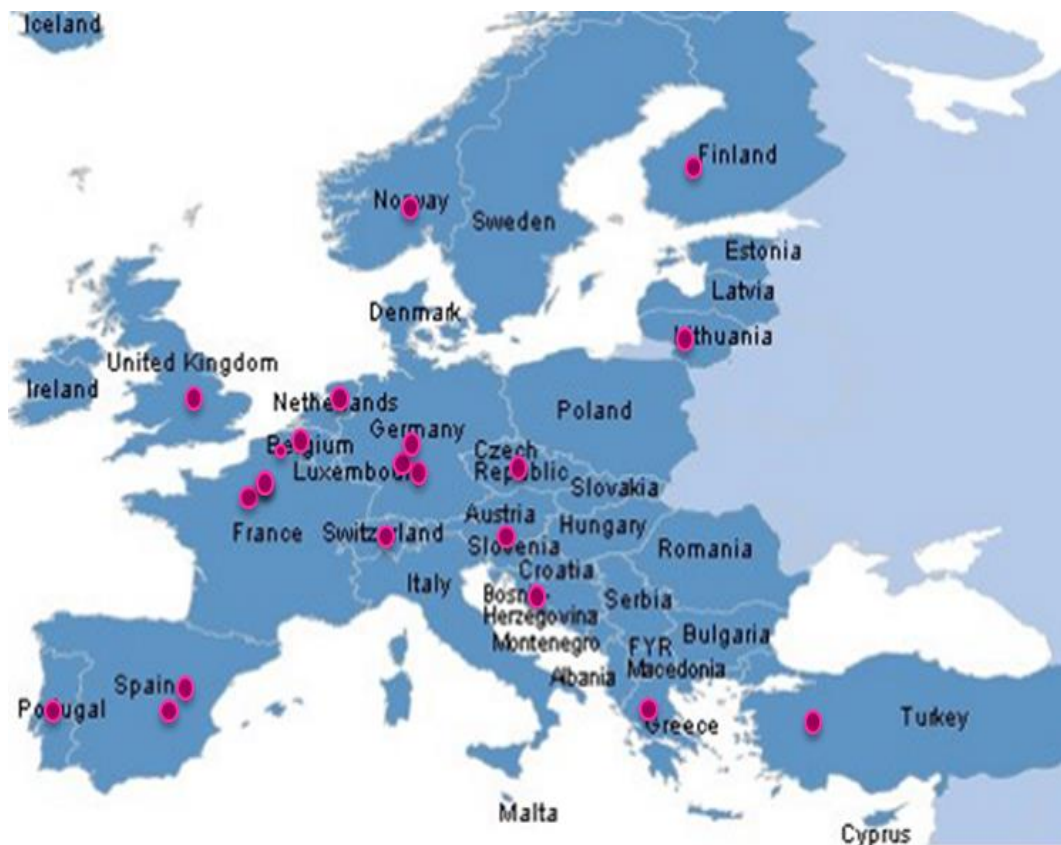
OTHER TRANSVERSAL THEMATICS



EMN PoIMo - Members

Approved in June 2022 by Euramet

23 National Metrology Institutes / Designated Institutes members



LABORATOIRE
NATIONAL
DE MÉTROLOGIE
ET D'ESSAIS

LNE

NPL
National Physical Laboratory

IRB Institut
Ruđer
Bošković

**Umwelt
Bundesamt**

IPO

PTB
Physikalisch-Technische Bundesanstalt
Nationales Metrologieinstitut

MI CZECH
METROLOGY
INSTITUTE

**Jožef
Stefan
Institute**

IMBIH

**FIZINIŲ IR
TECHNOLOGIJŲ MOKSLŲ
CENTRAS**

BAM

**Finnish
Environment Institute**

LGC

VSL
Dutch
Metrology
Institute

economie
FPS Economy, S.M.E.s, Self-employed and Energy

CEM
CENTRO ESPAÑOL
DE METROLOGÍA

**UMI
UNE**

EXHM

METAS

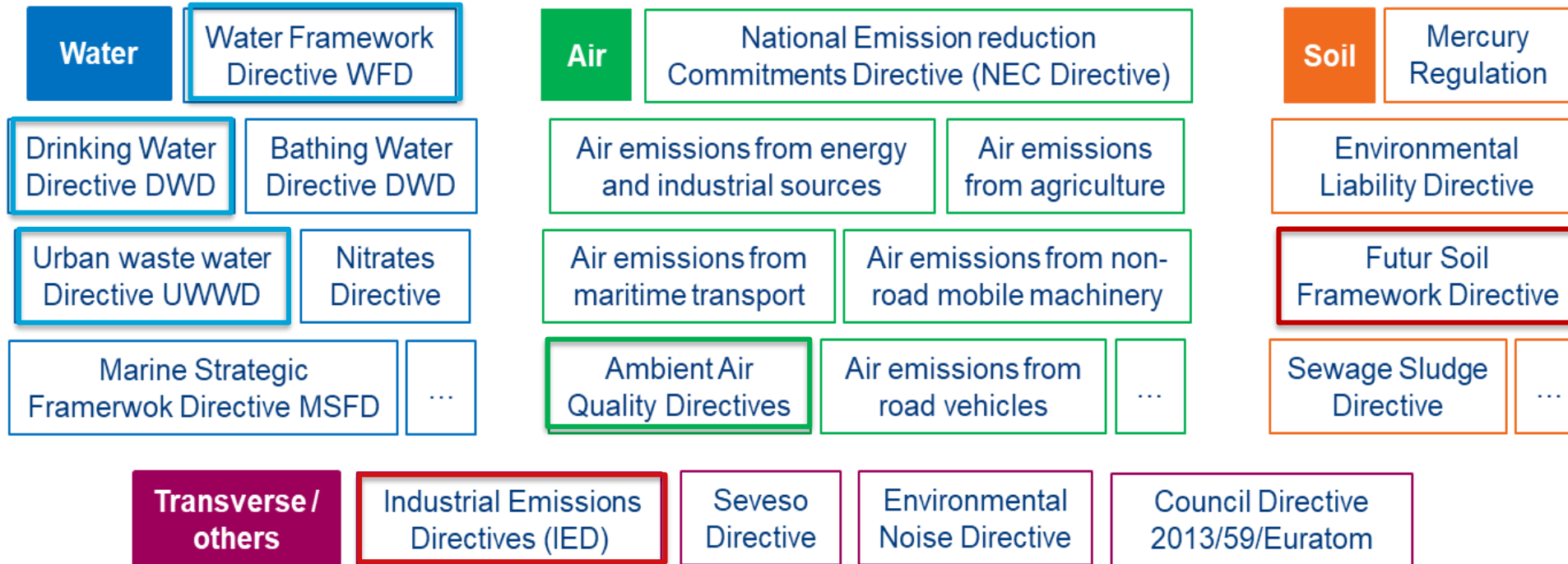
DSA Norwegian
Radiation and Nuclear
Safety Authority

sck cen

FINNISH METEOROLOGICAL INSTITUTE

hidrográfico
marinha • portugal

Overview of EU regulations in Environment



Key Directives newly revised or under revision (Oct 2022 & July 2023):

Soil – SFD

Water – DWD (2021), WFD, UWWD

Air – AAQD

Transverse - IED

EU Soil Strategy for 2030

Over 60% of European soils are unhealthy

Soils are further degrading due to unsustainable management of the land, sealing, contamination and overexploitation, combined with the impact from climate change and extreme weather events.



Sets out a framework and concrete measures for the **protection, restoration and sustainable use of soils**, in synergy with other **European Green Deal** policies.



Sets a **vision and objectives** to achieve **healthy soils by 2050 with concrete actions by 2030**.

Announces a new **Soil Health Law**

by 2023 to ensure a level playing field and a high level of environmental and health protection, complementing the upcoming Nature Restoration Law.



- Some key actions:
 - To make sustainable soil management
 - To boost circular economy
 - To restore degraded soils and remediate contaminated sites
 - Increase research as well as data and monitoring on soil
 - To mitigate and adapt to climate change

EU Soil Strategy for 2030

The proposal puts in place a solid and coherent soil monitoring framework:

- **Lack of comprehensive and harmonized data** on soil health from soil monitoring.
- Some Member States have soil monitoring schemes in place, but they are fragmented, **often not representative and not harmonised**.
- Member States apply different sampling methods, frequencies and densities, and use different metrics and analytical methods, resulting in **a lack of consistency and comparability across the EU**.

