EMPIR Call 2020 – Networks

Selected Network Topic number: **SNT-w01**
Version: 1.0

Title: Support for a European Metrology Network for clean energy

Abstract

The recent European “Green Deal” includes a comprehensive policy framework for the climate and environmental challenges, which aims to put the whole economy and society on a more sustainable path and support European and international climate agreements. The Green Deal objectives can only be achieved through a coordinated collaboration of institutional, research, industrial and technological partners operating in different fields, and their implementation can be accelerated when supported by a network capable of coordinating the actions needed to provide metrological solutions, to indicate road maps and to duly respond to industrial needs. One important aspect of the Green Deal relates to clean energy, and whilst a number of the objectives related to clean energy, such as energy gases and smart electrical grids, are addressed by existing European Metrology Networks, there are several key technologies such as photovoltaic (PV), aeolian, fuel cells, batteries and energy conversion, transport and storage, still not covered.

Keywords

Clean energy, photovoltaics, wind energy, synthetic fuels, fuel cells, hydrogen, batteries, molten-salt storage, energy conversion, energy systems, sector coupling, energy efficiency

Background

The European “Green Deal” published by the EU includes a comprehensive policy framework for the climate and environmental challenges [1]. It aims to transform the whole economy and society to put it on a more sustainable path and to bring the net emissions of greenhouse gases to zero by 2050, thus supporting the EU’s climate ambition and the United Nations “Paris agreement” [2] and the Sustainable Development Goals (Goal 7: Affordable and Clean Energy; Goal 13: Climate Action; and Goal 17: Partnerships) [3].

The Green Deal is a technological challenge, and the ‘Clean energy’ policy area includes priority areas such as interconnected energy systems, innovative technologies (photovoltaic (PV), aeolian, fuel cells, batteries and energy conversion, transport and storage), energy efficiency and eco-design, offshore wind energy, decarbonisation of the gas grid and smart integration and promotion of EU standards. New or improved technologies have to or are being developed for clean and efficient energy generation, transport, storage and use, and this includes all TRLs, from basic research to industry-scale applications. Metrology support is key for these developments both in academia and industry.

In all the fields mentioned above, from PV to decarbonisation, it is essential to accurately determine all relevant quantities, since this will point the way forward to further technological improvements and innovations. Reliable measurements are also the building blocks for standardisation and regulation. Fair billing of energy, for example, relies on trustworthy traceable measurements. The efficiencies of PV, wind turbines and fuel cells have to be known to enable work on ever more efficient systems, and the same is true for quantifying the efficiency and energy losses in energy conversion, transport, storage, and entire energy systems.

The successful implementation of the Green Deal requires acceptance of its necessity and identification with its objectives in all parts of society. This in turn depends on reliable and trustworthy metrological data, which are necessary to evaluate and optimise the effectiveness of scientific solutions and political measures and to enable a fair distribution of the economic and social challenges of this transition.

Up to now, metrological research activities in the field of clean energy are mainly driven by individual institutes or are focussed on specific subject areas such as energy production or energy distribution. EURAMET’s technical committees are developing research strategies primarily within their technological areas. A cross-disciplinary approach is essential for the metrologically support of the challenge of energy transition in

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Europe. The European metrology community has to respond by developing larger-scale, long-term, cross-disciplinary approaches in interaction with the key stakeholders.

How and where NMIs should focus limited resources to obtain maximum impact for society urgently requires a strategic plan and significant coordination both at European and global levels. No single NMI has the expertise or resource to tackle all or even a significant fraction of the most critical priorities without collaboration. Without coordination, there is a strong likelihood of unnecessary duplication, with NMIs (nationally and/or regionally) potentially independently choosing to focus efforts on the same challenge with consequential neglect of others. EURAMET is considering establishing a European Metrology Network to coordinate the European NMI response, to establish close links to the stakeholder community, to develop and implement a strategic agenda and establish a knowledge, technology transfer and promotion plan, to ensure an effective response is put in place. This SNT is intended to elaborate how a network could support EURAMET and to support that network in its initial tasks.

Objectives

Proposers should address the objectives stated below, which are mainly based on the PNT submission. Proposers may identify amendments to the objectives or choose to address a subset of them in order to maximise the overall impact or address budgetary or scientific / technical / legal / regulatory / market constraints, but the reasons for this should be clearly stated in the protocol.

