

European Metrology Networks: Concept on Radiation Protection, IR Protect

Measurement for Health, World Metrology Day 2021

This project 19NET03 supportBSS has received funding from the EMPIR programme co-financed by the Participating States and from the European Union's Horizon 2020 research and innovation programme.

19NET03 supportBSS denotes the EMPIR project reference.





Metrology: To measure is to know!

But without knowing: What, where and how do we measure in radiation protection?



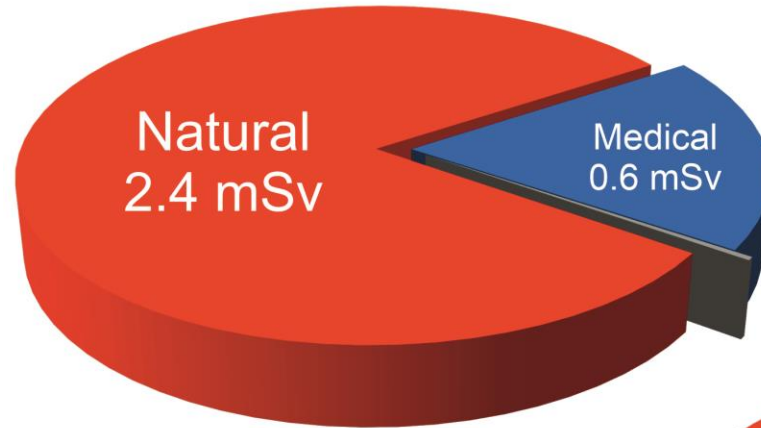
Why is the radiation exposure increasing worldwide?

Advances in medical therapy, nuclear industry and other technical development generate **new exposure scenarios** and **increasing radiation exposure** for a growing number of workers.

<https://www.iaea.org/topics/workers>

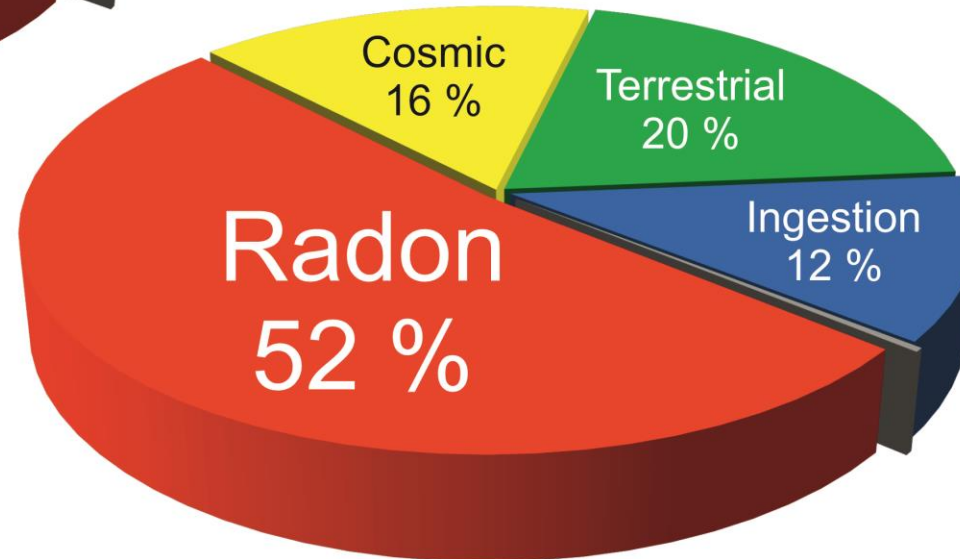
Due to **increasing urbanization** followed by the **change of living conditions**, the influence of natural radioactivity from radon and natural occurring radioactive material in buildings increase the exposure of all people.

<https://www.iaea.org/.../prevention-and-mitigation-methods-related-to-indoor-radon-and-natural-radionuclides-in-building-materials>



Total average individual dose: 3 mSv/a

Safe application of ionizing radiation:
New medical and technological achievements



