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Annex 8

Memorandum of Understanding for the Co-programmed European Partnership for Photonics

The Photonics21 Association, representing the partners other than the Union (its constituent entities[1]), the registered offices of which are c/o Anne De Moor BV, Rijvisschestraat 124, 9050 – Ghent (Zwijnaarde), Belgium, hereafter referred to as the "Partners other than the Union", and the European Union, represented by the European Commission, (jointly hereinafter referred to as "the Partners"),

Considering that:

- Parts of Horizon Europe – the Framework Programme for Research and Innovation ('Horizon Europe') [2] – may be implemented through Co-Programmed European Partnerships, on the basis of a Memorandum of Understanding between Partners determined to support the development and implementation of research and innovation activities of strategic importance to enable the Union to address global challenges and maintain its competitiveness in line with EU priorities, including the Sustainable Development Goals;
- The Strategic Plan for Horizon Europe [3] has identified a candidate for a Co-Programmed European Partnership for Photonics, considered instrumental to deliver scientific, economic and societal impact in line with the Horizon Europe objectives;
- The proposal received from the Partners other than the Union has been positively assessed by the European Commission in that it fulfils the new ambition and the selection criteria referred to in Article 10 and Annex III of Regulation (EU) 2021/695 of the European Parliament and of the Council[4] ('Horizon Europe');
- The implementation, monitoring and evaluation of the European Partnerships will comply with the criteria referred to in Annex III of Horizon Europe, including an alignment with Horizon Europe monitoring and evaluation provisions, set out in Article 50 and Article 52, as well as Annex V on Key Impact Pathways;
- The multi-annual Strategic Research and Innovation Agenda (SRIA) agreed by the Partners will provide the basis for the development of the co-operation under this

[1] Constituent entities are the members of the Association.
[2] Regulation (EU) 2021/695 of the European Parliament and of the Council of 28 April 2021 establishing Horizon Europe – the Framework Programme for Research and Innovation, laying down its rules for participation and dissemination (OJ L 170, 12.5.2021, p. 1–68.)
[3] https://op.europa.eu/en/web/eu-law-and-publications/publication-detail/-/publication/3c6ffd74-8ac3-11eb-b85c-01aa75ed71a1
[4] OJ L 170, 12.5.2021, p. 1–68.

Memorandum of Understanding, and for defining the annual priorities in line with the Strategic Plan for Horizon Europe;

- Regulation (EU) 2020/852 [5] establishes the general framework for determining whether an economic activity qualifies as environmentally sustainable for the purposes of defining sustainable investments. It creates a common reference that investors, banks, industry and researchers can use when investing in projects and economic activities that have a substantial positive impact on climate and environment and no significant harm on any of them. It is the reference for green investments in the Union;
- Funding sources other than Horizon Europe (other Union programmes as well as external funding sources, including those from Member States) will be explored in order to contribute to the achievement of objectives of the Co-programmed European Partnership in line with Horizon Europe objectives;
- The EC's ambitious new Industrial Strategy "Making Europe's businesses future-ready: A new Industrial Strategy for a globally competitive, green and digital Europe" [6] names Photonics among a list of Key Enabling Technologies (KETs) which are vital to the industrial transformation of Europe by 2030 [7]. Photonics is one of the critical technologies that are "essential key enabling building blocks for the digital transformation of Europe which will be based on deep technologies" stated the European Investment Bank in its report on "Financing the digital transformation"[8]. The development of photonic core technologies and their use and spill over in the many different fields of application will be essential for implementing the priorities of the new EU Commission. To this end, achieving technological sovereignty in Photonics is important for Europe;
- Photonics as a key digital technology will contribute to implementing the priorities of the new EU Commission. In particular, the priorities on "A European Green Deal", "Europe fit for the digital age" and "Protecting our European way of life" will depend on the development of photonics technologies and their implementation in Europe;
- For Europe to become a CO2-neutral society by 2050, the economy and society will need to make a step-change in becoming cleaner and greener on every level. Photonics is a key enabler for making this transition in a sustainable and competitive way. By applying photonics, it will be possible to greatly reduce the depletion of resources by managing material streams in a circular economy; significantly reduce energy consumption in buildings and public spaces; create efficient industrial processes; enable smart mobility and monitor our environment in real-time. Green photonics is a powerful, indispensable toolkit for mastering all these challenges. Photonics has the potential to reduce global CO2 emissions by up to 3 billion tonnes by 2030 [9];

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[5] Regulation (EU) 2020/852 of the European Parliament and the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088 (OJ L 198, 22.6.2020, p. 13).

