

EMN Energy Gases

“Improving reliability in the measurement of energy gases”

Chair: Annarita Baldan

Our Vision: *“To enable all countries within Europe to access the measurement tools they require to support their energy gas industries including services, products, guidance, and expertise.”*



Achievements



Energy Gases: Service Platform

The service platform below allows you to easily find information about energy gas-related services provided by the members of the EMN for Energy Gases.

The services are listed for six distinct gas types: natural gas, biogas/biomethane, hydrogen, carbon dioxide, liquified natural gas (LNG)/liquified biogas (LBG), and hydrogen/natural gas blends.

For each type of gas, services are divided into the following main categories: gas analysis, certified reference materials, flow, material testing, density, humidity and temperature, material data, training courses, interlaboratory comparison, and sampling.

Through the interactive map, you'll quickly be able to find where a given service is provided. Alternatively, search filters can be used to find your required service. To directly access the services provided by a specific EMN member, please use the table below.

Search for a service

Choose what you want to see on the map:

Gases

- CO₂ ☐
- Hydrogen ☐
- H₂NG ☐
- Biogas / Biomethane ☐
- LNG/LBG ☐
- Natural Gas ☐

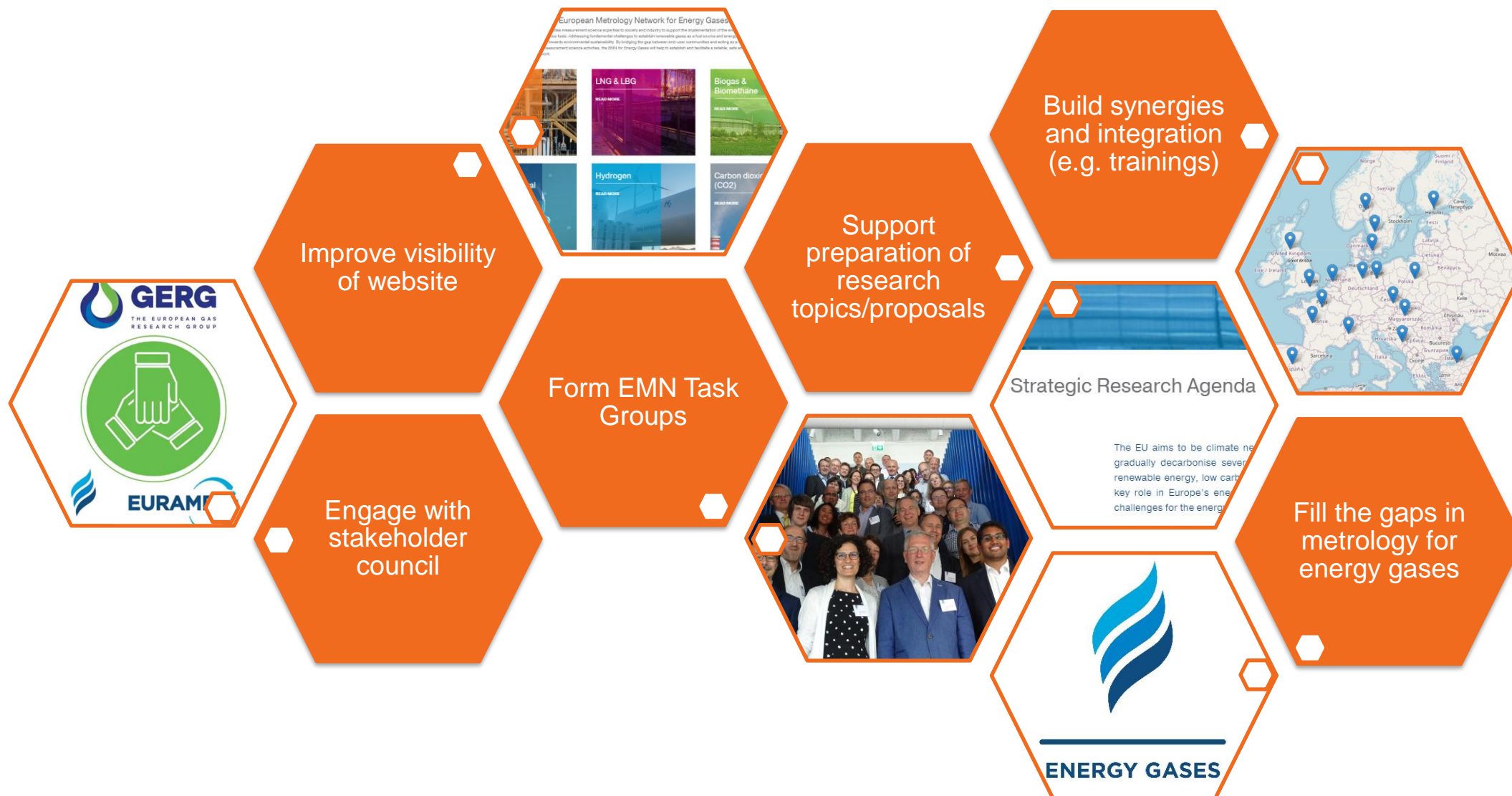
Services

- Training courses ☐
- Sampling for gas analysis ☐
- Interlaboratory comparisons ☐
- Speed of sound ☐
- Material data ☐
- Material testing ☐
- Calorimetry ☐
- Density (direct) ☐
- Flow ☐
- CRM ☐
- Gas Analysis ☐
- Humidity ☐
- Temperature ☐



ENERGY GASES

Future Actions



EMN Smart Electricity Grids

*Tackling the metrology challenges
of electricity grids to support the
energy transition*

Chair: Stefano Lodetti (NPL)

Achievements



Advocate for metrology in electricity grids sector



Excellence course

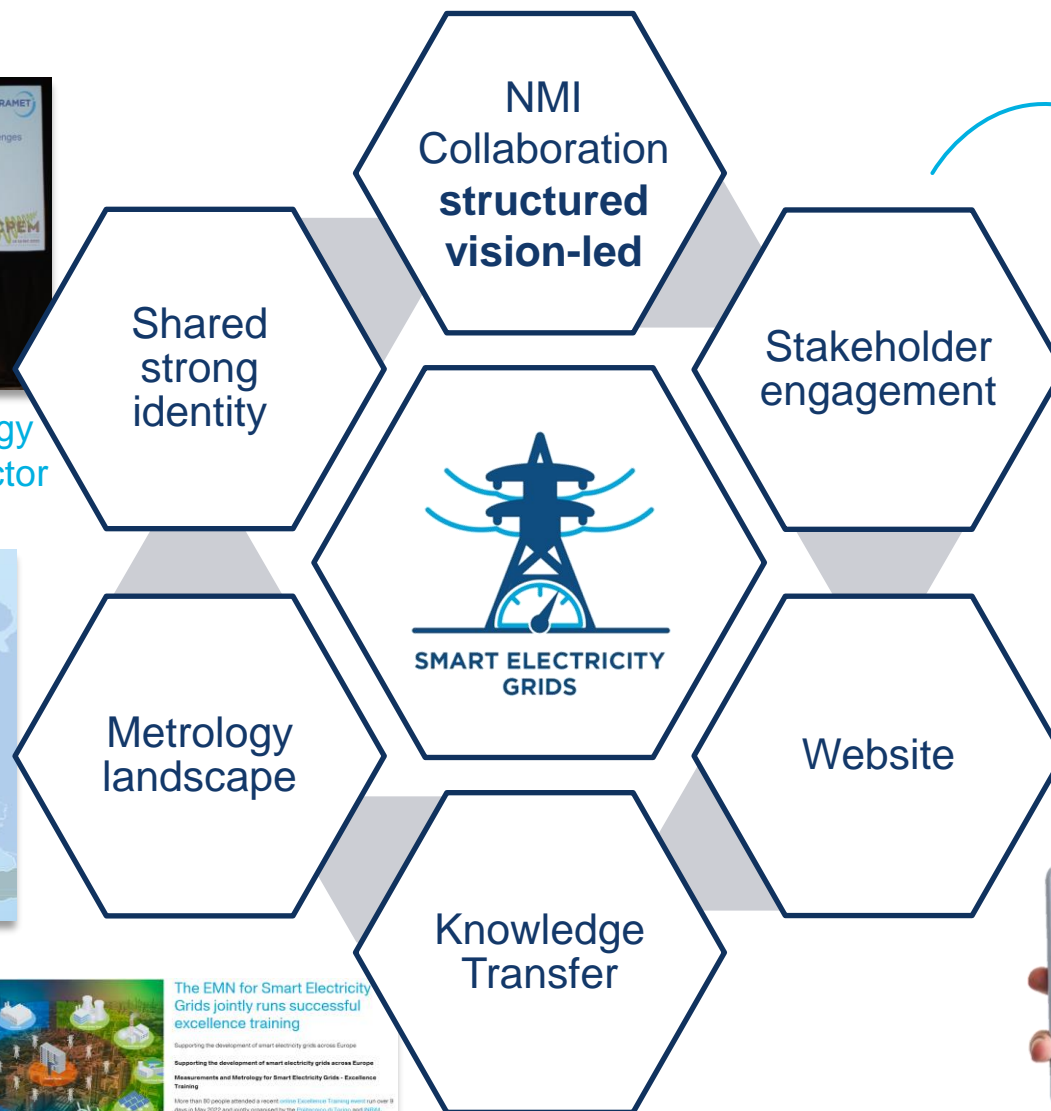
The EMN for Smart Electricity Grids jointly runs successful excellence training