Public exposure to natural radiation
UNSCEAR, 2008

Improvement of living conditions: Protection of health and environment



EURAMET'S EUROPEAN METROLOGY NETWORKS

Close collaboration in measurement science with a new sustainable structure

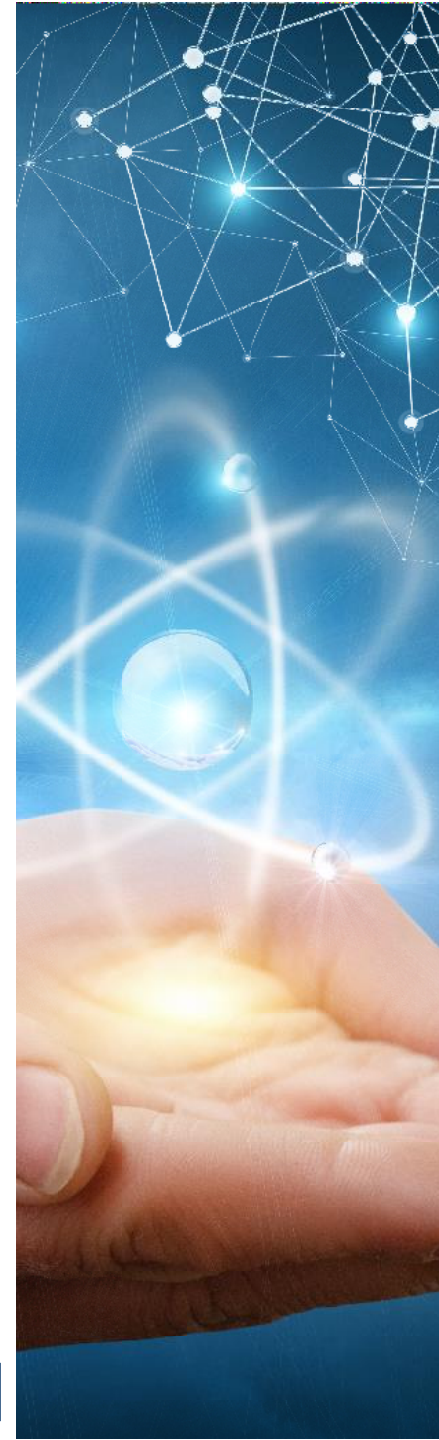
The vision of EURAMET and its members is to ensure Europe has a world-leading metrology capability, based on high-quality scientific research and an effective and inclusive infrastructure, that meets the rapidly advancing needs of end users. EURAMET's European Metrology Networks (EMNs) help realising this aim.

Currently there are six EMNs: [Mathematics and Statistics](#), [Laboratory Medicine](#), [Quantum Technologies](#), [Smart Electricity Grids](#), [Energy Gases](#), and [Climate and Ocean Observation](#).

[and radiation protection!](#)

The EMNs will analyse the European and global metrology needs and address these needs in a coordinated manner. EMN members will then formulate common metrology strategies including aspects such as research, infrastructure, knowledge transfer and services. The members will be committed to contributing to the EMN, helping to establish sustainable structures that are strategically planned from the outset.

By providing a single point of contact for information, underpinning regulation and standardisation, promoting best practice and establishing a comprehensive, longer-term infrastructure, the EMNs aim to create and disseminate knowledge, gain international leadership and recognition, and build collaboration across the measurement science community.

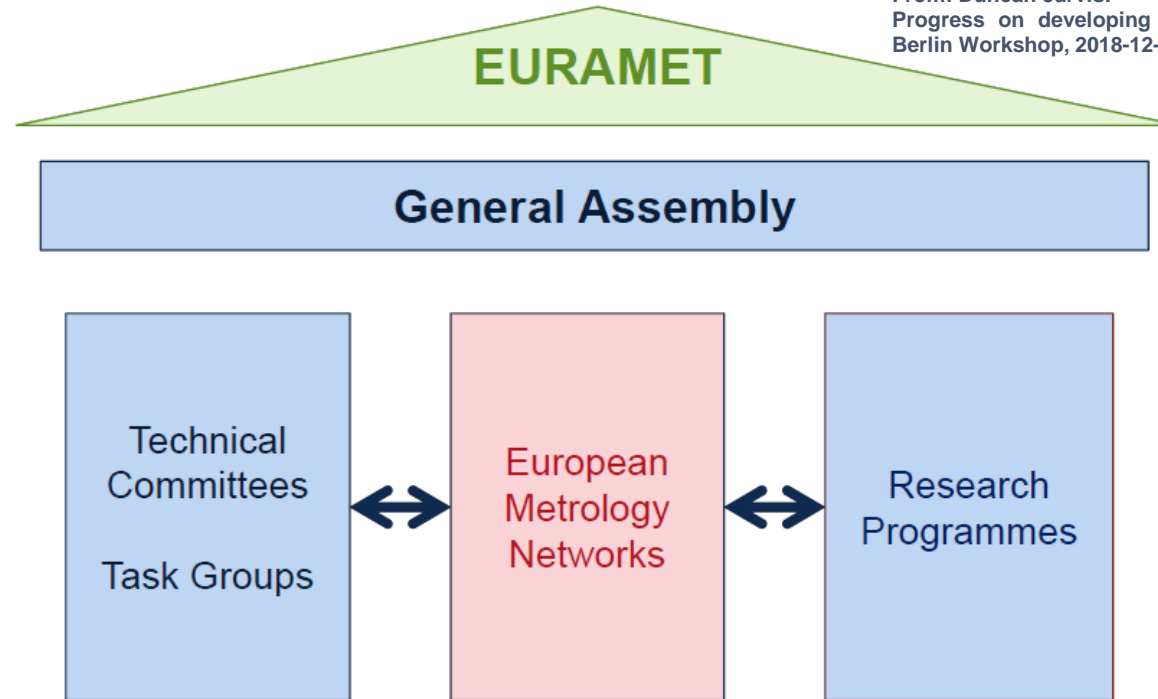


Submission of the proposal of IR Protect (February 2021 and March 2021)

Accepted for the GA EURAMET (June 2021) – Will we be approved?