[6] https://ec.europa.eu/commission/presscorner/detail/en/ip_20_416

[7] https://www.photonics21.org/2020/new-strategy-shows-photonics-key-to-europe%E2%80%99s-industrial-future-

[8] "Financing the digital transformation: Unlocking the value of photonics and microelectronics"; 2018, Report by European Investment Bank & European Commission

[9] https://www.photonics21.org/download/ppp-services/photonics-downloads/Study_GreenPhotonics_2020_final.pdf

- Pursuant to Article 3 of the Statutes of the Photonics21 Association, the Partners other than the Union engage in the European Partnership for Photonics with the European Commission to promote, facilitate and carry out the research, innovation, dissemination and other activities aiming at market, regulatory and societal uptake, including workforce training, necessary to achieve the objectives specified in Section 1 below;
- This Memorandum of Understanding constitutes an agreement in which the Partners will undertake all efforts necessary to achieve the objectives. It is not legally binding and does not, and will not, create any contractual or pre-contractual obligations under any law or legal system. Nothing in this Memorandum of Understanding will be construed as creating any liability, rights, waiver of any rights or obligations for any Partner or as releasing any Partner from its legal obligations. Neither Partner should be liable under this Memorandum of Understanding towards the other Partner;

Have agreed the following:

1 Establishment, general, specific and operational objectives

The Co-programmed European Partnership for Photonics, hereinafter referred to as "the Co-programmed European Partnership", is agreed between the Partners, to be implemented in an open, transparent, efficient and flexible way.

This Memorandum of Understanding sets out a cooperative relationship for the duration of the Co-programmed European Partnership with a long-term common vision, and the Partners pledge to pursue this common vision throughout the duration of this Partnership. It will contribute to the objectives of Horizon Europe, and the Strategic Plan.

The general objectives of the Co-programmed European Partnership are defined as follows:

GO1 Foster a focused, continuous and synergetic development of key photonics technologies, components and systems in Europe;

GO2 Push – by a close and early collaboration with up-and-downstream industries – for the rapid diffusion into the various sectors that critically depend on innovative photonics solutions;

GO3 Provide a framework for the shaping of ecosystems to address changes of value creation.

The specific objectives are the following:

SO1 **Fully exploit the potential of photonics for a digital, green and healthy future in Europe** by providing critical components and systems and processes for next generation applications, products and processes relevant to societal and economical challenges.

SO2 **Securing Technological Sovereignty for Europe** by maintaining leadership in core photonics technologies as well as in the application of photonics through ensuring common

strategic research and investment commitment by the photonics industry, the downstream end-users and the European Commission.

SO3 Raise the International Competitiveness of Europe's economy and ensure **Long-term Job and Prosperity creation** in Europe, not only for the photonics industry itself but also the up- and downstream enabled industries utilising photonics technologies. In this context, the need to increase the uptake of technology and its translation into new products and services is also addressed.

The operational objectives are the following:

OO1 Fully exploit the potential of photonics for a digital, green and healthy future in Europe

- Integration of relevant stakeholders representing downstream science and end-user industries as well as societal challenges
  - By 2022 new stakeholders account for 30% of the members of the Application Workgroups.
  - By 2024 specific joint research priorities are identified in the application work groups in the sense that R&I on a combination of photonics and other technologies are addressed.
  - By 2027 a significant number of new R&I cooperation agreements, that involve photonics and application partners are established.
- Joint calls with other European Partnerships
  - By 2022 each application work group of the Photonics Partnership has established a continuous exchange with at least one other European Partnership.
  - By 2025 each application work group has prepared R&I priorities for at least one joint/collaborative call with another European Partnership.
- Increase the uptake of photonics technology and its translation in up- and downstream value chains into solutions for societal and economic challenges (contributes also to General Objective 3)
  - By 2022 specific areas for action are identified and prioritised to further buildout prototyping services and manufacturing pilot lines aiming to speed up the market entry and roll-out of innovative Photonics technologies and photonics-enabled solutions.
  - By 2024 relevant players from the key enabling technologies will have committed to building up a European wide lab-to-fab infrastructure (Digital Innovation Hubs) supported by the European Commission. This infrastructure implements testbeds, as well as low-threshold access to R&I infrastructure and co-working spaces that, in particular, support SME and entrepreneurs.

OO2 Securing Technological Sovereignty for Europe

- Identify critical technologies and corresponding parts of value chains
  - By 2022 the Photonics Partnership – together with the value chain partners – has identified and prioritised critical technologies, applications and systems which gain from photonics technologies and systems and develop proposals for measures to

safeguard European sovereignty in these areas and to secure the relevant parts of the corresponding value chains.

- Train tomorrow's specialists today
  - By 2023 the Photonics Partnership – together with its value chain partners in the application-oriented workgroups – has elaborated a coordinated public-private plan to define relevant skill sets and curricula for professions in photonics and its value chain partners. It aims especially for
    - strengthening advanced skills in photonics and relevant corresponding fields and a close exchange on a systems-level (e.g. in the respective Digital Innovation Hubs),
    - supporting the design of trainings for SMEs, Entrepreneurs and the affected workforce,
    - supporting the design of long-term training and master's courses for students, and
    - fostering life-long learning as well as on-the-job training and traineeships for the workforce of the photonics and photonics enabled industries.
- Commitment to a close cooperation
  - By 2024 relevant players in Europe – representing industry and research institutions as well as politics, NGO and citizens – will have committed to an agenda that aims for securing technological sovereignty in photonics and safeguards relevant parts of the corresponding value chains.