Soil Descriptors	Reference methodology	Minimum methodological criteria
<p>Concentration of heavy metals: As, Sb, Cd, Co, Cr (total), Cr (VI), Cu, Hg, Pb, Ni, Tl, V, Zn</p> <p>Concentration of a selection of organic contaminants defined by Member States and taking into account existing EU legislation (e.g. on water quality or pesticides)</p>	<p>Potential environmental available content of heavy metals in soils based on ISO 17586:2016 using dilute nitric acid.</p>	<p>Use European or International standards when available; if such standard is not available, the methodology chosen shall either be available in the scientific literature or publicly available</p>

Water Directives

- 1975-1986: first series of directives
 - Surface waters
 - Bathing waters
 - Discharges of hazardous substances in surface and groundwater
 - Quality of water intended for human consumption
 - ...
- From 1991 to 2013: second phase
 - Revision of some existing directives
 - Urban wastewater
 - Nitrate
 - Water Framework Directive
 - EQS Directive
 - QA/QC Directive
 - Groundwater Directive
 - Marine Strategy Framework Directive

Very complex landscape

Water Directives

- Since 2018: revision process
 - Drinking Water Directive (2021)
 - Water Framework Directive – on going
 - Urban Wastewater Directive – on going



The new EU rules concerning water pollutants will:

- Help **reduce or remove several substances** damaging health and the environment, such as PFAS, a range of pesticides, and antibiotics **from ground waters and surface waters**
- Tighten standards** for already regulated polluting chemicals
- Make **laws easier to understand** and to apply
- Make sure that more **up-to-date and complete information** on water status is available
- Prepare the ground for **controlling new pollutants, such as microplastics** and antimicrobial genes



Adding new substances to the lists of pollutants that need to be controlled:



✓ **PFAS**, a large group of "forever chemicals" used in cookware, clothing and furniture, fire-fighting foam and personal care products



✓ **Glyphosate**, a herbicide used in agriculture and horticulture

✓ **Pesticides**



✓ **Bisphenol A**, a plasticiser and a component of plastic packaging



✓ **Some pharmaceuticals** used as painkillers and anti-inflammatory drugs, as well as antibiotics

Drinking Water Directive 2020/2184

Objectives: to **protect human health from adverse effects of any contamination** of water intended for human consumption by ensuring that it is wholesome and clean, and to **improve access** to water intended for human consumption

Updating some quality standards

- More stringent values for chromium and lead
- Less stringent values for antimony, boron, selenium

Introduction of new parameters:

- Bisphenol A,
- Chlorite and chlorate,
- Haloacetic acides,
- micro cystine-LR,
- PFAS (total or sum),
- uranium

Tackling emerging pollutants

- endocrine disruptors
- PFAS
- microplastics

Watch list

- 1st watch list (January 2022)
- 17-beta-estradiol
- nonylphenol

Drinking Water Directive 2020/2184

- Monitoring program shall include one or a combination of:
 - Collection and analysis of discrete water samples
 - Measurements recorded by a continuous monitoring process NEW
- Specification for the analysis of parameters
 - Assessing the equivalence of alternative methods with methods laid down in Annex III, EN ISO 17994 or EN ISO 16140 may be used (microbiology)
- Operational monitoring program that provides rapid insight into operational performances of water quality problems NEW
 - Shall include the monitoring of turbidity at the water supply plant, in accordance with the reference values and frequencies (from weekly to continuously)

Proposal for Water Framework Directive

Surface waters

+ 24 individual substances to the list of priority substances
(pesticides, pharmaceuticals and industrial chemicals)

17-Beta estradiol (E2); Acetamiprid; Azithromycin; Bifenthrin; Bisphenol A; Carbamazepine; Clarithromycin; Clothianidin; Deltamethrin; Diclofenac; Erythromycin; Esfenvalerate; Estrone (E1); Ethinyl estradiol (EE2); Glyphosate; Ibuprofen; Imidacloprid; Nicosulfuron; Permethrin; Thiacloprid; Thiamethoxam; Triclosan, Silver.