From: Duncan Jarvis:
Progress on developing EMNs,
Berlin Workshop, 2018-12-14



New structural element
described in EURAMET Rules of Procedure (RoP)



Kick-off Meeting EMPIR 19NET03 supportBSS

Towards a proposal for an EMN on Radiation Protection

23 June 2020 EMPIR 19NET03 supportBSS

08:00 - 08:30 Technical test of the Web Conference

08:30 - 09:00 **Registration**
09:00 - 09:15 **Welcome**
09:15 - 09:45 **Keynote talk:** Ellie Connolly (JNP Project Officer), *Introduction to JNPs*
09:45 - 10:00 **Open Questions**
10:00 - 11:00 **Initial Activities:** JNP Work Packages 1 & 2
11:00 - 11:15 **Break**
11:15 - 12:15 **Initial Activities:** JNP Work Packages 3 & 4
12:15 - 13:15 **Lunch**
13:15 - 14:15 **Initial Activities:** JNP Work Packages 5 & 6
14:15 - 15:30 **First outputs:**
Publishable summary
Data Management Plan
Open Discussion:
Stakeholder Committee, Logo, Newsletter and the next meeting
Closing Remarks

15:30 - 16:00



The meeting will be held at PTB Braunschweig in combination with a web conference.

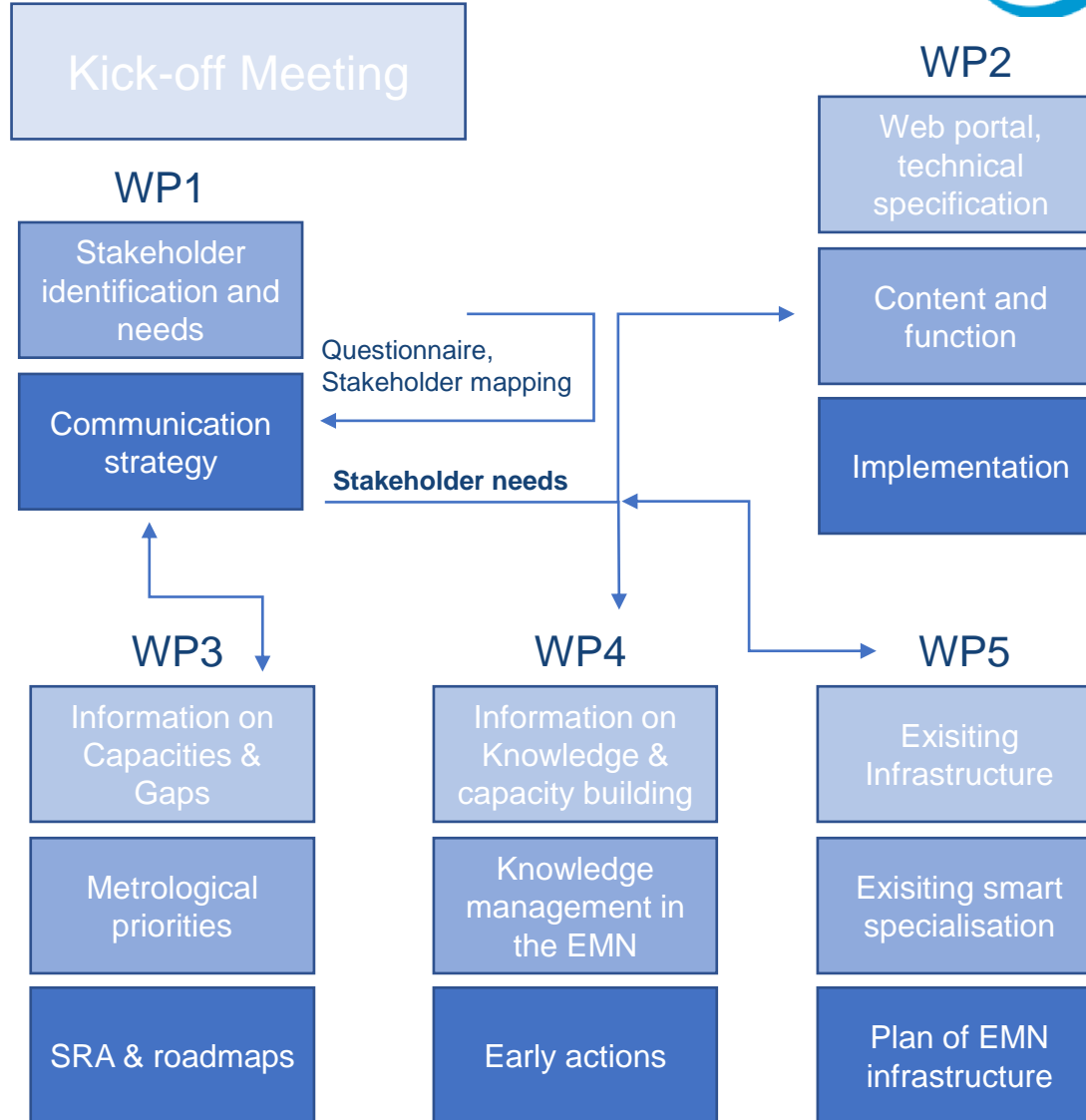
24 June 2020 EMN based on 19NET03

08:00 - 08:30 Technical test of the Web Conference

08:30 - 08:45 **Registration**
08:45 - 09:00 **Welcome**
09:00 - 09:15 **Summary of Day one:** 19NET03 supportBSS
09:15 - 09:45 **Keynote Talk:** Jörn Stenger (EURAMET chair elect), *The strategic role of the EMNs*
09:45 - 10:30 **Keynote Talk:** Thomas Damitz (EURAMET Networks Officer), *Experience from existing EMNs*
10:30 - 10:45 **Break**
10:45 - 11:15 **Keynote Talk:** Annette Röttger (PTB), *Our route to the EMN for radiation protection*
11:15 - 12:15 **Open Discussion**
12:15 - 12:30 **Closing Remarks**