OO3 International Competitiveness and Long-term Job and Prosperity creation

- Speed up the uptake of technology and its translation into new products and services (as already mentioned above but with a focus on economic challenges here). In addition to the above-defined specific objectives:
  - By 2022 specific areas for action are identified to build up ecosystems that support the enhancement of photonic and/or photonics enabled products, applications and processes by data-based services, e.g. providing parameters for laser material processing based on huge data pools or the collaborative condition monitoring based on photonic sensors.
  - By 2022 in the above-mentioned context, the appropriateness of the regulatory framework is discussed.
- Join forces of the many SME in the fragmented field of photonics by a commitment to joint strategic research agendas in the different application areas
  - By 2021 first drafts based on the broad involvement of relevant stakeholders will be presented.
  - By 2022 the partners other than the Union propose measures for the consideration of the European Commission that aim for enhancing the SME quota participating in funded R&I projects, e.g. by lowering the threshold, reducing bureaucracy and raise the success rate especially for SME when applying for funding and by close cooperation with the EIC.
  - By 2022 the Photonics Partnership will have achieved the commitment of 50 new industrial stakeholders on these Joint Strategic Research Agendas in the different application areas in the sense that the high leverage effect of today's Photonic21 community is maintained.
  - By 2025 this commitment will involve 100 new industrial stakeholders and thereby will act as a pacemaker for photonics SME in Europe.
- Boost opportunities for entrepreneurship in the photonics sector

- By 2022 the partners other than the Union propose specific measures for the consideration of the European Commission to improve the access to risk finance, e.g. by establishing a Europe-wide fund or funds for deep technology start-ups, SMEs, industries in growth status and/or in close cooperation with the EIC and EIB;
- By 2025 the partners other than the Union propose public measures for the consideration of the European Commission to incentivise and leverage additional private venture capital.

2 Contributions and activities by the Partners

Any Union contribution, provided through the Horizon Europe Framework Programme to the Co-programmed European Partnership, will be used to fund research and innovation activities, implemented as indirect actions following open calls for proposals and contests. These activities will be subject to the Horizon Europe Rules for Participation and Dissemination.

The European Commission envisages to dedicate up to EUR 340 million to actions within the scope of the Co-programmed European Partnership[10].

The Partners other than the Union will provide input and advice to the European Commission in order to contribute to the identification of priorities of research and innovation activities and the definition of call topics to be included in the Horizon Europe Work Programmes **within the scope of the Co-programmed European Partnership's activities.**

Furthermore, the **Partners other than the Union envisage[11] to dedicate up to EUR 340 million** for the period 2021 - 2030[12] in research, innovation and other activities in the area of the Co-programmed European Partnership, engaging their constituent and affiliated entities[13] to make such investments. These contributions will complement the Union contribution and will at least match the Union contribution.

Contributions by the Partners other than the Union [14] [15] [16] will take the form of:

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[10] The maximum Union contribution may be increased in duly justified cases (e.g. with contributions to Horizon Europe from third countries if available) and when agreed by the Partners and matched by contributions from the Partners other than the Union.

[11] The undertaking and contribution by the Association covers only the in-kind contributions to be provided by its constituent entities and their affiliated entities (and not any contributions to be provided by its non-constituent entities or by a non-affiliated entity).

[12] The longer timeline for contributions from Partners other than the Union takes into account the fact that the contributions will materialise over a longer period.

[13] Entities are affiliated when they have a link with the beneficiary, in particular a legal or capital link, which is neither limited to the action nor established for the sole purpose of its implementation, in accordance with Article 187(1) of the Regulation (EU, Euratom) 2018/1046 of the European Parliament and of the Council of 18 July 2018 on the financial rules applicable to the general budget of the Union.

[14] In line with Annex III of Horizon Europe and referred as co-investment in Annex V of Horizon Europe.

[15] Where applicable, funding from state resources must be compliant with State aid rules.

[16] The European Partnership may consider the 'Do No Significant Harm Principle' pursuant to Article 17 of Regulation (EU) 2020/852 and take into account the provisions of that Regulation to improve access to sustainable finance, where relevant.

a) **In-kind contributions to the Actions funded by the Union**, consisting of eligible costs in accordance with the Horizon Europe rules minus the Union contribution;
b) **In-kind contributions to Additional Activities** that are in the scope of the Strategic Research and Innovation Agenda (SRIA) and addressed in the annual Additional Activities Plan, which is approved by the Partnership Board. In-kind Additional activities are those activities which contribute to achieving the objectives of the Co-programmed European Partnership, including R&I at higher Technology Readiness Level (TRL) and/or to ensure demonstration, market, regulatory and societal uptake, which are in the scope of the SRIA but are not covered by Union funding.

For the in-kind contributions generated in Actions with lower funding rates than the maximum funding rates under Horizon Europe, the funding rate will be defined individually per call topic in the Horizon Europe Work Programme. This will range from the standard funding rate for R&I actions, to reduced funding rates for certain R&I actions and for Innovation actions in line with [Article 34] of Horizon Europe. The selection of topics with reduced funding rates will be discussed in the Partnership Board.

