European Economic and Social Committee

INT/937
European partnership/Metrology

OPINION

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Proposal for a decision of the European Parliament and of the Council on the participation of the Union in the European Partnership on Metrology jointly undertaken by several Member States
[COM(2021) 89 final – 2021/0049 COD]

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Referral	European Parliament, 17/05/2021 Council, 05/05/2021
Legal basis	Article 114 of the Treaty on the Functioning of the European Union
Section responsible	Single Market, Production and Consumption
Adopted in section	11/05/2021
Adopted at plenary	09/06/2021
Plenary session No	561
Outcome of vote (for/against/abstentions)	229/0/3

1. Conclusions and recommendations

1.1 The EESC welcomes the Commission proposal for a European Partnership on Metrology as this supports research and innovation in advanced communication technologies such as 5G, the internet of things (IoT), the smart grid and smart homes, next-generation automotive technologies and smart manufacturing, to name a few.

1.2 The EESC considers the proposal to be an important step towards a European economy that aims to be at the forefront of industry, technology and digitalisation. Advance metrology can play a supporting role in some of Europe's biggest challenges, from healthcare to climate change. However, harmonisation and cross-border compatibility in metrology is key to all this.

1.3 The EESC is of the view that European Metrology Networks (EMN), with their strong focus on stakeholders and their needs, will contribute more effectively towards the research and innovation agenda of the European Partnership on Metrology.

1.4 The EESC also welcomes the funding of joint research projects in this area as this will no doubt accelerate innovation using metrology solutions, capabilities and infrastructure. This is likely to enhance opportunities for new or significantly improved products and services produced or provided by EU companies.

1.5 The EESC believes in the importance of engagement with stakeholders along the metrology value chain to maximise uptake of emerging technologies and contribute to addressing major societal challenges.

1.6 The EESC is also of the view that enhancing Europe's competitive edge in emerging technologies and new product development can only be maintained by adopting a pan-European approach to metrology. This proposal supports this objective by avoiding fragmentation in identifying metrology solutions in the EU.

1.7 The EESC emphasises the importance of metrology as an integral part of the innovation required to support economic recovery across the EU as well as the commitment on the part of Metrology Institutes to support collaborative research and innovation in metrology. The EESC also notes that advanced metrology helps reduce energy consumption and achieve climate change targets in line with Next Generation EU objectives.

1.8 The EESC recognises the role that improved and harmonised measurement and standards could play in the efficient functioning of the Single Market, particularly when EU citizens have adequate information about the products available in the Single Market. Advanced metrology helps achieve this as well as reducing transaction costs associated with participating in the Single Market.

1.9 The EESC believes that precise measurement standards must be accessible and understandable to all stakeholders involved, particularly small businesses and consumers. This will reap significant benefits for the EU's economy as it emerges from its COVID-induced slowdown,

particularly as it transitions towards a greener, more digital Europe, while also promoting trust along the entire supply chain.

1.10 Finally, the EESC highlights the evident need to raise awareness among EU citizens of the importance of metrology in areas such as healthcare, manufacturing, advanced communications technologies and the safety of workers in the workplace.

2. Background

2.1 Metrology deals with the scientific study of measurements with respect to industry standards and various units of parameters. Measurements are essential for innovation as they not only impact quality but also influence different technical parameters. In the manufacturing industry, for instance, metrology allows companies to meet consumer design specifications; expected functional outcomes; and compliance regulations and standards.

2.2 Measurement techniques are constantly evolving and this together with rapid technological advancement is supplementing the demand for accurate and reliable metrology products. In response to this, on 23 February 2021, the European Commission published its proposal for a Decision of the European Parliament and of the Council on the participation of the Union in the European Partnership on Metrology jointly undertaken by several Member States.

2.3 Metrology was acknowledged by the co-legislators as one of the priority areas identified for possible Institutionalised European Partnerships based on Article 185 or Article 187 TFEU under the Horizon Europe Regulation. The present proposal for a European Metrology Partnership builds on the lessons learnt from the European metrology research programme (EMRP) and the European metrology programme on innovation and research (EMPIR). However, the present initiative represents a new partnership to meet new challenges. It is not intended as a mere continuation of previous programmes.

2.4 The Metrology Partnership shall, through the involvement and commitment of partners in designing and implementing a programme of research and innovation activities, pursue the following general objectives:

a) to develop a sustainable coordinated metrology system on a European level;
b) to ensure that state-of-the-art metrology capabilities are taken up directly by innovators in their ecosystems;
c) to increase the impact of metrology on societal challenges in relation to the implementation of policies, standards and regulations to make them fit for purpose.