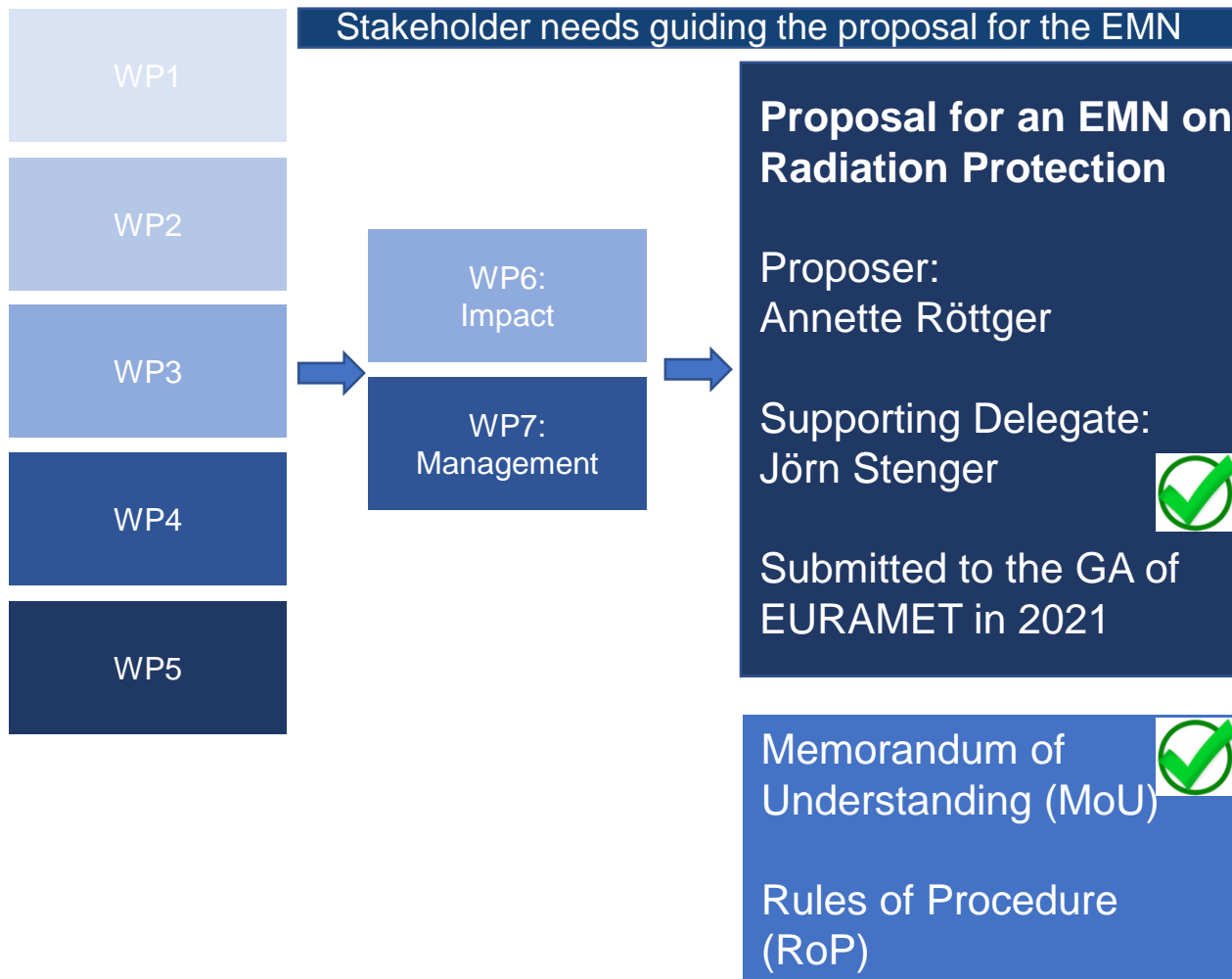
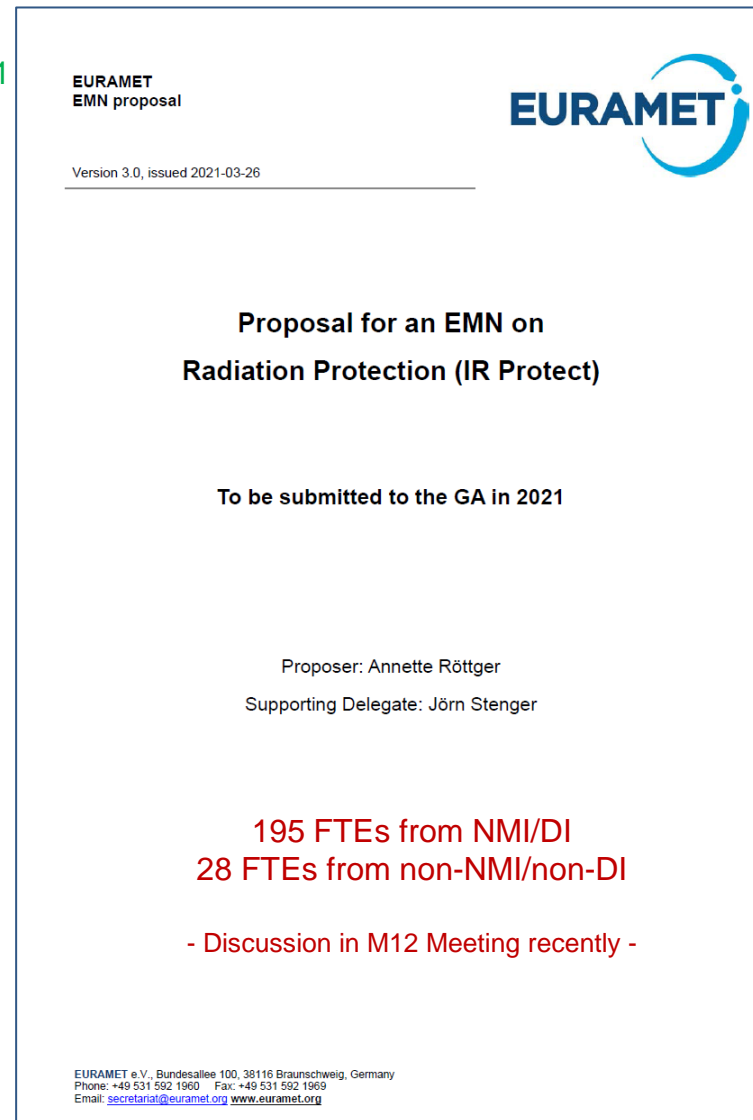
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EURAMET e.V., Bundesallee 100, 38116 Braunschweig, Germany
Phone: +49 531 592 1960 Email: secretariat@euramet.org www.euramet.org



Impact of the EMN

Draft submitted to EURAMET
5th February 2021 & 26th March 2021

EURAMET
EMN proposal

Version 3.0, issued 2021-03-26

Proposal for an EMN on Radiation Protection (IR Protect)

To be submitted to the GA in 2021

Proposer: Annette Röttger
Supporting Delegate: Jörn Stenger

195 FTEs from NMI/DI
28 FTEs from non-NMI/non-DI

- Discussion in M12 Meeting recently -

EURAMET e.V., Bundesallee 100, 38116 Braunschweig, Germany
Phone: +49 531 592 1960 Fax: +49 531 592 1969
Email: secretariat@euramet.org www.euramet.org



Making a vision reality

https://www.euramet.org/index.php?eID=tx_securedownloads&p=418&u=0&g=0&t=1651646867&hash=01764acae6928e87ab18f9209b639aa1a35ee0bf&file=Media/images/projects_EMRP_EMPIR_Partnership/Networks/19NET03/supportBSS_Project_Overview_2021_03_15.pdf



supportBSS Project Overview March 2021

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EURAMET's European Metrology Networks

The vision of EURAMET and its members is to ensure Europe has a world-leading metrology capability, based on high-quality scientific research and an effective and inclusive infrastructure, that meets the rapidly advancing needs of end users. [EURAMET's European Metrology Networks](#) (EMNs) will help to realise this aim.



member states to build and maintain sustainable metrological competence. Increased digitalisation will lead to digital legal dosimetry over the next few years. Legal dose assessment and an associated dose registry is currently a national issue, but exposed workers are active internationally, therefore their personal dose values must be combined into a single value. This is only possible if dose assessment is performed in each country with the same level of reliability and that combining dose values is done based on harmonised data processing.