Supporting the development of smart electricity grids across Europe

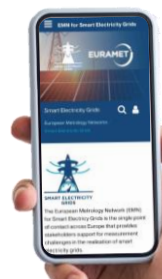
Measurements and Metrology for Smart Electricity Grids - Excellence Training

More than 80 people attended a recent online Excellence Training event on 9 March 2022 and jointly organised by the Metrology of France and Metrology of Italy's National Metrology Institute, with the support of the European Metrology Network.

The excellence course provided an extensive overview of the general measurement challenges related to smart electricity grids together with in-depth training on selected key measurement challenges, contributions to the security of electricity supplies, and considered globalisation in the context of the ongoing energy transition.

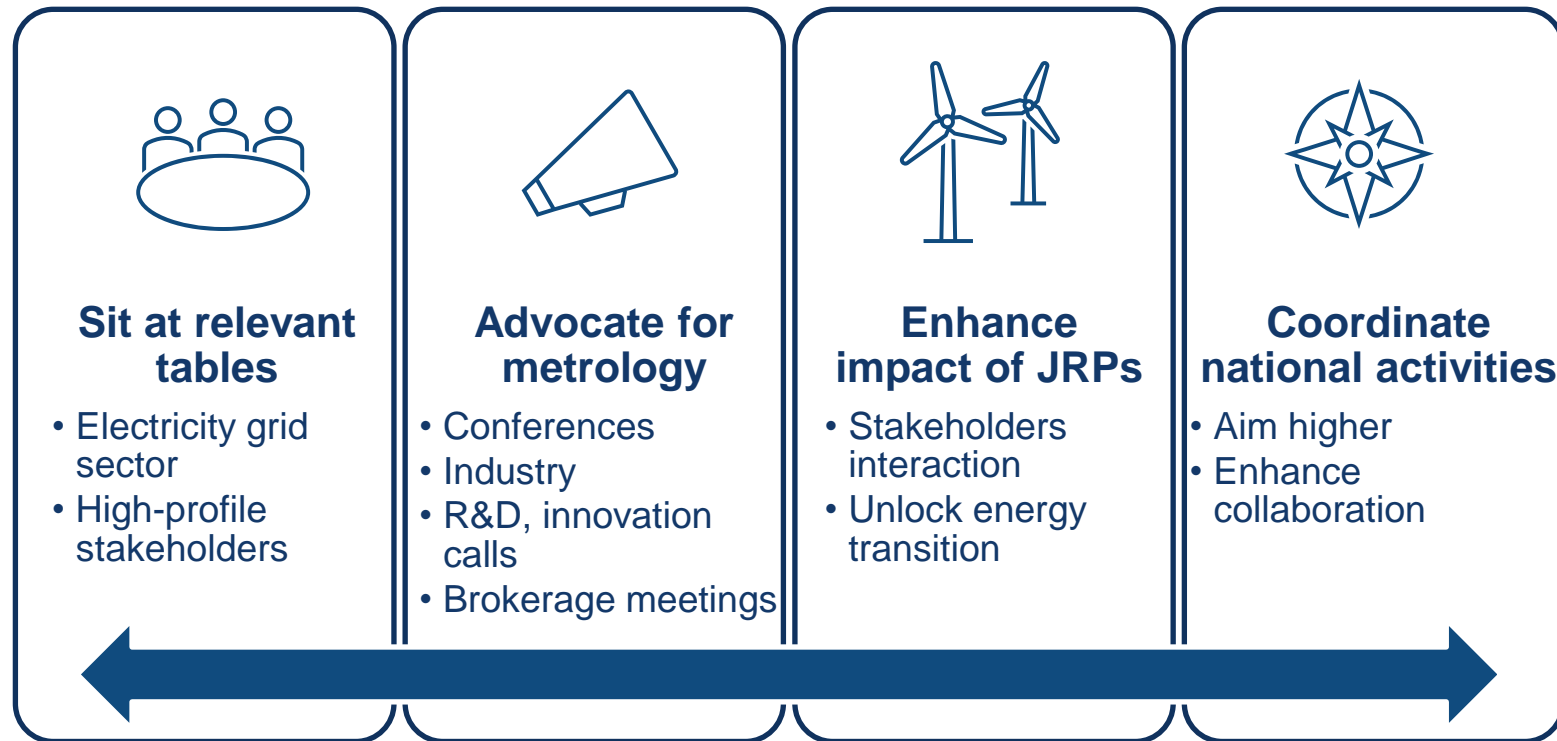


Strategic Research Agenda



Future Actions

Our aim: *“enhance stakeholder interactions, identify additional R&D support, increase coherence in R&D efforts, make next step in coordination of national activities, and maximise R&D impact”*



Make the voice of NMIs heard better in **specialised, high-level fora**

Thank you

EMN Pollution Monitoring PolMo

“Improving reliability in pollution monitoring”

Chair: Nathalie Guigues

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

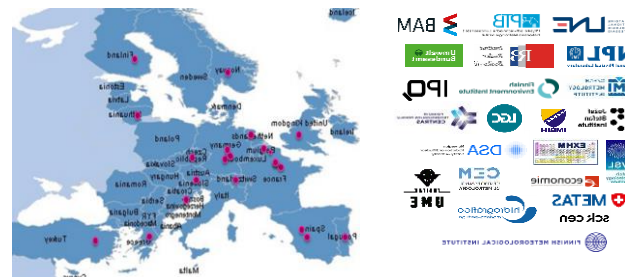
In-line with Green Deal priorities: zero pollution ambition for a toxic-free environment & biodiversity



