General Information	
Preliminary title of the European Partnerships	European Metrology Partnership - *Towards a European Metrology Area*
Short description of the partnership	Accelerating Europe's global lead in metrology research, and creating European networks for emerging metrology areas, which will contribute to Europe's wider competitiveness, and incorporating a wide range of new stakeholders.
Services directly involved	RTD.D2
Context and problem definition	A European Partnership in Metrology would build on the momentum of previous initiatives in metrology, the science and traceability of measurements, in which the Member States pool the majority of national resources into a single initiative to achieve a global competitive advantage that could not be attained otherwise. The focus now is to create specialised metrology networks across Europe to respond to new global challenges, which will ultimately contribute to an efficient metrology capacity closely interlinked with the Single Market. The only way to accomplish this strategically is through a European Partnership. ▪ Previous initiatives in metrology, such as EMPIR under Horizon 2020, have shown an increased level of research collaboration across Member States and more importantly joint strategies for emerging needs in metrology capacity and infrastructure at European level. While momentum towards further collaboration is present, there is still a gap in achieving a truly European Metrology Area. ▪ A fragmented European metrology system leads to the main problem, which is the lack of capacity to confront new technological developments and more specifically their deployment in commercial environments. ▪ All industrial actors and related stakeholders are affected by this fragmented system that eventually will affect the functioning of the Single Market. Thanks to previous initiatives, such as EMPIR, more than 340 million euros have been leveraged by the private sector, as a direct benefit of the outcomes of the research projects, including private investments and commercialisation of new metrology techniques. ▪ In addition, a functioning European metrology system is also essential for trade, digitalisation, health, energy/resources, and security. The absence of an EU intervention would result in missed opportunities in terms of enhancing the competitiveness of the Single Market, and delivering economic and social benefit for European citizens. ▪ Europe's lead in metrology development is particularly visible in areas such as the redefinition of the international base units for measurements, the SI units (Système International d'unités). This area is of key importance for e.g. an effective trade system.
Objectives and expected impacts	▪ **Main objective**: The initiative will create, by 2030, a sustainable system for metrology that will be able to provide the R&I support in the future, without the need for further structural funding through an institutionalised partnership. This milestone will be accomplished by the end of the proposed Partnership, and should encompass a full range of strategic application areas that are especially important for Europe. ▪ For emerging fields, in which pooled efforts across borders give higher impact, European metrology networks will be created. The objective of the European metrology networks will be to create a European infrastructure that provides services, performs research, supports policy development and ensures a technological expertise within the specific area of the network.

	▪ The main benefits to the users of metrology, including industry, policy makers, social services such as health as well as the scientific community, will be a coherent European metrology system for advanced technologies. The ultimate goal is that by the end of the partnership, users will have a single European interface to metrology services for specific applications via the networks. While the networks will ensure a coherent infrastructure through Europe, in respect with national mandates for metrology services, the initiative and the networks will also include the entire chain of metrology stakeholders, including industry. This inclusion will enable the initiative to strike a balance between the push for strategic planning for emerging technologies and the pull by downstream users of metrology services that will define how the metrology system will work beyond the end of the Partnership. ▪ The initiative will also draw clear synergies with the actions from major European policies, such as the Digital Single Market, the Energy Union, and the Trade Policy. ▪ The future initiative will enable private investment leverage superior to the targets of the current initiative under Horizon 2020 and past initiatives. ▪ Milestones will be set throughout the lifetime of the Partnership to ensure the convergence of the actions to the overall objective. At the start, the Partnership should propose a set of several networks that could show relevance and potential to achieve the final objective. A mid-term review will validate the initial functioning of the first networks. The end of the Partnership, the networks should be mature enough to be independent and self-sustaining without any structural funding from the institutionalised partnership. ▪ The objectives are in line of realising the Single Market, and will be in particular relevant for the implementation of the Digital Single Market and the Energy Union. Examples of the contributions to the Digital Single Market include the rolling out of 5G applications and financial services requirement accurate time stamping. Within the priorities of the Energy Union, a powerful example is the expected direct contribution by the Partnership to the European-wide smart grid installations.
Necessity test: rationale for a European Partnership	▪ Metrology is a cross-border concept, where consensus and unified understanding of how to measure a certain quantity are crucial elements. Metrology is confined within national institutionalised programmes. The national metrology institutes, the NMIs, own the mandates to perform these programmes at the first level of intervention. In addition, they represent the countries on an international level, and ensure that the international mutual recognition arrangements are respected. These core partners need to integrate their capacities to effectively respond to common challenges. To achieve this strategically, classical calls under Horizon Europe are not enough. ▪ Emerging technologies require a European approach, since the level of complexity cannot be solved by one country alone, and the critical mass for a validated metrology technique requires a transnational competence. ▪ Responding to the need from applications of emerging technologies, and building up metrology capacity requires large scale strategic investments that are most efficient at a European level will avoid fragmentation of Europe's capacity and ensure a global leadership in metrology. ▪ Only a fully working metrology infrastructure will allow the industrial uptake of innovations and the commercialisation of future products and applications. ▪ There is furthermore a need for a partnership that works in close cooperation with policy makers to ensure a regulatory support in many policy initiatives formed at a European level, such as new