In addition, the Partners other than the Union intend to make **Investments in operational activities** that go beyond the work foreseen in the SRIA, that contribute to achieving the objectives of the Co-programmed European Partnership and where there is a clear link between the investment and the activities of the Co-programmed European Partnership (e.g. investments in building production facilities, in training programmes for workers potentially upscaled thanks to the European Social Fund Plus (ESF+), and in other activities required for producing and putting on the market the product/service resulting from the R&I performed as part of the Co-programmed European Partnership). These Investments in operational activities are however not included in the abovementioned contributions intended by the Partners other than the Union but they should be taken into account as leverage.

3 Governance

The Partners should convene in the form of a Partnership Board as the main forum for dialogue and steering to reach the objectives set out in this Memorandum of Understanding. Through the Partnership Board, the representatives of the Partners should agree on all issues concerning the cooperation for the Co-programmed European Partnership. The Partners through their participating representatives are considered as 'Members' of the Partnership Board.

The Partners agree on the composition and size of the Partnership Board, while respecting the following principles:

- Adequate representation of the European Commission services, including through acting as co-chair when meeting in the format of the Partnership Board;
- Adequate representation of SMEs;
- Adequate gender balance;
- Adequate geographical coverage.

Participation in the Partnership Board may be on a rotating basis, except for the representatives of the European Commission.

In addition, the Partnership Board may agree to invite, or nominate as observers to its meetings representatives of Member States and Countries Associated to the Horizon Europe Framework Programme, representatives of other European Partnerships, civil society organisations, standardisation bodies, certification bodies, regulators, public procurers as well as experts in the area of the Co-programmed European Partnership.

The Partnership Board will be co-chaired by the European Commission, represented by the lead service in charge of the Co-programmed European Partnership, and a co-chair from the Partners other than the Union, selected among their members nominated to the Partnership Board.

The Partnership Board may lay down its Rules of Procedure, based on a harmonised proposal provided by the European Commission, covering inter alia rules on confidentiality, transparency and avoidance of conflicts of interests.

In order to address strategic issues, the Partners may also convene at a higher level[17] to review the work of the Partnership Board, take stock of the progress by the Co-programmed European Partnership in achieving its objectives, adjust priorities and activities according to changing market or policy needs or based on results from monitoring and evaluation activities, and discuss further ways to enhance collaboration between European Partnerships and synergies with other Programmes. The implementation of results and proposals from such high-level meetings may be subject to approval by the Partnership Board.

The Board of Stakeholders advises the Partnership Board on its actions and decisions. It will comprise experts and stakeholders from across Europe within the scope of the priorities of the Co-programmed European Partnership, including e.g. from academia, industry, SMEs and end-users.

The Partners other than the Union may establish a National and Regional Advisory Group, composed of relevant public authorities, for external strategic advice. This group may get involved and give advice to the various decision-making committees on the Photonics21 Work Group level, and to the Board of Stakeholders, the Core Programme Steering Board and the Partnership Board. Furthermore, the National and Regional Advisory Group may inform and advise the Photonics21 Board of Stakeholders and the Executive Board regarding political issues and objectives and governmental activities at regional, national and European level. Moreover, the National and Regional Advisory Group may take up recommendations developed by Photonics21 and support their implementation.

The National and Regional Advisory Group should advise and actively support the achievement of objectives of the Co-programmed European Partnership and ensure complementarity with national policies, priorities and programmes. They may review information and provide opinions

[17] For example, between the President of the Photonics21 Association and a Director-General from the European Commission.

on the progress of the Co-programmed European Partnership towards its scientific, economic and/or societal impacts.

The National and Regional Advisory Group may provide information to, and act as an interface with the Co-programmed European Partnership on the following matters:

a) The status of activities performed under national or regional policies, priorities and research and innovation programmes which are relevant to the Co-programmed European Partnership and identification of potential areas of cooperation, including concrete actions taken or envisaged for the deployment of relevant technologies and innovative solutions at the national or regional level;
b) Specific measures taken at national level or regional level to maximise the impacts of the results achieved, in particular dissemination events, dedicated technical workshops and communication activities;
c) Specific measures taken at national or regional level to support the exploitation, deployment and/or scale-up of the results achieved within the Co-programmed European Partnership.

The National and Regional Advisory Group may also make proposals to the Partnership Board on the above matters.

The Partnership Board convenes the meetings of the National and Regional Advisory Group.

The Partners other than the Union may arrange their own governance structures and implement the appropriate consultation processes, based on openness and transparency, to ensure the adequate involvement of all relevant stakeholders in the preparation of the inputs to the European Commission, providing that these do not contradict this Memorandum of Understanding. The European Commission services are invited to participate in all Photonics21 Work Group Meetings and might be also invited to participate in the Core Programme Steering Board meetings of the Partners other than the Union as an expert team on subjects related to topics that are relevant for the Co-programmed European Partnership. By the set-up of the Governance structure of the Partnership, external stakeholders representing the value chain expertise in the overall priority setting process are included with the formation of application-oriented work group teams, which *per se* include this expertise.