**POLLUTION
MONITORING**

Achievements

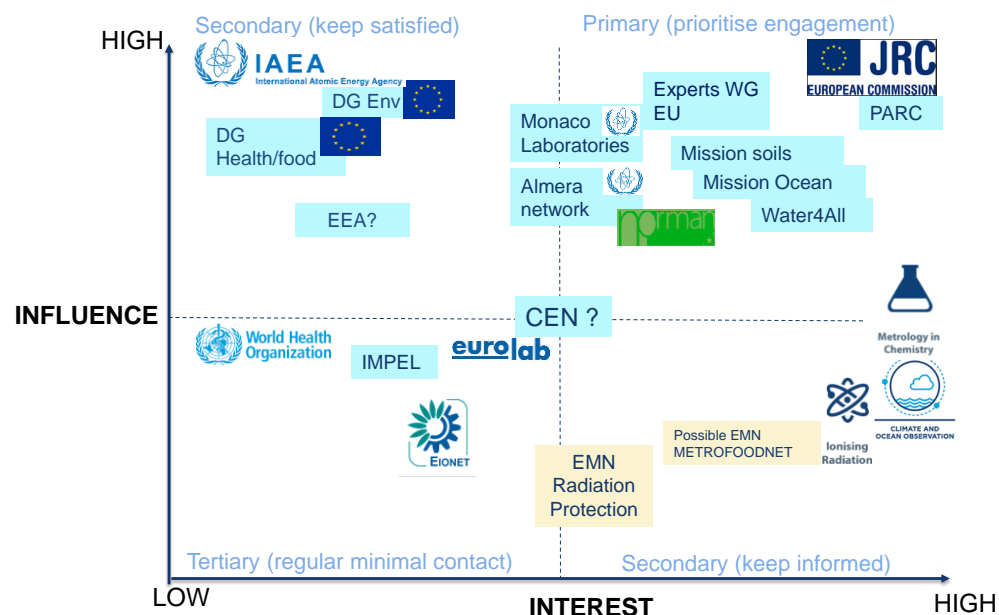
1 year old EMN → 23 members



Identification of stakeholders
Database with > 200 stakeholders

Common Stakeholder needs report

Survey launched in
March 2023



Stakeholders interaction

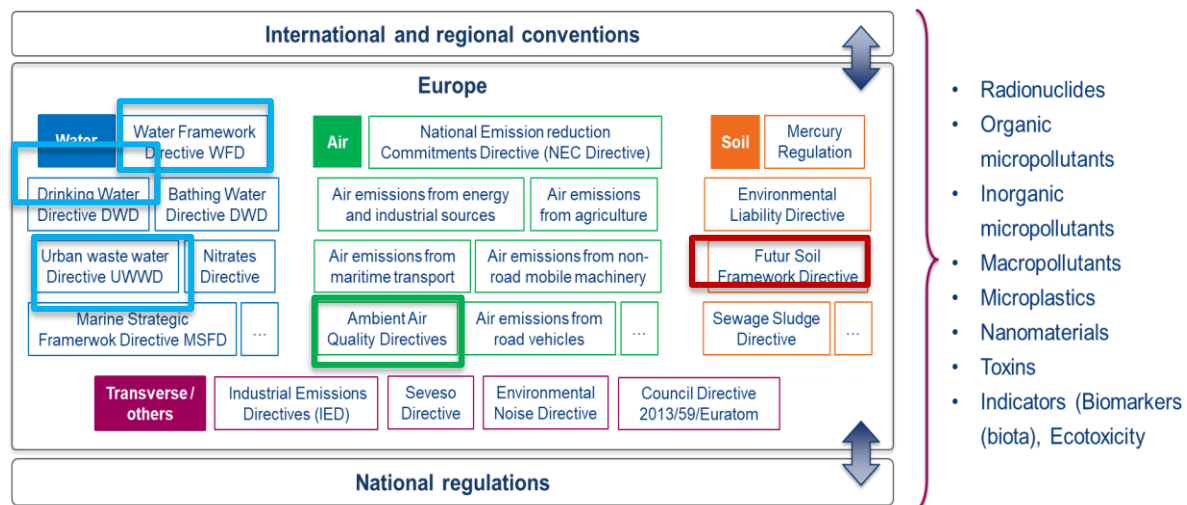
EURACHEM, EUROLAB, PARC partnership,
AQUILA, IAEA, AQUAREF, LCSQA



POLLUTION
MONITORING

Achievements

Review of existing regulations and legislations



Key Directives newly revised or under revision (Oct 2022) or under construction:

Water – DWD, WFD, UWWD

Air – AAQD

Soil - SFD

New metrological challenges identified

Review of metrological capabilities, needs and gaps

CMCs, EU and national projects in Metrology,
Technical expertise

Questionnaire to be
sent in June 2023



POLMO = Metrological reference for 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»

Common Strategic Research Agenda and roadmap

→ Efficient response of NMI/DI to stakeholder needs and regulations requirements

To be drafted end of 2023

Communication tools:
web site, newsletters,
posters & flyers

Workshops to discuss ideas
for the 2024 Green Deal
EPM call

Annual Stakeholders
Workshop



**POLLUTION
MONITORING**

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EMN for Climate and Ocean Observation

The European contribution to a global effort to bring metrology to climate and ocean observation

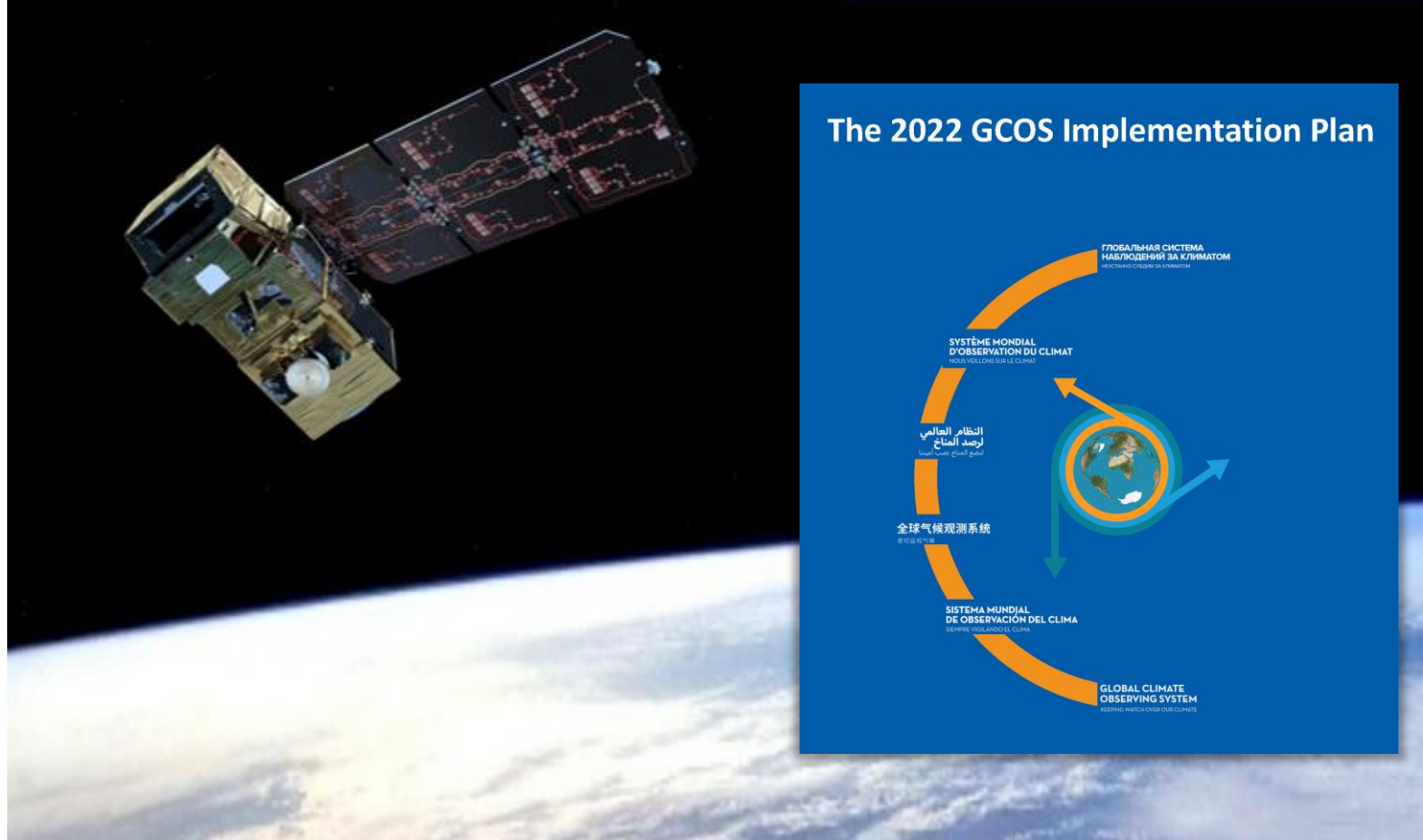
Chair: Emma Woolliams



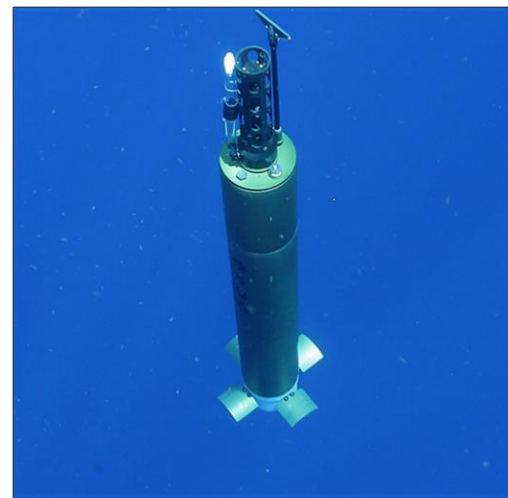
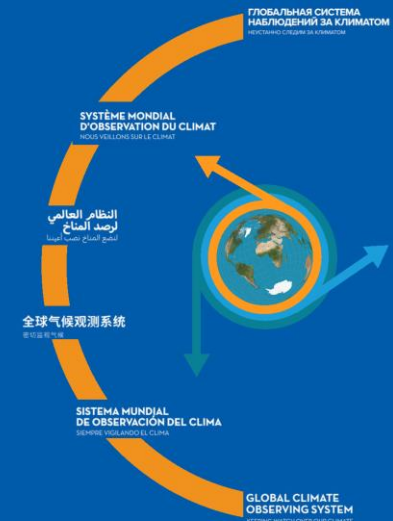
CLIMATE AND
OCEAN OBSERVATION

GCOS Essential Climate Variables (ECV)





The 2022 GCOS Implementation Plan



Achievements: Strong influence on stakeholders



- Copernicus, EUMETSAT and ESA now require NMI participation
 - Project TRUSTED approached the EMN directly for support
- WMO-GAW has designated an EMN member as a new “central calibration laboratory”
- EMN members influenced e.g. GCOS implementation plan to include a strong role for metrology, influencing terminology and methodology committees in CEOS, ISO, WMO, and linking those through the EMN
- EMN members are establishing a collaborative strategy, through project MINKE with the ocean observation community
 - EMN mentioned explicitly in GOOS implementation plan, links to OBPS
- EMN members provided metrology training online and in person to oceanography, atmospheric composition, meteorology and satellite EO community – currently being collated to share with NMIs too.
- EMN members led BIPM-WMO Metrology for Climate Action Workshop (1000 participants, 120 papers, many new to metrology community). Recommendations, being formally reviewed and endorsed by WMO, are due to be published early June.