In the past, radiation protection regulations were often implemented without considering the metrological implications, leading to cost inefficiencies. In addition, implementation of limit values was hard to comply with in practice. Shared specialist facilities would allow the required protection to be achieved without driving up costs.

At the moment 16 project partners are working on this goal!



History of radiation protection

Radiation protection legislation has been overhauled to better protect European citizens. Radiation protection measurement (dosimetry) will need to become more responsive to changing needs, by supporting new technologies more harmonised worker protection measures, and digitalisation trends. As there is no comprehensive facility capable of supporting all these requirements, a European Metrology Network for reliable radiation protection regulation is being considered, to help introduce a legally enforceable European quality assurance system. The project to support the establishment of the EMN started in June 2020 and will last for four years. It aims to develop a long-term ongoing dialogue between the metrology community and relevant stakeholders in the field of radiation protection regulation.

The need for this development in quality assessment capabilities to enable comprehensive radiation protection can be understood best by looking back to the history of radiation protection. This history begins at the turn of the 19th and 20th centuries with the observation that ionising radiation from natural and artificial sources can have a damaging effect on living organisms.

The discovery of X-rays by Wilhelm Conrad Röntgen in 1895 led to extensive experiments by scientists, physicians and inventors. Initially, the experiments were handled very carelessly. For a long time, the dangers of radioactivity and radiation were not recognised, see [Figure 2](#).

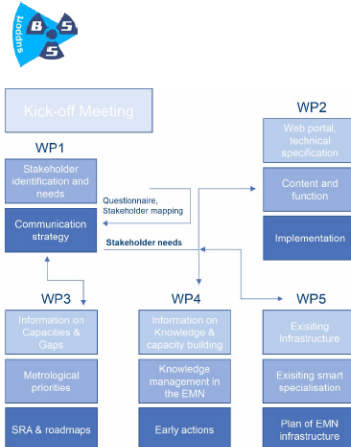


Figure 3: The objectives of supportBSS: Our route to an EMN. (WP = work package)

Objective 1: Implementing a long-term dialogue

The aim is to establish regular, constructive dialogue and liaison between the project and stakeholders of radiation protection regulation. The stakeholder needs are central to the development of all objectives, see [Figure 3](#).

An on-line questionnaire to identify existing metrological capabilities related to radiation protection, stakeholders and their needs was created and sent to the identified list of stakeholders. The stakeholders included standards development and regulatory organisations, national and international bodies, manufacturers of radiation protection devices, medical staff, etc. A stakeholder committee was formed as a result of discussions during and after kick-off meeting with the consortium and stakeholder groups. Also, the available information on SRAs and roadmaps has been collected and summarised for the stakeholders. The stakeholder database has been created and will be updated regularly throughout the project.

Objective 2: Web portal for radiation protection regulation

The aim is - to design and implement a web portal serving as a contact point for the metrology community, stakeholders and customers in the area of radiation protection. The web portal will enable stakeholders' easy access to capabilities and the ability to interact and exchange information.

The majority of work planned for this objective is in 2021. This will rely on the stakeholder database and on the information gathered from them. Currently, an



Objective 5: Joint and sustainable European metrology infrastructure

The aim is to develop a plan for a joint and sustainable European metrology infrastructure underpinning radiation protection regulation. The plan will be completed within the first 12 months of the project and will address how to (i) use coordination and smart specialisation of capabilities (ii) align with other running initiatives and projects, (iii) promote the development of emerging member states, and (iv) consider how to extend collaboration to third countries.

To date, the existing metrology infrastructure that underpins the radiation protection regulation has been identified and combined into a database. The available good practice guides and international standards (ISO, IEC) and IAEA guides related to radiation protection calibrations, type testing and emergency preparedness have been collected as well and have been combined in a second database. Using this data, a gap analysis will be performed to identify the fields of radiation protection where infrastructure, guides and standards are missing.

Past Events

Kick-off meeting of supportBSS

Kick-off Meeting
EMPIR 19NET03 supportBSS
Towards a proposal for an EMN on Radiation Protection

23 June 2020 EMPIR 19NET03 supportBSS	
08:00 - 08:30	Technical level of the Web Conference
08:30 - 09:00	Registration
09:00 - 09:15	Welcome
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Figure 4: Agenda from supportBSS kick-off meeting.