2.5 When implementing the general objectives set out above, the Metrology Partnership shall pursue the following specific objectives:

a) to develop by 2030 new research capabilities which are built within the framework of new European Metrology Networks and which perform in terms of calibration and measurement capabilities at least equal to the leading metrology institutes outside the Participating States;

b) to support, by 2030, sales of new innovative products and services through the use and adoption of the new metrology capabilities in key emerging technologies;
c) to contribute fully and effectively, by 2030, to the design and implementation of specific standards and regulations that underpin public policies addressing societal challenges.

3. General comments

3.1 The world is facing an economic crisis caused by the COVID-19 pandemic. As has happened to other markets, this has also led to a decline in the growth rate of the industrial metrology market, especially in 2020 and 2021. This is because organisations in most of the major demand-generating verticals are currently, or were, non-operational in various countries, thereby negatively impacting the industrial metrology market. The COVID-19 pandemic has also impacted operations on a massive scale, and manufacturers are facing the challenge of assessing the impact. Past and current lockdowns resulting in the shutdown of manufacturing facilities have put a lot of strain on the industrial sector.

3.2 Prior to the global pandemic, the market had witnessed significant growth over the past years, mainly owing to the rising demand for big data analytics, and increasing demand for automobiles in emerging economies. In the future, however, the global industrial metrology market is expected to grow from USD 9.8 billion in 2021 to USD 13.2 billion by 2026. The reasons for this are the increasing adoption of cloud services in the integration of metrological data and the increase in demand for metrology in industry. The latter shall considerably boost the industrial metrology market in the coming years with the hardware segment expected to dominate the industrial metrology market.

3.3 Europe as a global player faces increased global competition in metrology in terms of scale and focus of investment as well as long-term financial commitment to metrology objectives. In the last decade, the US, China and India increased their investments in metrology by 60%, 50% and 52% respectively. Investments in European institutes, however, remained relatively static and did not respond to new and increasingly important research fields. The apparent inadequate level of investment in Europe, coupled with the fragmentation of metrology capabilities, has resulted in efforts being spread out too thinly, without any strategic focus and a relative inability to capitalise on potential economies of scale and strategic complementarities.

3.4 In recent years, related investments outside the EU have surpassed those within the EU. In the US, for example, the National Institute of Standards and Technology (NIST), which is the country's national metrology institute, has a comparatively huge annual budget for its research programme for fundamental measurements and quantum science. The same applies for the National Institute of Metrology (NIM) in China with its targeted research programme for metrology. By comparison, PTB, the national metrology institute (NMI) in Germany and the largest in Europe, covers both research and metrology services for industry and society with its budget.

3.5 The EU's global competitors are making these strategic investments because of the growing need for metrology solutions targeting emerging technologies and new product development. In the Asia-Pacific region, for instance, the rapid increase in industrialisation and rapid evolution

of technology is driving market demand. The surge in demand for high quality products in manufacturing and automation sector in countries like China, India and other growing economies is in fact fuelling the expansion of the metrology market in this part of the world.

3.6 Evidently, the metrology market is growing because of an increase in demand for accuracy and precision measurements in multiple industries with the consequence of increasing competition among the key players in the global metrology market such as Carl Zeiss (Germany), Hexagon AB (Sweden), Mitutoyo Corp. (U.S.), Renishaw (U.K.), Nikon metrology (Belgium), Metrology software products Ltd. (U.K.), 3D Digital Corporation (U.S.), Perception Inc. (U.S.) and Faro Technologies (U.S.) and others.

3.7 The metrology market can be segmented on the basis of type, product and end-users. On the basis of type, it is segmented into industrial metrology, scientific metrology and legal metrology. On the basis of products, the market is segmented into coordinated measuring machines (CMM) and optical digitisers, 3D scanners, laser trackers and others. On the basis of end-users, the market is segmented into aerospace, automotive, consumer electronics, industrial, energy and power among others. On the basis of region, the global metrology market is segmented into North and South America, Europe, Asia-Pacific and the rest of the world. Europe has the potential to be a dominant player with an increasing share in the global metrology market and this can be achieved with further technological advancement and investment in research.

4. Specific Comments

4.1 Reliable measurements are essential for innovation in economies and societies: metrology, the science of measurement, is vital for scientific research, trade and industry. New societal challenges and emerging technologies increase the need for accuracy, precision and novel measurement capabilities. Advanced communication technologies such as 5G, the internet of things (IoT), the smart grid and smart homes, next-generation automotive technologies and smart manufacturing, to name a few, all depend on advances in metrology. Hence, the EESC welcomes the Commission proposal for a European Partnership on Metrology.

4.2 The EESC considers the proposal as a building block for a European economy that aims to be at the forefront of industry, technology and digitalisation. It also recognises the important role the metrological infrastructure can play in innovation and tackling some of Europe's biggest challenges, from healthcare to climate change. Though individual Member States and individual systems may have their own specificities, achieving harmonisation and cross-border compatibility in metrology is an important objective and one which the EESC fully supports.