Future Actions



BIPM-WMO
**METROLOGY FOR
CLIMATE ACTION**
26–30 SEPTEMBER 2022

Influenced



Published Strategic
Research Agenda

Recommendations to be published
early June 2023

AGM:
14/15 June

Brainstorming,
planning,
structuring with
stakeholders

Stakeholder workshops →
Project proposals

Connect existing efforts /
cross-disciplinary

Internal training / sharing
approaches

Collaborative
projects and
efforts



CLIMATE AND
OCEAN OBSERVATION

EMN Radiation Protection

“Supporting European legislation and operators with reliable data for radiation protection”

Chair: Annette Röttger

Status 2023: 16 NMI/DI & 4 Partner

Our Vision:

“Radiation protection measurements are at a new quality level in Europe and the smart specialisation ensures well-balanced expert and calibration services in radiation protection traceable to the SI.”



**RADIATION
PROTECTION**

Achievements of EMN RP



Added value:

NMI/DI: Business model for RP research and services: Process to influence the EURATOM Funding.

Member States: Trustworthy results under their duties from the Euratom Treaty and implantation of Council Directives.

EC: Anchoring European radiation protection legislation metrologically: Increased level of confidence in EU.

International Stakeholder Council:



Future Actions



Our Mission: *“To support European **legislation and operators** with reliable data including uncertainties and to clearly express where such reliable data is not available. To jointly **use national capacities to overcome the gaps** in the data. To provide quality assurance and expertise for measurements in exposure situations addressed under the European legislation. To **raise awareness** about the shortcoming in radiation protection funding of the past and to change the steering process for the future.”*

Our route to success:

Euratom Research and Training Programme – Work Programme 2023-2025:

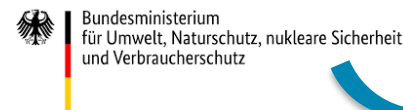
Quality assurance for measurement and for data implemented & extra Call announced.

Brokerage events:

Metrology Calls  **and Partnership Radiation Protection Calls** 

One Voice:

National funding actions / national ministries



Future Actions – Euratom



Euratom

European Atomic Energy Community

Mission to be extended?

„Quality assurance for measurements and data under Euratom“

Budget €1.38 billion (2021-2025)
distributed as follows:

-  €583 million for actions in fusion research and development
-  €266 million for actions in nuclear fission, safety and radiation protection
-  €532 million for actions undertaken by the Joint Research Centre (JRC)



**RADIATION
PROTECTION**

Thanks



Members:



Partners:



Key Stakeholders



EMN TraceLabMed

Chair: Vincent DELATOUR

Our Vision: *“Improving reliability & comparability of clinical measurements”*



TRACE LAB MED

Introduction



- Reliability of clinical measurements has a major impact on the health of European citizens : 70% of medical decisions depend on *in vitro* diagnostic devices → **need for accurate & comparable measurement results**
- Strong regulatory driver : **2017/746 regulation on in vitro diagnostic medical devices (IVDR)** :
« The traceability of values assigned to calibrators and/or control materials must be assured through available reference measurement procedures and/or available reference materials of a higher order »
- A high % of currently used laboratory tests are neither harmonized (comparable) nor standardized (SI-traceable).



Achievements :

- ✓ MoU in place, RoP under development
- ✓ **New EMN website** is live :
<https://www.euramet.org/new-laboratory-medicine>
- ✓ **stakeholder mapping** done; **communications plan** created

Future activities:

- ❖ **Identification of Stakeholder Needs** through Online Surveys
 - the survey for **IVD manufacturers** is almost finalized and will be distributed by the IFCC to all its corporate members



Implementing Sustainable services



Achievements :

- ✓ Promote the EMN as **single access point** / one stop shop for (bio)metrological services in Europe
- ✓ Thinking ongoing to establish a coordinated approach for **sharing the work** among EMN members (smart specialization)
- ✓ A first **demonstrator comparison** was organized to demonstrate the benefit of establishing results metrological traceability

Future activities:

- ❖ Establish a **service database**; Progress on **smart specialization**
- ❖ Organization of a **second demonstrator comparison** in cooperation with the ICHCLR



TRACE LAB MED

Prioritisation of measurands



Achievements:

- ✓ Inventory of **existing priority lists**
- ✓ Strong interactions established with the **ICHCLR** (International Consortium for Harmonization of Clinical Laboratory Results)
- ✓ Online **Survey** "*Metrological Traceability in EQA schemes*" distributed to all **members of EQALM** (European Association of EQA organizers in laboratory medicine) : 29 / 39 answered

Future activities:

- ❖ **Prioritise measurands** for which SI traceability is required
- ❖ Establish a roadmap of **R&D activities**



TRACE LAB MED

Further development of the EMN



Achievements:

Expanding the EMN:

- ✓ 4 reference labs became partners : RfB, INSTAND, Ref4U, WEQAS
- ✓ GUM (Poland) expressed interest in joining,
- ✓ Work in progress to establish an MoU with the JRC

Future activities:

- ❖ Expand activities beyond traditional field of clinical chemistry thinking ongoing to address genomics / molecular diagnostic



TRACE LAB MED



euramet.org/laboratory-medicine



TraceLabMed@euramet.org



TRACE LAB MED

EMN for Safe and Sustainable Food

Acting chair: Andrea M. Rossi

Our Vision: *“Promote a harmonised approach to food measurements, reference materials and standards across Europe to respond to stakeholders and regulations with confidence and quality”*

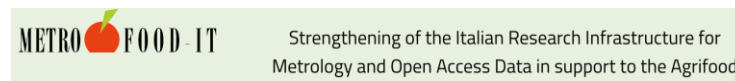
Achievements



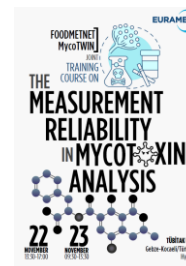
- ✓ Inventory of CMC/CRM and measurement capabilities
- ✓ Survey to collect stakeholders needs
 - inputs provided to national accreditation bodies and calibration laboratories.
- ✓ SRA draft: Creating synergies with existing initiatives and practices “clustering” involving EMN members

Projects:

- 21GRD07 PlasticTrace;
- NGEU project METROFOOD IT



- ✓ Dissemination activities: 2 publications
 - Training Course On The Measurement Reliability In Mycotoxin Analysis. 22-23 Nov 2022 more 200 participants;
 - WMD initiatives: webinar INRIM-EMN FOOD; BIPM videos; Partecipation VAMAS RMO initiative South Africa
- ✓ Participation in key and supplementary comparison
- ✓ Dialogue with METROFOOD-RI and JRC

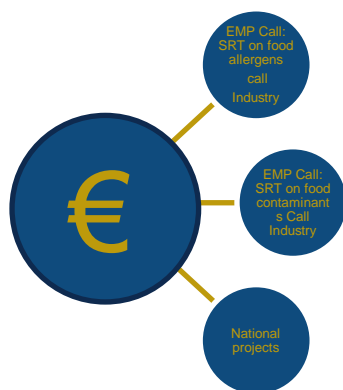


SAFE AND
SUSTAINABLE FOOD

Future Actions



- Definition of a common strategy for CRM production;
- Training course based on the outcomes of the survey;
- Exchange of researcher: PhD student for 6 months at EURL POPs;
- Increase the number of EMN members
- Take advantage of funding opportunities



European Partnership for a climate neutral, sustainable and productive Blue Economy (SBEP)

The proposed partnership will enable a just and inclusive transition to a climate-neutral, sustainable and productive blue economy through key intervention areas providing for a healthy ocean, the wellbeing of citizens, and a blue economy that is in harmony with nature and whose benefits are distributed fairly.