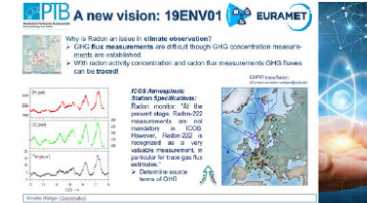


Figure 5: The environmental aspects play an important role in the developing EMN on radiation protection.

In the annual meeting of EURADOS e.V., the consortium presented first results in the WG 3.3 with a special focus on the environmental aspects following the EMPIR environmental call in 2019 and preparing for the Green Deal call in 2021 of the potential European Partnership on Metrology.

EURAMET Stakeholder Engagement Workshop

The engagement with stakeholders is a key objective of EURAMET and its European Metrology Networks. In a recent workshop EURAMET introduced the concept and supported the consortium in defining priorities. The outcomes of the workshop, which was hosted by Thomas Damitz and Caroline Pritchard, will be used to create a communication strategy for a potential EMN on radiation protection regulation.

Recent & Upcoming Events

The consortium is currently preparing for the following meetings, conferences and workshops:

10 February 21	TC IR Meeting
18 February 21	Joint Meeting BoD / TC Chairs / EMN Chairs/WG Convenors
19 – 30 April 21	EGU 2021
In planning:	
05 May 21	supportBSS M12 project meeting

Update on the establishment of the potential EMN for Radiation Protection

Everyone in the world is exposed to environmental radiation and more than 23 million people around the world are exposed to ionising radiation in the workplace.

EMPIR

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

Due to new technological developments radiation exposure has been increasing for years. Thus, compliance with the corresponding legislation has become more complex due to stricter legal dose rate assessments, exposure limits and limits on activity concentrations.

An EMN for radiation protection regulation is needed as a central contact point to cover all metrological requirements in connection with radiation protection. Such an EMN under the umbrella of EURAMET is in under discussion and being prepared and supported by the EMPIR project 19NET03 supportBSS.

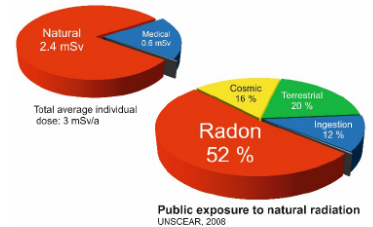


Figure 6: Public exposure published as published by UNSCEAR, 2008.

The partners of supportBSS, together with other organisations providing a service in the field of radiation protection, are preparing a proposal for the EURAMET General Assembly in 2021 to establish the EMN on radiation protection. The proposal and the Memorandum of Understanding (MoU) are nearly finished. The supporting Delegate from EURAMET is Jörn Stenger, the proposer is Annette Röttger. The final objective of the network project is to develop a plan for a harmonised, sustainable, coordinated and smartly specialised infrastructure to underpin the needs expressed in the European regulations for radiation protection.

Acknowledgements

The consortium is grateful to have this powerful support from colleagues worldwide! Further collaboration interest is welcome.

This project (19NET03) has received funding from the EMPIR programme co-financed by the Participating States and from the European Union's Horizon 2020 research and innovation programme.

Communication plans



Communication

A high-ranking Stakeholder Committee:

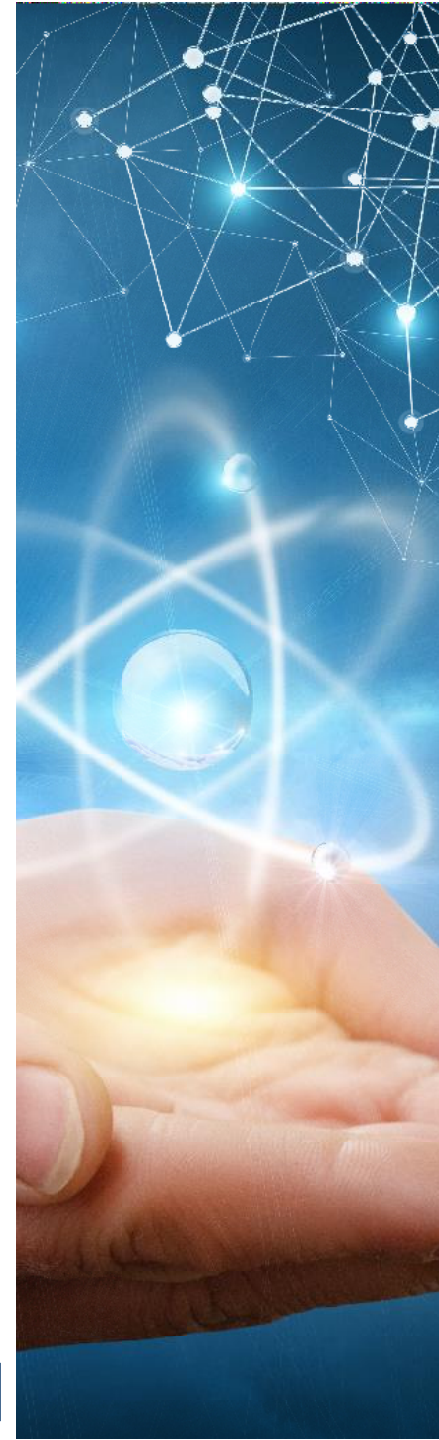
Fachverband für Strahlenschutz e.V., (Germany), Bundesamt für Eich- und Vermessungswesen (Austria), Bundesamt für Strahlenschutz (Germany), Bureau International des Poids et Mesures (International), Bundesministerium für Umwelt, Naturschutz und nukleare Sicherheit (Germany), developing EMN on medical use of ionising radiation, EURADOS: European Radiation Dosimetry Group e.V. (International), EURAMET e.V. Chair TC-IR (International), International Atomic Energy Agency (International), European Commission, Joint Research Centre (Belgium), Medizinische Hochschule Hannover (Germany), Radiation Metrology Ltd (United Kingdom), Society for Radiological Protection and BAE Systems (United Kingdom), Strahlenschutzkommission (Germany), Swedish Radiation Safety Authority (Sweden), Säteilyturvakeskus (Finland) and TU Wien (Austria).