	communication standards, climate change monitoring, and vehicle emission standards.
Relevant for the following parts of Horizon Europe	Pillar II 'Global Challenges and European Industrial Competitiveness' ☒ Cluster Health ☒ Cluster Culture, creativity and inclusive society ☒ Cluster Civil Security for Society ☒ Cluster Digital, Industry and Space ☒ Cluster Climate, Energy and Mobility ☒ Cluster Food, Bioeconomy Natural Resources, Agriculture and Environment ☒ Cross-cluster ☒ Pillar III 'Innovative Europe'
Currently identified links with other partnership candidates / Union programmes	▪ FET Flagships, in particular Quantum (also direct involvement in Quantum related capacity building) ▪ Carbon Neutral and Circular Industry ▪ Made in Europe ▪ Smart Networks and Services ▪ Key Digital Technologies ▪ AI, data and robotics ▪ Towards zero-emission road transport (2Zero) ▪ Mobility and Safety for Automated Road Transport ▪ Clean Aviation ▪ Global Competitive Space Systems ▪ (Uptake and validation of) Horizon Europe missions
Does the proposed partnership build on currently active ones?	Under Horizon 2020: European Metrology Programme for Innovation and Research (EMPIR). Last calls planned for 2020, with projects running until 2024. The main new features in the new Partnership include the creation of metrology networks, and the inclusion of a wider set of stakeholders for the use of metrology services, infrastructures, and for policy support towards regulations and standardisation.
Expected type and composition of partners	▪ The Partnership will require a long-term commitment from the national metrology institutes together with the institutional funding made available from the Participating States. ▪ The co-funding from the Participating States will need to be at least at the same level as the Union funding. ▪ In terms of participation, in order to achieve this level of commitment, it is important that the national metrology institutes play a central role in order to achieve full coherence with national strategies and to respect the national mandates that enable the national institutional funding. ▪ The processes for inclusion of new stakeholders will encompass both workshops and working groups for the definition of priorities, participation in research projects, and advisory committees in the networks. Furthermore, activities such as services and access to infrastructure within the networks will allow for the full chain of metrology stakeholders to be involved. Regarding participation in the projects, it is expected that industry, academia, and research organisations participate actively, and are represented above the percentages achieved of the past and current European metrology initiatives. ▪ The ambition of the Partnership should be to extend the programme to new Participating States in Europe. The benefit would be to further reduce the fragmentation of the metrology landscape.

Contributions and commitments expected from partners	▪ **Participating States**: To provide at least the same amount of funding as the Union funding, in the form of cash contributions for administrative costs, and institutional in-kind contributions for project implementation and related activities within the European Metrology Networks. ▪ **European Union**: Financial contributions to the project grants. ▪ **European Metrology Networks**: activities/resources linked to industrial and societal needs (including exploratory service schemes for emerging technologies and applications), regulatory support activities, policy uptake within the field of specialisation ▪ **Industry**: Active and unfunded participation in the projects and in the networks, commitment of private leverage/investment in applications related to the project results ▪ **Other stakeholders**: Active participation in the projects and in the networks, contributions to standardisation and policy making
Currently envisaged implementation mode(s).	☐ Co-programmed European Partnership ☐ Co-funded European Partnership ☒ Institutionalised European Partnership ☒ Article 185 ☐ Article 187 ☐ EIT-KIC
Justification of the implementation mode	Factors for identifying the best suited form of European Partnerships are e.g.: ▪ Only an institutionalised partnership under Art. 185 TFEU would enable the metrology community and the interested industries to achieve the overall objectives. It would allow for the leveraging of the national institutionalised budget by partnering with the national metrology institutes in a public-public partnership. It would exploit the current momentum in creating a coherent landscape of metrology capacity in Europe and the knowledge of bringing a wide set of stakeholders together. ▪ Only an Article 185 initiative will allow for the creation of sustainable metrology networks that will not need Partnership funding beyond the end of the Partnership under Horizon Europe. ▪ The vast scope of activities of the networks permit a progressively larger participation of industry and other stakeholders throughout the metrology and quality infrastructure in Europe that have so far not been a part of any initiative at European level. ▪ The coordinated efforts under Art. 185 by the Participating States allows for rapid mobilisation of emerging policy challenges, such as new communication standards, health epidemics, and disruptive technologies. ▪ Governance: the past and current metrology initiatives under Art. 185 have shown that the current governance model has many advantages compared to other implementation modes. The dedicated implementing structure (DIS) has a strong experience in the implementation as well as creating a natural forum for the programming committee formations with the institutional partners. The structure will also benefit from the other activities of the DIS in which further strategic inputs and knowledge exchange can occur with the wider stakeholder communities. The current governance structure is the only one that would allow an effective building of the European Metrology Networks, where the national metrology institutes are expected to play a coordinating role.
Proposed starting year	2021