4 Activities and commitments of the European Commission

The European Commission undertakes to duly take into account the input and advice from the Partners other than the Union when identifying and defining call topics for research and innovation activities in the scope of and linked to the Co-programmed European Partnership for Photonics to be included in the Horizon Europe Work Programmes. For this purpose, the European Commission undertakes to consult and maintain a regular dialogue with the Partners other than the Union during the preparation of the Work Programmes. The call topics will be subject to Horizon Europe comitology procedures.

The European Commission may support and contribute to the regular monitoring of the Co-programmed European Partnership, including through its participation in the Partnership Board and in other activities, in line with the Horizon Europe monitoring provisions (Article 50). The European Commission shall also carry out in a timely manner the interim and final evaluation of the Co-programmed European Partnership feeding into Horizon Europe evaluations, as specified in Article 52 of Horizon Europe. These evaluations will inter alia be fed by a self-assessment provided by the Partners other than the Union on the achievement of objectives and how their commitments have been fulfilled and contributions made throughout the lifecycle of the Co-programmed European Partnership.

The evaluations will examine how the Co-programmed European Partnership fulfils its mission and objectives, cover all its activities and evaluate its European added value, effectiveness, efficiency, including its openness and transparency, the relevance of the activities pursued and their coherence and/or complementarity with relevant regional, national and Union policies, including synergies with other parts of Horizon Europe (such as missions[18], clusters or thematic/specific programmes). The evaluations will take into account the views of stakeholders, at both European and national level. The evaluations will include, where relevant, an assessment of the most effective policy intervention mode for any future action, as well as the relevance of any possible renewal of the Co-programmed European Partnership given the overall policy priorities and the research and innovation support landscape, including the coherence and positioning against other initiatives supported through the Framework Programme, in particular European Partnerships or missions.

5 Activities and commitments of the Partners other than the Union

5.1 Activities

The Partners other than the Union undertake to provide inputs and advice to the European Commission in order to achieve the objectives of the Co-programmed European Partnership. In particular, they may provide input and advice to the European Commission in order to contribute to the identification of priorities of research and innovation activities and the definition of call topics to be included in the Horizon Europe Work Programmes, in view of financial support for indirect actions following calls for proposals and contests. This is without prejudice to the outcome of the Horizon Europe comitology procedures.

The Partners other than the Union also undertake to make the following In-kind Additional Activities and Investments in operational activities in support of the objectives set out in Section 1 of this Memorandum of Understanding:

a) Scope of In-kind Additional Activities. In-kind Additional Activities may include[19]:

[18] Should missions be confirmed. Hereinafter, missions are mentioned under the condition that they are confirmed.
[19] For any further details please see the Annex as well as the relevant chapter in the Photonics Strategic Research and Innovation Agenda „New Horizon – Securing Europe's technological sovereignty through photonics", pages 149 – 155.

Activities (high level scoping exercise)	Area of Activity
a. Organize for an effective Photonics21 membership management under the light of broadening stakeholder basis	Broaden Stakeholder Basis / Commitment
b. Photonics21 work group workshops with members, 6 application work groups and 1 core photonics work group	Broaden Stakeholder Basis / Cross Cutting Activities / Community / Ecosystem
c. Joint workshops with external stakeholders such as other partnerships in relevant thematic areas	Broaden Stakeholder Basis / Cross Cutting Activities / Community / Ecosystem
d. Matchmaking activities such as the organisation of webinars and workshop to facilitate matchmaking	Broaden Stakeholder Basis / Cross Cutting Activities / Community / Ecosystem
e. Systematically coordinate / seek collaboration activities with other communities and partnerships	Broaden Stakeholder Basis / Cross Cutting Activities / Community / Ecosystem
f. Prepare strategic photonics technology enabled value chain roadmaps with strategic value chain partners	Broaden Stakeholder Basis / enlarge Strategic Value Chains / Knowledge Sharing / Ecosystem
g. Photonics-related and photonics value chain related webinars with various targets groups such as investors, researchers, end-users	Broaden Stakeholder Basis / enlarge Strategic Value Chains / Knowledge Sharing / Ecosystem
h. Prepare and distribute Photonics and Photonics related strategic Value Chains Investment papers	Financing Growth / Provide Risk Capital
i. Trigger co-investment (incl. Pilots and demonstrators) activities between EU member states and regions, incl. associated states	Foster Growth and Research Excellence / Research and Innovation
j. Facilitating access to growth financing for photonics SMEs and Start-ups: Running dedicated photonics financing boot camps with the European Investment Bank	Foster SMEs and Entrepreneurship
k. Strengthen entrepreneurship in photonics and strategic value chain innovations by awards, Investment opportunities together with VCs, EIB, Business Angels and national agencies	Impact / Research Excellence / Research and Innovation