+ a groupe of 24 PFAS

Changing the EQS for 16 substances : more stringent for 14

Developing a methodology for measurement and monitoring of **microplastics and antimicrobial resistance genes**

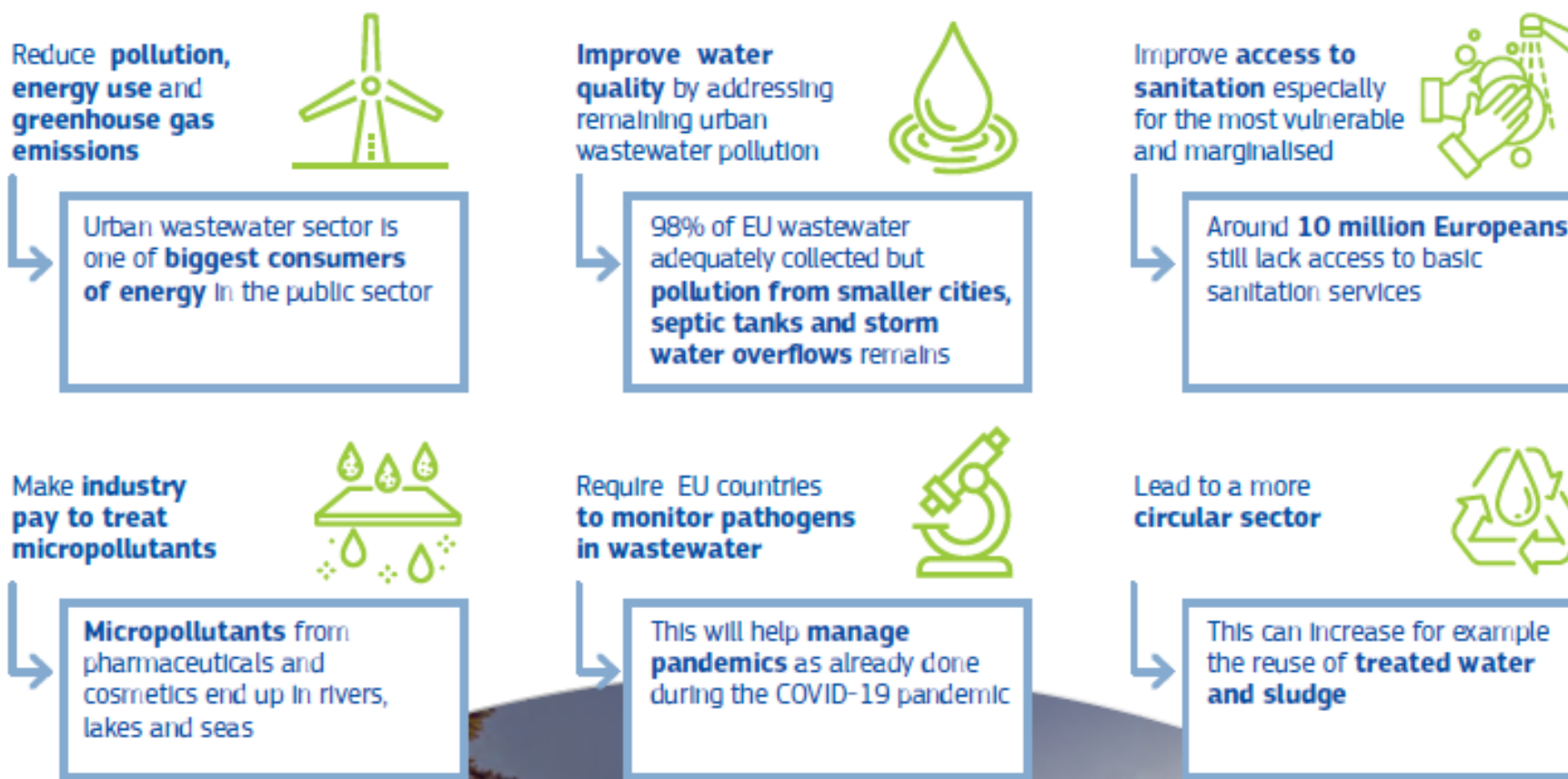
Improve existing Effect Based Method (EBM) guidelines to improve the monitoring of groups/mixtures of pollutants by using EBMs

Improve the monitoring and review cycle of the **Surface Water Watch List** so that there is more time to process the data before revising the list.