The JNP shall focus on developing a long-term ongoing dialogue between the metrology community and relevant stakeholders. This dialogue should support the take-up of research outputs from the metrology community, the collection of needs from stakeholders to inform future research and other activities and promote cooperation. In addition, the JNP should focus on developing a plan for a joint and sustainable European metrology infrastructure for clean energy via a future European Metrology Network.

The specific objectives are:

1. To identify and approach the key stakeholders in the fields of “Clean Energy” and establish regular a dialogue between the project and them to identify their needs and promote cooperation. This should encompass industry, regulatory bodies, research organisations and standards developing organisations, as well as existing and new networks, and should start from initially prioritised areas aligned to the European Green Deal policy area “Clean Energy”.
2. To develop a Strategic Research Agenda and roadmaps for clean energy considering the activities covered by the existing EMNs and taking into account feedback and the metrological needs of stakeholders identified in Objective 1.
3. To develop a Strategic Agenda, including the legal and organisational requirements for transnational joint use of unique metrological infrastructures, coordination of smart specialisation, and targeted capacity building.
4. To establish a contact point for all matters of metrology related to clean energy for stakeholders, which may include web-based tools. The contact point should be developed in a manner that allows it to be maintained by a future EMN.
5. To develop a plan for a multidisciplinary and sustainable European Metrology Network for clean energy. The plan should be completed within 12 months of the start of the project and should: (i) identify the scope of the EMN, with respect to the remits of other EMNs such as the Energy Gases EMN and the Smart Electrical Grids EMN, ii) use 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

The proposed activities shall be justified by clear reference to the measurement needs within strategic documents published by the relevant stakeholders. Proposers should establish the current state of the coordination in this area, and explain how their proposed project goes beyond this.

The proposed activities should not include those essential for the establishment and operation of the EMN. EMNs will be established and operated by the EURAMET members using their own national resources regardless of whether specific EMPIR proposals are funded. EMPIR funding is for specific tasks aimed at ensuring a proposed EMN will progress quickly towards its establishment and implementation and contribution to the objectives of the programme.

EURAMET expects the average EU Contribution for the selected JNPs in this TP to be 0.4 M€, and has defined an upper limit of 0.5 M€ for this project.

Potential Impact

Proposals must demonstrate adequate and appropriate participation/links to the “end user” community, describing how the project partners and collaborators will engage with relevant communities during the project to facilitate knowledge transfer and accelerate the sustainability of the organisation. Evidence of support from the “end user” community (e.g. letters of support) is also encouraged.

You should detail how your JNP results are going to:

- Address the SNT objectives and deliver solutions to the documented needs,
- Provide a lasting improvement to coordination in the European metrological community and communication with their stakeholders beyond the lifetime of the project,

You should detail other impacts of your proposed JNP.

You should also detail how your approach to realising the objectives will further the aim of EMPIR to develop a coherent approach at the European level in the field of metrology and include the best available contributions from across the metrology community. Specifically, the opportunities for:

- improvement of the efficiency of use of available resources to better meet metrological needs and to assure the traceability of national standards
- the metrology capacity of EURAMET Member States whose metrology programmes are at an early stage of development to be increased

Time-scale

The project should be of up to 3 years duration.

Additional information

The references were provided by PNT submitters; proposers should therefore establish the relevance of any references.

[1] The European Green Deal - Factsheet on Clean Energy 11/12/2019, Brussels; European Commission, https://ec.europa.eu/info/sites/info/files/european-green-deal-communication_en.pdf (Accessed on 10/02/2020)

[2] Paris Agreement – United Nations Treaty Collection; 14/03/2016, New York; United Nations https://treaties.un.org/doc/Treaties/2016/02/20160215%2006-03%20PM/Ch_XXVII-7-d.pdf (Accessed on 10/02/2020)

[3] Sustainable Development Goals Report 2019 – United Nations; ISBN 978-92-1-101403-7

[4] Horizon Europe - the next research and innovation framework programme; European Commission https://ec.europa.eu/info/horizon-europe-next-research-and-innovation-framework-programme_en (Accessed on 10/02/2020)