The SBEP targets the Green Deal and Digital Europe objectives and contributes to the Global Earth Observing System, by mobilising relevant quadruple helix stakeholders who will co-create and co-deliver knowledge-based solutions and innovative governance models, and by combining financial resources for joint transnational calls and resources for other activities.

The integration of sea-basins initiatives and strategies will ensure that impact is delivered at local, regional, national and international levels.

[Draft partnership proposal](#) ^(EN) (July 2020)

Contact

Commission services: [Wendy Bonne](#), [Eduardo Carqueijeiro](#)

Partners: Ministry of University and Research (Italy) [\[2\]](#) and Co-coordinator Research Council of Norway and 58 other partners <https://bluepartnership.eu> [\[2\]](#)



European Partnership water security for the planet (Water4All)

The objective of the initiative is to boost systemic transformations across the entire water research – innovation pipeline, fostering the matchmaking between problem owners and solution providers.

It proposes a portfolio of multi-national, multi-faceted and cross-sectoral approach, encompassing policy, environmental, economic, technological and societal considerations to enable water security for all on the long term.

By 2030, it intends to achieve reduced water stress, increased protection of water resources and ecosystems and enhanced resilience, mitigation and adaptation of water systems to global changes.

[Draft partnership proposal](#) ^(EN) (May 2020)

Contact

Commission services: [Panagiotis Balabanis](#)

Partners: Agence Nationale de la Recherche (ANR) - Olivier Bouc [\[2\]](#)



**SAFE AND
SUSTAINABLE FOOD**

EMN-Q European Metrology Network for Quantum Technologies

Ivo Pietro
DEGIOVANNI
EMN-Q Chair & INRIM

- **ETSI:** 'Industry Specification Group on Quantum Key Distribution'
- **CEN-CENELEC:**
Focus Group on Quantum Technologies (FGQT), initiated by Flagship / JRC
- **ISO/IEC:**
JTC1 'Information Technology':
 - WG14 'Quantum Computing'
 - SC 27/WG2 'Cryptography and security mechanisms'
 - SC 27/WG3 'Security evaluation, testing and specification'
 - SC 7 'Software and systems engineering' / Study Group 'Investigation of standards for quantum computing'TC 90 'Superconductivity':
 - WG14 'Superconductor electronic devices'
- **IEEE:** Several standard-developing WGs
- **IMEKO:** TC25 'Quantum measurement and information'
- **QuIC:** 'Working Group on Standardisation' (WG4)

Achievements

- **ETSI:** ‘Industry Specification Group

- **CEN-CENELEC:**

Focus Group on Quantum Techno

- **ISO/IEC:**

JTC1 ‘Information Technology’:

WG14 ‘Quantum Computing

SC 27/WG2 ‘Cryptography a

SC 27/WG3 ‘Security evalua

SC 7 ‘Software and systems
computing’

TC 90 ‘Superconductivity’:

WG14 ‘Superconductor el

- **IEEE:** Several standard-dev

- **IMEKO:** TC25 ‘Quantum m

- **QuIC:** ‘Working Group on Standardisation’ (WG4)



FGQT Q04

Standardization Roadmap on Quantum Technologies

written by the CEN-CENELEC Focus Group
on Quantum Technologies (FGQT)

Release 1 – March 2023



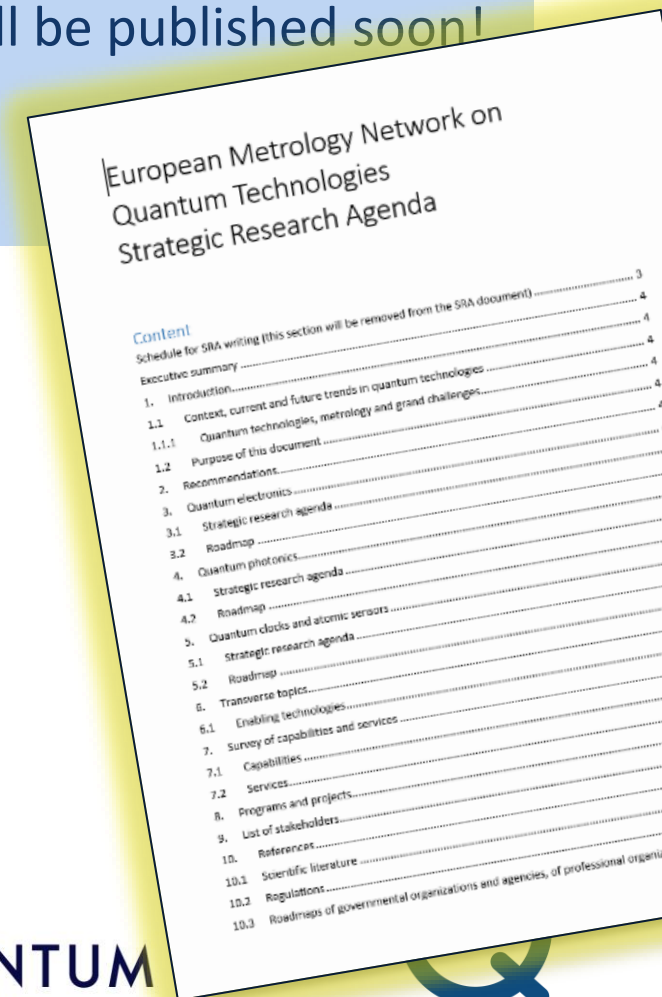
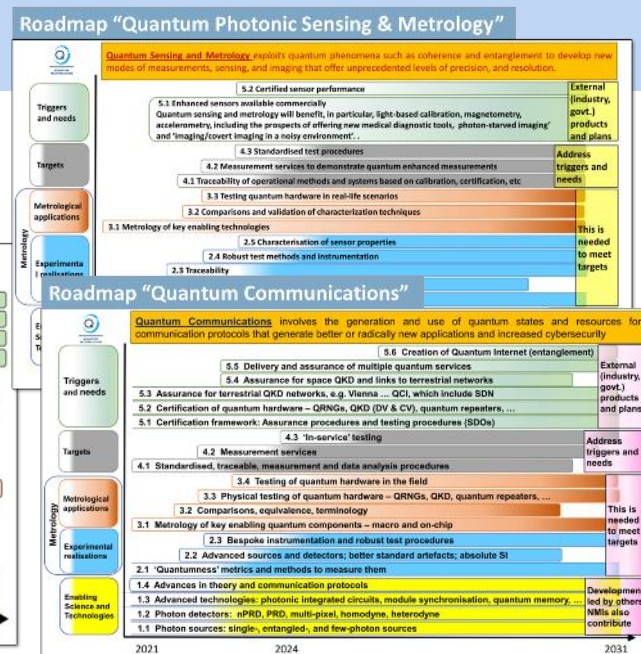
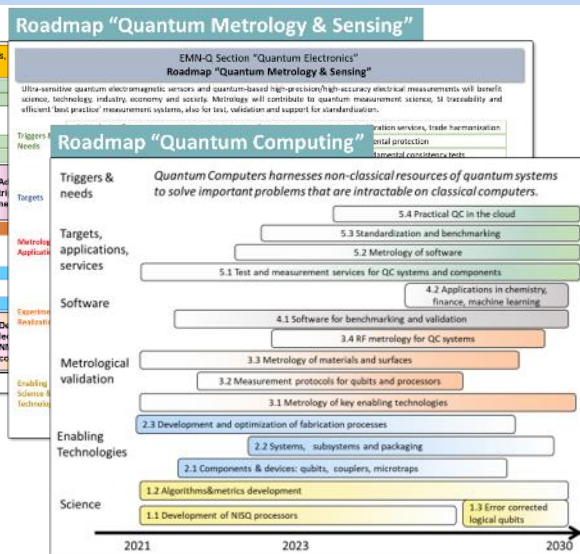
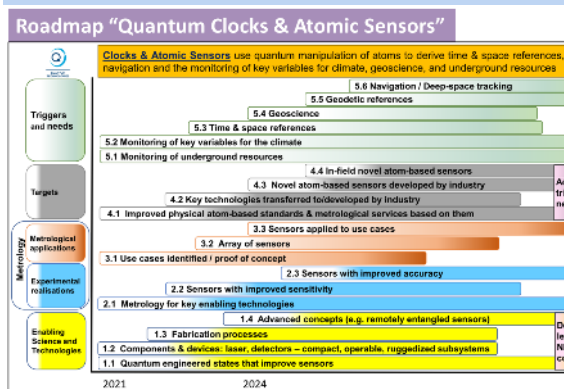
standards for quantum

Achievements

EMN-Q Strategic Research Agenda



- A Strategic Research Agenda (SRA) for EMN-Q, based on the roadmaps, will be published soon!
- Stakeholder consultation on the SRA is planned to start soon.
- The SRA will shape our work programme.