l. Collaboration with end-user communities on the various regional, national, European and international level to secure synergy, utilisation and deployment of future oriented EU photonics technologies in strategic value chains	Impact / Research Excellence / Research and Innovation
m. Collaboration with other Partnerships on research and innovation topics (alignment, synergies, etc.)	Impact / Research Excellence / Research and Innovation
n. Provide strategic value chain research and innovation priorities as input to Horizon Europe work programmes	Impact / Research Excellence / Research and Innovation
o. Provide input to research and innovation policies by each strategic value chains and A-WG workshops (ie. position papers)	Impact / Research Excellence / Research and Innovation
p. Fostering founding and promotion of utilizing European photonics pilot lines for strategic value chains	Impact / Time to Market / Strategic Value Chains
q. Promote access to (blended) innovation financing for photonics start-ups and SMEs – Establishing a strategic partnership with the European Innovation Council	Impact / Time to Market / Strategic Value Chains
r. Activity and Progress monitoring report of the Photonics Partnership - plus Mid-Term and final Report	Monitoring
s. Development and publication of global and European photonics market studies and Value chain analysis	Monitoring and Market update
t. Specific activities to support photonics start-ups such as a European photonics start-up radar and the support of the European Photonics Venture Forum	Monitoring and Market update
u. Raise the awareness for photonics as key enabling technology for its strategic value chains and ensure the skills supply in Europe, create a networking platform for sharing best practice on educational and training material and educational courses for school children in photonics	Research Excellence / Education and Life-long learning

v. Engage with regional authorities to trigger cross regional / national photonics and Photonics strategic value chain related investment initiatives and networks	Strategic Value Chains / Cross Cutting Budgeting and Commitment
w. Cooperation activities to align with national, regional and photonics/ Photonics strategic value chain related roadmaps	Strategic Value Chains / Cross Cutting Budgeting and Commitment
x. Consultations with partners and other program to prepare for 2-page terms sheets for MoU	Strategy development and Government
y. Work Group Meetings (A-WGs and Core WGs) Coordinate and steer Horizon Europe photonics partnership projects	Strategy development and Government
z. Core Programme Steering Board Meetings to coordinate cross cutting and synergy using strategic value chain activities	Strategy development and Government
aa. Association Board / Partnership Board Meetings	Strategy development and Government
bb. Executive Board Meetings	Strategy development and Government
cc. Board of Stakeholder and Executive Board meetings	Strategy development and Government
dd. General Assembly meetings	Strategy development and Government
ee. Develop a European Photonics Communication Strategy / (definition, implementation and updates) in close cooperation with strategic value chain partners	Visibility / Communication / Community / Ecosystem
ff. Regular update the photonics communication channels (such as website, social media, newsletter, etc)	Visibility / Communication / Community / Ecosystem
gg. Generate interesting European Photonics PPP related and funded project news releases for b2b and corporate messages	Visibility / Communication / Community / Ecosystem
hh. Develop and conduct European photonics events in the form of online meetings, hybrid events or	Visibility / Communication / Community / Ecosystem

physical events when the overall situations allows	
ii. Develop and foster National/local photonics communication activities by project partners such as the organisation of thematic Photonics4 end-user workshops	Visibility / Communication / Community / Ecosystem
jj. Organisation of Photonics Partnership specific events such as the Photonics PPP Annual Meeting, webinars, etc.	Visibility / Communication / Community / Ecosystem

b) Scope of Investments in operational activities. Investments in operational activities may include*:*

i. Facilitate access to financial resources for European photonics companies in different phases of their development;
ii. Create access to venture capital for photonics start-ups and entrepreneurs by holding the annual "European Photonics Venture Forum";
iii. Continuously monitor photonics start-ups in Europe, advise them of financing opportunities and actively promote their participation in investment events;
iv. Cooperate with the European Investment Bank (EIB) to get access to capital for SMEs in the later growth phase, generate potential "leads" for the EIB to invest in photonics through workshops and webinars;
v. Trigger new joint cross Member State calls in photonics and to enable a close alignment with the Horizon Europe Photonics Partnership investments and an efficient preparation and coordination of new joint calls;
vi. Trigger well aligned cross-regional investments into a Europe-wide photonics infrastructure network where (non-photonics) SMEs can develop and test their digital photonics product ideas and produce prototypes and small series.

The planning and reporting of In-kind Additional Activities and Investments in operational activities will respect confidentiality requirements.

5.2 Openness and transparency

An appropriate level of openness is necessary to achieve the objectives of the Co-programmed European Partnership. Thus, the Partners other than the Union undertake to put in place measures that ensure:

a) An open and transparent process for consulting their constituent entities, their affiliates[20] and other relevant stakeholders as well as Member States and Associated Countries on the identification of the priorities of the Co-programmed European Partnership and the design of its activities, which results in an appropriate involvement of all relevant stakeholders;
b) A governance structure that results in a high level of openness and transparency, including publishing information on the functioning of the Co-programmed European Partnership (composition of partnership structures, decisions made by the Partnership Board etc.);
c) A growing participation in and contribution to the Co-programmed European Partnership, supported by an open policy to membership in the Association and an appropriate level of information and, if necessary, assistance to all constituent entities of the Partners other than the Union.

In particular, the Partners other than the Union undertake to ensure that the In-kind Additional Activities that they contribute are, to the extent possible, open for participation to non-members of the Co-programmed European Partnership (e.g. dissemination, and exploitation activities, etc.) and based on equal treatment.