4.3 The establishment of sustainable EMNs in highly competitive and emerging areas, able to compete with the top global performers, is crucial for the future of European economies and could also support economic recovery following COVID-19 and its effects. The EESC considers that EMNs, with their strong focus on stakeholders and their needs, will contribute more effectively towards the research and innovation agenda of the European Partnership on Metrology.

4.4 The EESC also welcomes the funding of joint research projects as this will no doubt accelerate innovation using metrology solutions, capabilities and infrastructure. This is also likely to enhance opportunities for new or significantly improved products and services produced in the EU or by EU companies based in third countries. Moreover, financial support for joint research projects would boost efforts to increase and coordinate the role of metrology in the design and implementation of more evidence-based public policies.

4.5 The EESC also believes that the engagement with stakeholders along the metrology value chain to maximise uptake of emerging technologies and contribution to addressing major societal challenges is very important. A European Partnership on Metrology would also support a wide range of European policies, commerce and public services. In addition, further opportunities for Public Private Partnerships (PPPs) could help accelerate Europe's global lead in metrology research and stimulate new innovative products, responding to new demands for precision-products.

4.6 The EESC is also of the view that enhancing Europe’s competitive edge in emerging technologies and new product development can only be maintained by adopting a pan-European approach to metrology. This proposal supports this objective by avoiding fragmentation in identifying metrology solutions in Europe which could and place Europe at the top of global performers in providing metrology services for existing, complex measurement challenges and new technologies. This approach also supports Small and Medium Enterprises (SMEs) that rely on metrology in both research and services in the development of quality products.

4.7 The EESC emphasises the importance of metrology as an integral part of the innovation required to support economic recovery as well as the commitment on the part of Metrology Institutes in the EU to support collaborative research and innovation in metrology. At its core, metrology links science and economic activity closely as measurement is a cornerstone for economic transactions, optimisation of production, consumer and business confidence and innovation. Advanced metrology also allows companies to have an optimum scale of production which results in carbon neutrality. Hence, reducing energy consumption in industry is consistent with one of the main objectives of the Recovery and Resilience Facility of Next Generation EU. Furthermore, ongoing research and innovation in metrology supports both innovation and climate change targets. Also relevant is that advances in metrology support public services in implementing regulation much more effectively than is the case today.

4.8 The EESC also identifies further economic benefits resulting from research and innovation in metrology, namely limiting market failure, reduced transaction costs, and increased overall economic efficiency. Improved and harmonised measurement and standards could play an important role in the efficient functioning of the Single Market. It would operate far more efficiently or effectively if EU citizens have adequate information about the products available in the Single Market. Asymmetric information between buyers and sellers is one of the most common sources of market failure, which occurs when the buyer cannot determine with a high degree of accuracy the quality of a product. Through the provision of more advanced measurement and standards, buyers can measure the quality of products given there are agreed standards and they can therefore differentiate between lower and higher quality products. This

then eliminates the asymmetric information, as well as correcting the market failure present, thus increasing the efficiency of the Single Market.

4.9 Another obstacle to the Single Market is transaction costs associated with participating in an economic exchange. Transaction costs arise as a result of the information between consumers and producers being asymmetric and incomplete. This could be addressed by more advanced metrology with the buyer spending less time searching for goods if he or she is assured about the quality of the product being purchased. Clearly, the need for standard, transparent and seamless measurement is critical, both for clients/consumers and businesses.

4.10 In effect, advanced metrology benefits producers in the design of products in accordance with a standard. This allows producers to incur fewer costs associated with correcting defects to meet specifications. This, in turn, facilitates certification and consumer trust in the certification and performance of a product.

4.11 A further point worth mentioning is the continued need for measurement standards and units to be not only accurate and transparent but also accessible and understandable to all stakeholders involved, particularly small businesses and consumers, who form the backbone of the EU economy. This will not only assist in overcoming the market challenges mentioned above, but also reap significant benefits for the EU's economy as it emerges from its COVID-induced slowdown, particularly as it transitions towards a greener, more digital Europe, while also promoting trust along the entire supply-chain. Thus, such considerations related to accessibility must be at the forefront of any strategy aimed at boosting investment in advanced metrology.

4.12 Finally, the EESC highlights the evident need to raise awareness among EU citizens of the importance of metrology. Companies rely on metrology to produce precise specifications for a quality final product which, in turn, meets market demand. Industries turn to advanced measurements to scale up production, including for vaccines, and avoid huge losses. Metrology also makes manufacturing plants safer for workers. Just as important is the relevance of metrology in support of emerging technologies such as quantum technology and so the EU needs to enhance its capacity to develop advanced metrology systems and rely less on other competitor nations.

Brussels, 9 June 2021.

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The president of the European Economic and Social Committee