EMN-Q Capabilities and Services Portfolio

EMN-Q C&Ss Portfolio provides a coherent view of the full spread of metrological facilities and capabilities of the EMN-Q members.



**QUANTUM
FLAGSHIP**

**QUANTUM
TECHNOLOGIES**

- EMN-Q (Chair) is Member of the “Q-Flag SRA working group” (Sensing and Metrology Team)

- **NEW! Quantum Coordination Board**

EURAMET participation: EMN-Q crew!

- EMN-Q has created a link with QUIC

NEW! EMN-Q as QUIC Partner (on going)

- EMN-Q participates in FGQT CEN-CENELEC

NEW! JTC22 established.

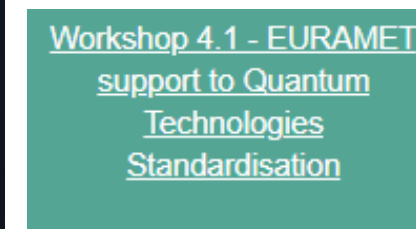
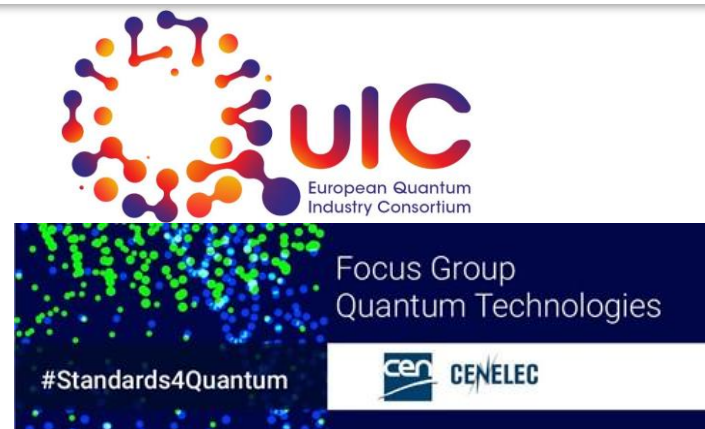
EMN-Q is the Vice-Chair (N. Spiethmann -PTB)

Q-Metro & sense convenor (J. Devaney -NPL)

WP Quantum Metrology, Sensing and Enhanced Imaging,
and Quantum Enabling Technologies

- EMN-Q is active in the Q-Flagship networking

NEW! Next EQTC announced.




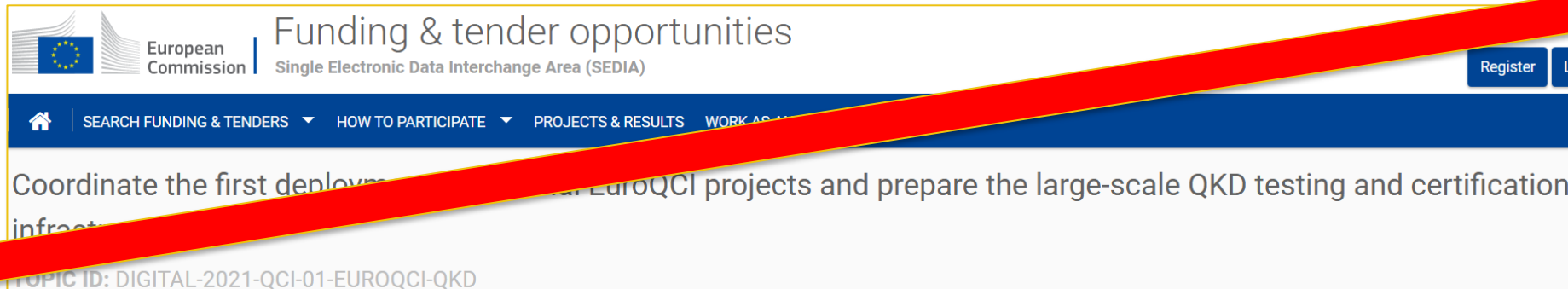
Qu-Test

Framework Partnership Agreement for open testing and experimentation for quantum technologies

Call: HORIZON-CL4-2021-DIGITAL-EMERGING-02-22
Topic: Framework Partnership Agreements for open testing and experimentation and for pilot production capabilities for quantum technologies (FPA)
Type of action: Framework Partnership Agreement
Duration of the project: 48 months

Coordinating person details:

Name		
Organisation	Nederlandse Organisatie voor Toegepast-natuurwetenschappelijk onderzoek	
Email		
Phone		




Future Actions



• Our Mission: “*To support competitiveness of the emerging European quantum industry, EMN-Q develops a European Quantum Metrology Infrastructure by coordinating, pooling, and strengthening the National Quantum Metrology Infrastructures..*”

- Concrete future actions with value to NMIs
 - Finalization of the EMN-Q in QUIC
 - EMN-Q to contribute to the Q-Flagship SRIA (Strategic Research and Industrial Agenda)
 - EMN-Q to contribute to the EQTC 2023
 - EMN-Q in collaboration with EURAMET to propose the *European Quantum Measurement and Testing Infrastructure (EuroQMTI)*



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EMN for Advanced Manufacturing “Empowering key enabling technology through metrology”

Chair: Harald Bosse

Our Vision: “To provide European Advanced Manufacturing industries with dedicated metrology solutions supporting the transition processes to a competitive, digitalized and green production.”



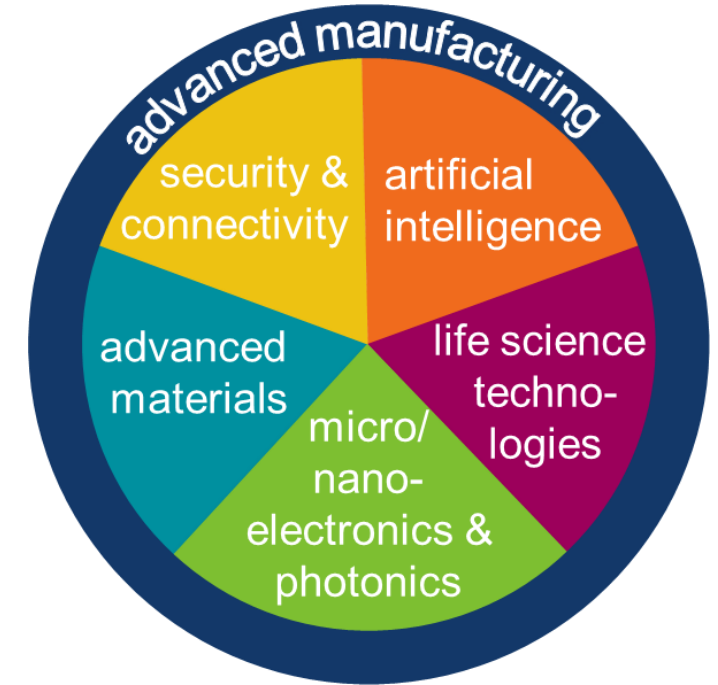
ADVANCED
MANUFACTURING

Achievements



Addresses metrology issues in **Key Enabling Technologies (KETs)** “Advanced Manufacturing” and “Advanced Materials”