Gap workshop on 11th September 2020:

A virtual workshop on gaps in radiation protection metrology. It was organised by the consortium of supportBSS. The so-called gaps in radiation protection metrology and capacities either in the scope of the Council Directive 2013/59/EURATOM or in some aspects of the EURATOM treaty were discussed and summarised in 6 parallel sessions. The topics considered most important in terms of radiation protection metrology are summarized in six main topics: TOP 1: reference fields; TOP 2: radiation protection quantities; TOP 3: education and training needs; TOP 4: measurement devices for radiation protection in medical or industry applications of ionising radiation or for environmental monitoring & handling and transmission of measurement data; TOP 5: activity standards; TOP 6: type testing: harmonisation and national requirements & radiation protection legislation, ISO standards, accreditation. The report on the workshop summarizes the results of the scientific stakeholder workshop and is meant to open a continuous and constructive dialogue on the identified stakeholder needs and gaps in metrology. **This workshop was attended by more than 100 experts from more than 40 institutes active in radiation protection worldwide** but mainly in Europe. A joint presentation from PTB, BfS, STUK, CRA, Radiation Metrology Ltd., IRSN, radonova and IAEA on the RAD 9 conference has been accepted.

CCRI webinar on radiation protection on 5th November 2020:

With an attendance of more than **150 experts** worldwide.
<https://www.youtube.com/watch?v=V2B77LyY62I>





Interaction and contributions on the European level:

Interaction with EURAMET together with TC-IR

and TC-IR working group “Ionising Radiation and Radionuclides in Environment, Energy and Industry”. By this intensive exchange, the developing ENM was able to provide information to EURAMET on the **Call Scope Green Deal/Pre- and Co-Normative/Research Potential** related to Green Deal, the Call Scope.

Direct contribution to EURAMETs strategic work:

By this intensive exchange, the developing ENM was able to provide information to EURAMET on the Metrology for Health (2022) on all topics of the 19th Joint Meeting TCC / EMNC / BoD / WG convenors Agenda and on the Horizon Europe Work Programme for 2021-2. Moreover, input was provided to Joint Workshop TC-IM WG M4D. The developing ENM was mentioned in the policy debate hosted by by IPQ and EURAMET on 5th May 2021.

Interaction and promotion from EURADOS:

In the **General Assembly of EURADOS e.V.**, EURADOS Chair **Filip Vanhavere** presented the potential **EMN IR Protect to an audience of 800 participants** worldwide to inform the members about the cooperation between EURAMET and EURADOS. In the annual meeting of EURADOS e.V., the consortium presented first results in the WG 3.3 with a special focus on the environmental aspects following the EMPIR environmental call in 2019 and preparing for the Green Deal call in 2021 of the potential European Partnership on Metrology.

Interaction and contributions **worldwide**:

Open to other RMOs:

Gap Workshop and CCRI Webinar, Newsletter distribution list is available and capacity building is planned.

Feel invited to join
and contribute!

Contribution and promotion from BIPM:

Support the proposal by providing expertise. The BIPM is already involved: They took part in the Gap analysis of the supportBSS project and they joined the Stakeholder Committee. A close cooperation with CCRI has been started in 2020 by exchange of information (virtual seminar on the planed EMN presented to the **CCRI members**).

Contribution and promotion from IAEA:

Support the proposal by providing expertise. The IAEA is already involved: They took part in the gap analysis of the supportBSS project and provided a **crosscutting overview on gaps in the international context** for the future EMN. They joined the Stakeholder Committee.



NMI/DI

non NMI/DI



**Physikalisch-Technische Bundesanstalt
Braunschweig und Berlin**

Bundesallee 100
38116 Braunschweig

www.ptb.de

05/21