Also, the Partners other than the Union undertake to put in place appropriate measures for informing SMEs, civil society and other relevant stakeholders about the Co-programmed European Partnership and promoting their participation.

5.3 Dissemination and communication

The Partners undertake to communicate and disseminate their activities and results broadly and through various channels, in order to ensure that any necessary information in the area of the Co-programmed European Partnership is available to all possible stakeholders, all along its duration. The Partners undertake to engage in information, communication, publicity and dissemination and exploitation activities of the Co-programmed European Partnership by applying mutatis mutandis Article 51 of Horizon Europe.

This communication and dissemination will also ensure that the EU support to the Co-programmed European Partnership is visible.

5.4 Coherence and coordination with other European Partnerships and beyond

The Partners undertake to set up and maintain a clear strategy/ and plan for the interfaces and joint activities of the Co-programmed European Partnership with the other relevant European Partnerships, as well as with the broader European research and innovation system and communities.

[20] Especially the ETP Photonics21 members.

The Partners other than the Union will establish a formal and regular collaboration with the following other European Partnerships:

a) European Partnership Key Digital Technologies;
b) European Partnership Made in Europe;
c) European Partnership for Artificial Intelligence, Data & Robotics;
d) European Partnership for Connected, Cooperative and Automated Mobility.

Further collaborations with other thematic related partnerships and initiatives will be considered and tested for feasibility and mutual interest in the course of the partnership[21].

The SRIA sets out further details, as appropriate, on coherence and collaboration with other European Partnerships, synergies with other Union programmes, Union bodies and national, international, and intergovernmental programmes and policies, and the relevant parts of Horizon Europe (including missions).

The Partners other than the Union may furthermore establish a formal and regular collaboration with other relevant research and innovation initiatives to secure an optimum level of interconnections and ensure effective synergies, inter alia to overcome potential implementation barriers at national level and to increase cost-effectiveness. Priorities for collaboration are the following other initiatives and/or missions:

a) The Quantum Flagship.

The Partners other than the Union will report specifically on their collaboration with other European Partnerships and initiatives in their annual reporting.

5.5 Fulfilment of commitments

The Partners other than the Union undertake to put in place measures that ensure that the contributions agreed are provided in full, and on time.

The Partnership Board may monitor, throughout the life of the Co-programmed European Partnership, the contributions reported by the Partners.

If the contribution by the Partners other than the Union is significantly lower than the overall estimation agreed in the Annual Additional Activities Plan, the Partnership Board may make recommendations to the Partners other than the Union on adjustment measures.

If the action taken is not sufficient to reach the contribution originally agreed, the Partnership Board may recommend the European Commission to adjust its own contribution to match the contribution *de facto* made by the Partners other than the Union.

[21] E.g. such as the European Partnerships Innovative Health Initiative, Smart Networks and Services, for Globally Competitive Space Systems, and for High Performance Computing.

6 Monitoring and reporting

The activities of the Co-programmed European Partnership will be subject to continuous monitoring and periodic reporting in accordance with Article 50, Annex III and Annex V of Horizon Europe. The outcomes of monitoring and reporting will feed into the evaluations of the Co-Programmed European Partnerships as part of Horizon Europe evaluations. It will feed into the biennial monitoring of the European partnerships in the context of the Strategic Coordinating Process.

The continuous monitoring and periodic reporting by the Partners will be carried out at least annually for the duration of the Memorandum of Understanding. There will be a simplified reporting over one year and a full reporting every second year.

The full reporting, every second year, should cover all points listed below (a-e). The simplified reporting, every one year, should focus on elements where data can be extracted from the Commission or other databases, for points a to c.

The periodic reporting from Partners other than the Union will include:

a) The progress of the Co-programmed European Partnership towards its objectives (based on the Key Performance Indicators (KPI)) and the expected scientific, economic and societal impacts (following the Horizon Europe Key Impact Pathways). This reporting should also contain a qualitative assessment of the KPI for the past year.
b) Information on the functioning of the Co-programmed European Partnership, including on openness, transparency, collaboration and synergies with other European Partnerships and initiatives, etc. in line with the implementation criteria for European Partnerships.
c) Agreed and actually provided contributions.
d) Investments in operational activities undertaken by the Partners other than the Union, and leverage including additional public and private investment mobilised to exploit or scale-up partnership results.
e) Structured and representative "impact case studies"[22] that will be used to highlight lessons learned from specific projects/activities, their drivers and barriers to impact, and their possible follow-up with the appropriate instruments, including other forms of support outside the Co-programmed European Partnership, such as training and skills development.

The monitoring and reporting will be done on the basis of evidence provided by Partners respecting confidentiality of information and avoiding anti-competitive behaviour. To the extent possible, Partners will provide monitoring data in close to real-time following Horizon Europe, in particular management and implementation data. To the extent possible, the indicators and methodologies used to monitor the progress of the Partnership towards its objectives and scientific, economic and societal impacts should be harmonised and aligned with the monitoring framework of Horizon Europe (Key Impact Pathways), and the monitoring criteria of European Partnerships.