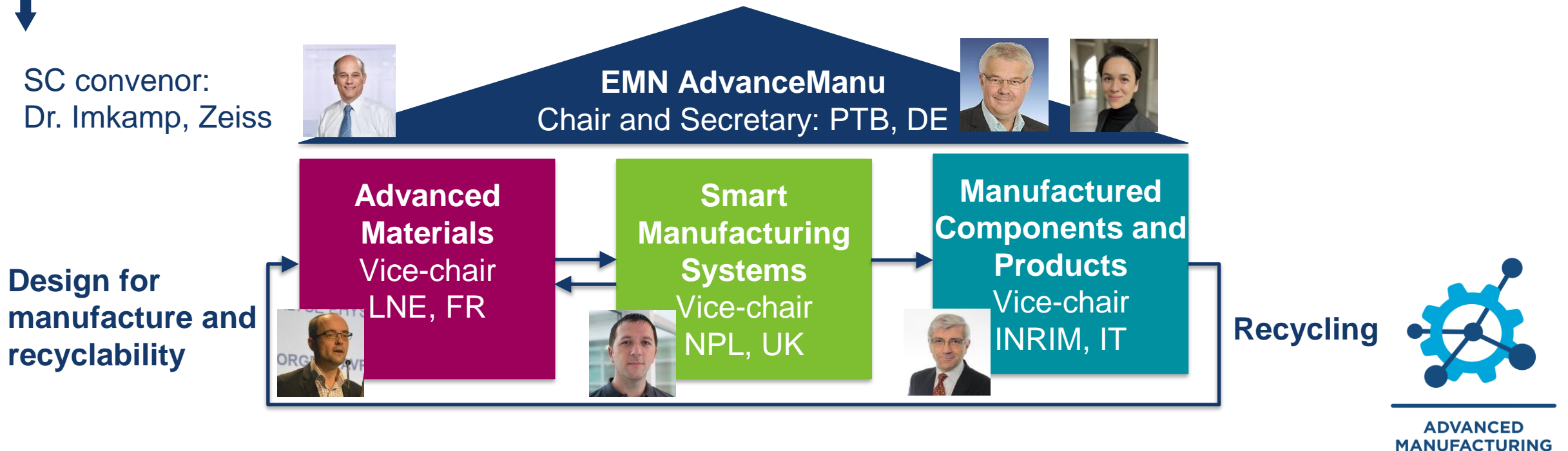
- **Strategic liaisons** established with **partnerships** Made in Europe, KDT (Chips JU) and Advanced Material Initiative 2030
- **Formal liaisons (MoUs)** with VAMAS and euspen established
- Several **Stakeholder workshops** organised
- **Stakeholder council** established representing **13 Key Industry Sectors (KISSs)** with strong metrology needs
- Development of Strategic Research Agenda (**SRA**) and foster joint projects
- **EMN** enabled participation in **AI-MATTERS** project (HE AI TEF)
- **Capacity Building** workshop held to evaluate situation in Advanced Manufacturing in **EU-13 and candidate countries**



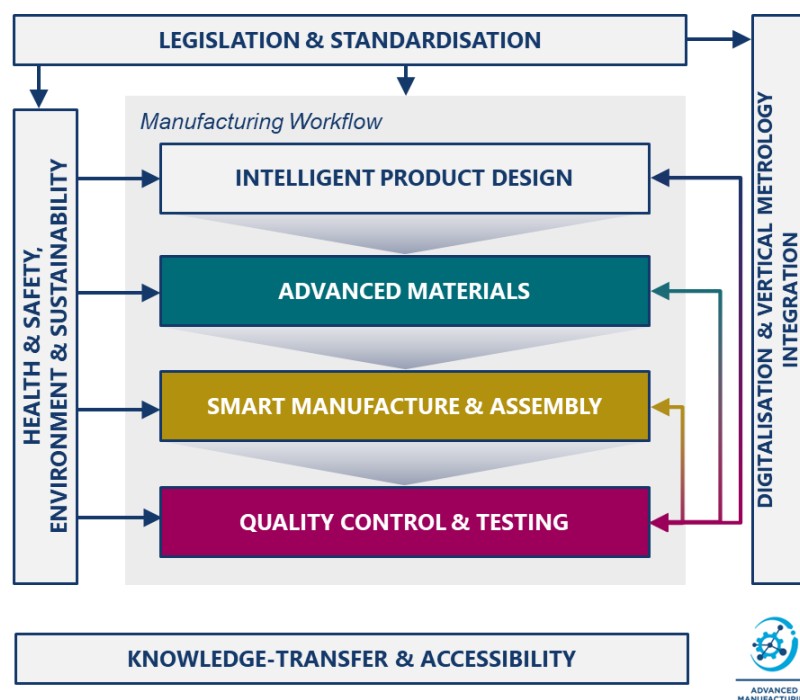
Achievements



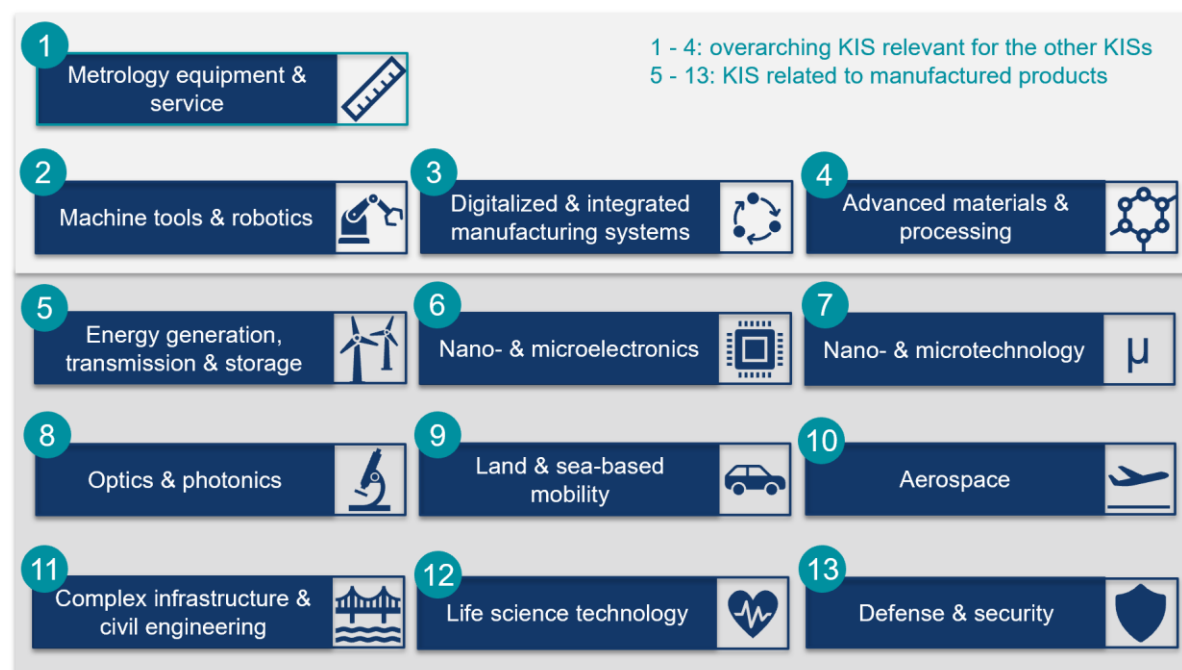
- [EMN for Advanced Manufacturing](#) established in **Sep. 2021** (members: 18 NMIs/DIs)
- **Stakeholder Council (SC):**
Zeiss, Renishaw, Siemens, Vestas, STMicroelectr., DTU, CERN, BfR, BASF, Rolls-Royce, ...
- EMN organized in **3 Sections:**



Identification of **Cross Cutting Topics (CCT)** and 13 **Key Industry Sectors (KIS)** with strong metrology needs, addressed in the SRA



CCT: Cross Cutting Topics



KIS: Key Industry Sectors



Future Actions



Our Mission: *“To sustainably provide an effective European Metrology Network comprising experts in the field of measurement science to drive forward innovation and to support the European Advanced Manufacturing industries in the transition to a competitive, digitalized and green production.”*

- Finalize draft SRA by August 2023 and effort to publish SRA and SA by end of 2023
- Align with partnership KDT/Chips JU to properly address metrology issues in support of European semiconductor manufacturing in the workplans of Chips EU
- Align with planned partnership AMI 2030 to properly address metrology issues related to advanced materials in AMI 2030 Strategic Agenda