Urban Wastewater Directive

Not revised since 1991

The new EU rules on managing urban wastewater will:



Urban Wastewater Directive

➔ Reducing pollution by:



- ▶ Introducing integrated planning obligations to better handle **heavy rain**
- ▶ Enlarging the scope to cover **small cities**
- ▶ Better controlling **septic tanks**
- ▶ Introducing **stricter thresholds** for removing **nutrients**
- ▶ Introducing new additional treatment for **micropollutants**
- ▶ Introducing **health parameters** to monitor pandemics

Monitor loads of pollutants from storm water overflows and urban runoff

Lower limits and higher reduction rates for Total Phosphorus and Total Nitrogen

SARS-CoV-2 and other pathogens

Alternative methods may be used provided that it can be demonstrated that equivalent results are obtained

- Contaminant of emerging concern: pharmaceuticals and microplastics
- monitor either Chemical Oxygen Demand (COD) or Total Organic Carbon (TOC)

Microplastics in water

EU PROJECTS

- ❑ PlasticTrace / EURAMET « Green Deal Call 2021»

METROLOGY WORKING GROUPS

- ❑ **Consultative Committee for Metrology in Chemistry and Biology – CCQM / Task Group on Nano- and Microplastics Measurements and Standards :**
improving understanding, liaising with experts, and assessing metrology needs for nano/microplastics programs.



International platform for assessing scientific topics related to micro and nano plastics and supporting national and international projects in developing reliable measurement protocols for these pollutants.

Standardisation

ISO/TC 147/SC 2/JWG 1

Joint ISO/TC 147/SC 2 & ISO/TC 61/SC 14 WG: Plastics (including microplastics) in waters and related matrices

- ISO/DIS 16094-2 Water quality - Analysis of microplastic in water Part 2: Vibrational spectroscopy methods for waters with low content of suspended solids including drinking water
- ISO/CD 16094-3 Water quality y Analysis of microplastic in water Part 3: Thermo-analytical methods for waters with low content of suspended solids including drinking water

EU Standardisation needs - 2022

Ambient air quality:

- develop validated test standard(s) to evaluate the performance of **sensor-based systems** measuring air pollution
- develop standards ensuring that **modelling-based assessments** of air quality are objective, reliable and comparable
- develop standards for the **reference methods** for measuring concentrations in ambient air of **polycyclic aromatic hydrocarbons**.

Industrial emissions:

- develop European standards to ensure **sampling and analysis of relevant polluting substances** and measurements of process parameters, as well as quality assurance for automated measuring systems and the reference measurement methods to calibrate those systems.

Products and waste:

- **Sorted plastics waste and recycled plastics:** These standards should set requirements on the recyclability of plastics products, the quality of the sorted plastics waste and the quality of recycled plastics, taking into account their intended application in products after recycling
- **Digital passports for products and services:** Development of European standards addressing requirements related to trustworthiness, security, transparency of digital passports for products and services

EU Standardisation needs - 2022

Water quality:

- **Materials in contact with drinking water:** develop new European standards with regard to analytical methods for determining substances migrating from materials and methods for testing final materials in contact with drinking water
- **Wastewater treatment:** revise existing standard EN 12566: Small wastewater treatment systems for up to 50 population equivalent
- Develop / consolidate methods for **PFAS, microplastics, and antimicrobial resistance**
- In the Commission's proposal of Oct 2022 on integrated water management there is also reference to allowing monitoring by remote sensing and other innovative techniques.



- Lots of ongoing work and **interaction on air, water, industrial emissions**
- Standardisation work is key for successful implementation of zero pollution policies
- Timing and fast delivery are key – the Green Deal agenda is ambitious and the transformation cannot wait

Thank for your attention

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www.euramet.org

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