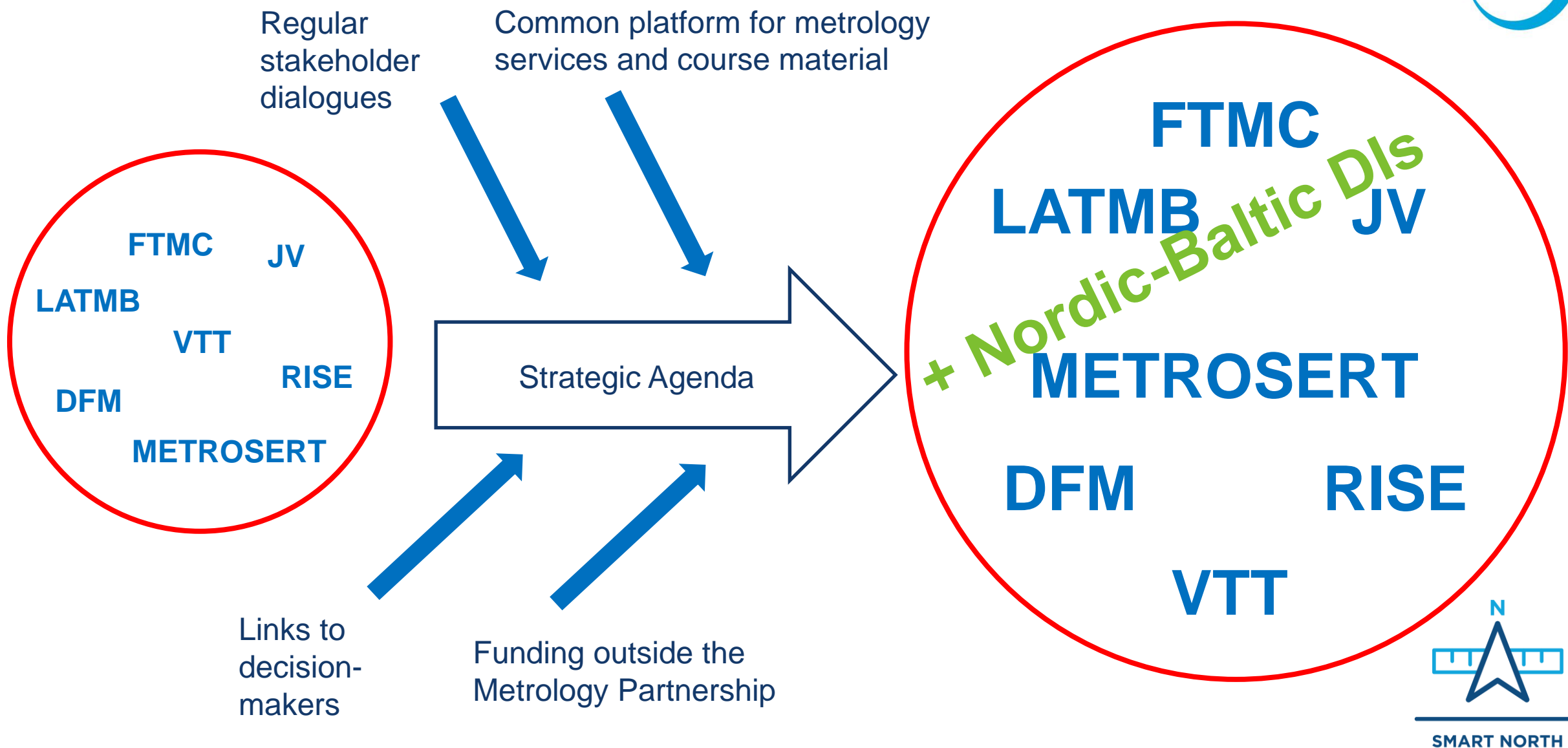


EMN Smart North – the smallest and slowest of all

Vision:

“The European Metrology Network Smart North strives at a sustainable development of high level metrology services for industry in Nordic and Baltic countries”

Achievements and way forward





Our mission

To underpin and strengthen the competitiveness of industry in Nordic-Baltic countries by providing high level metrology infrastructure and services.

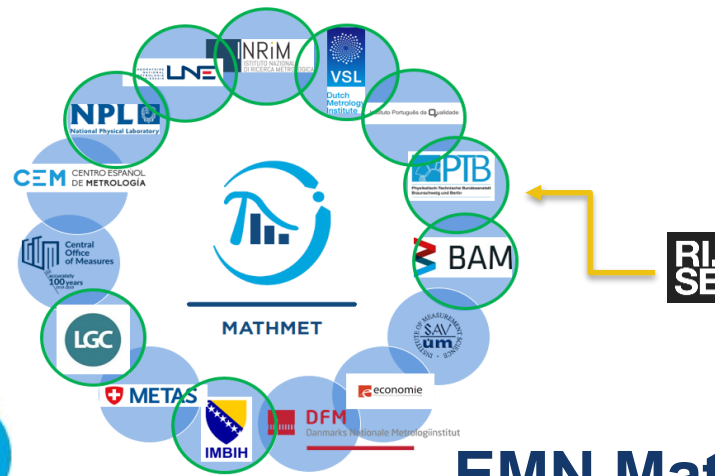
Future Actions



Three targets were chosen to drive most important developments to improve current NMI level services to customers, advance sustainable finance by widening funding scheme and develop capabilities for the future needs of our stakeholders.

	Target	Identified gaps
1	Easy access to NMI level services in the region that are not available at the NMI originally contacted	Common approach (platform) for directing customer enquiries to another NMI that can provide the requested service
2	Increase funding from EU and other funding sources	Coordinated project preparations to project calls outside the Metrology Partnership
3	Dynamic measurement capabilities: 1st priority metrology services in the region in a coordinated manner	Calibration capabilities are to be developed





EMN Mathmet

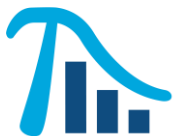
“Supporting mathematical and statistical applications for measurement science in Europe”

Chair: Francesca Pennechi (INRiM)

Our Vision: *EMN Mathmet ensures quality and trust in algorithms, software tools and data for metrology, and in inferences made from such data, to foster the digital transformation*

mathmet@euramet.org

<https://www.euramet.org/european-metrology-networks/mathmet>



MATHMET

Achievements

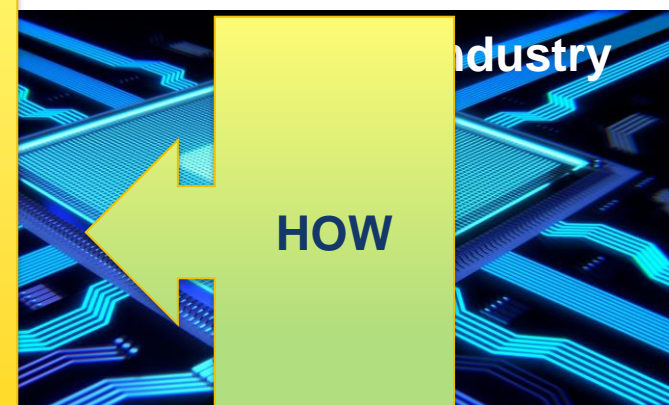


Backbone EMN – crosscutting

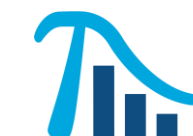
of applications



WHAT



HOW



MATHMET

Achievements

WHAT

HOW



National strategies
PRTs & JRPs
CIPM Strategy 2030+

Quality-assured SW, datasets and guidelines
NMI/DI QMS teams; Usage by JRPs
Facilitation of commercial collaborations

Strategic Research Agenda (draft SRA)

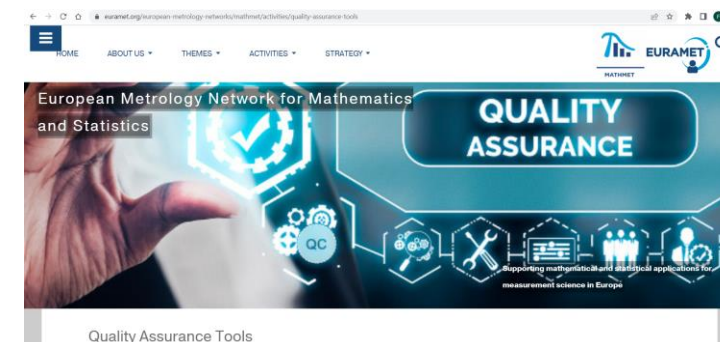


Software

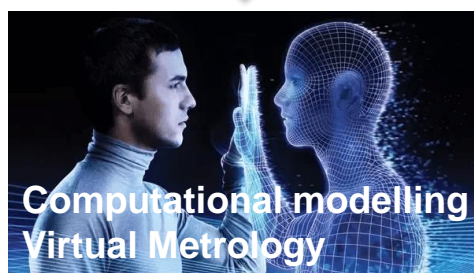
Data

Guidelines

Quality Assurance Tools (draft QAT)



Data analysis &
uncertainty evaluation



Computational modelling
Virtual Metrology

Achievements



SUPPORT

Measurement Uncertainty (MU) Training Activity (unfunded activity)



*Material exchange; mutual attendance
NMI/DI courses advertised
30 training courses improved*

MU
Trainees

MU
Teachers

QAT end-
users

Training and webinars on QAT & SW quality

*Emerging NMIs assisted
Wide audience reached out*



18NET05 MATHMET
Support for a European Metrology Network
and statistics

Agenda

Training course on measurement uncertainty
for the Western Balkan Co
Sarajevo, Bosnia and Herz
6, 7 July 2022

Speaker: Keith Lines, Data Science Department, National Institute of Standards and Technology
Date: 18th October 2022, at 12:00-13:00 CEST



European Network for Business
and Industrial Statistics



Mathmet training course on Quality Assurance Tools

Date: 2023-03-22 to 2023-03-23 Location: Online event Share the Event



Future Actions



Our Mission: “To provide a sustainable structure in Mathematics and Statistics for metrology to strengthen the European measurement infrastructure in facing the grand challenges (digital transformation, climate change mitigation, health and environment safety, energy and society sustainability).”