[22] i.e. high potential project outcomes that can be fast-tracked towards further investment and rapid development.

With due regard to their respective competencies, institutional settings and operational frameworks, the Partners may regularly inform and consult each other on the results of the monitoring, including to assess the contributions of the In-kind Additional Activities and Investments in operational activities undertaken by the Partners other than the Union.

The monitoring and reporting should allow for an assessment over time of their results and progress towards impacts, their visibility and positioning in the international context, and potential needs for adjustment measures.

Upon request, the Partners other than the Union engage to provide the European Commission with additional necessary information for the assessment of the achievements of the Co-programmed European Partnership in the context of the overall Horizon Europe evaluation, respecting confidentiality of information, and in the context of the Strategic Coordinating Process for European Partnerships (e.g. input to the biennial monitoring of the European Partnerships).

6.1 General systems

The Partners undertake to set up and implement an effective reporting and monitoring system that allows the Co-programmed European Partnership as well as the European Commission to track progress over time towards the stated objectives and impacts, as well as to provide implementation and management data.

The information provided should include, among others:

a) Detailed information on the calls for proposals in the Horizon Europe Work Programme, the proposals received, the grants resulting from these calls, the beneficiaries and participants, the results achieved by individual projects and their overall progress towards impact, or any other information deemed necessary for developing, implementing, monitoring and evaluating Union policies or programmes. Such access to information is limited to non-commercial and non-competitive use and will comply with applicable confidentiality rules. The primary means of collecting information will be through European Commission's reporting systems for management of the Horizon Europe programme;
b) Activities and fulfilment of contributions by the Partners other than the Union, progress towards objectives, deliverables and KPIs, visibility and positioning in the international context, the results, impacts and leverage. The primary means of collecting information on will be through annual and biennial[23] reporting by the Partners other than the Union and through European Commission's reporting systems for management of the Horizon Europe programme. Information collection will be based on a common methodology as specified by the Commission services in consultation with the Partners other than the Union.

[23] i.e. once every two years.

6.2 Reporting method for In-Kind Contributions to Additional Activities and Leverage

There are three categories related to contributions and activities that Partners other than the Union will be reporting on:

a) In-kind contributions to the Actions funded by the Union[24]. At the level of the projects, reporting will be done continuously through European Commission's reporting systems for management of the Horizon Europe programme;
b) In-kind contributions to the additional activities, foreseen in the Additional Activities Plan. At the level of the partnership, reporting will be done annually by the Partners other than the Union and continuously through European Commission's reporting systems for management of the Horizon Europe programme[25];
c) Investments in operational activities foreseen beyond the SRIA, and leverage including other investment mobilised to exploit or scale-up partnership results. At the level of the partnership, reporting will be done biennially[26] by the Partners other than the Union and continuously through European Commission's reporting systems for management of the Horizon Europe programme[27].

The value of the in-kind contributions reported by the Partners other than the Union will be calculated on the basis of a common methodology in line with Annex V of Horizon Europe. The Partners may keep an anonymised record of these contributions from its constituent entities and affiliated entities, which provides the basis for periodic reporting of the total value by the Partners other than the Union of in-kind contributions to the partnership's activities.

6.3 Key Performance Indicators (KPIs)

The following Key Performance Indicators are defined for the Co-programmed European Partnership and will be included in monitoring and reporting. The Key Performance Indicators are outlined in detail in the Annex "Table Key Performance Indicators."[28]

1. Photonics Industry growth versus global / European GDP growth
   - On a global level

[24] Contributions from beneficiaries that are not members or affiliates of the partners other than the Union cannot be considered as a contribution from partners, but these will be considered as part of quantitative leverage effect.
[25] For example, project reporting will include fields about 'Further investment mobilised to exploit or scale-up project' that could be used for the partnership-level reporting.
[26] i.e. once every two years.
[27] For example, project reporting will include fields about 'Further investment mobilised to exploit or scale-up project' that could be used for the partnership-level reporting.
[28] Please refer to the Annex related to Section 6.3.

- On an EU level

2. Maintain / Increase the (European) market/production share
   - of the global photonics market in total
   - and specifically market share in the "Core" EU segments

3. R+I Spending
   - Innovation spending quote as % of sales
   - Number of Patents
   - GERD Innovation Radar

4. Next Generation Skill sets
   - Education, Training, life long-learning, attracting young people - new curricula in main areas - academic and non-academic
   - Digi Hubs / cross cutting and collaborative institutions

5. Number and Structure of SMEs in EU Industry
   Financing SMEs - providing Risk Capital

6. Analysis of Strategic Value Chains where Photonics plays a role
   - Increase of cooperation along TRL
   - Increased collaboration along value chains / integrated collaborative approach
   - new deployment of Photonics Technologies in end-user systems and applications

7. Innovation Level of EU SMEs (specifics in Deep Tech)
   Participation of SMEs Horizon Europe Programme
   Participation and Financing SMEs in EIC/EIB programs
   Cross cutting SME participation in Digi-Hubs

8. Increased Industry participation

9. Participation of SMEs in Photonics Partnership projects (% of participants and % of grants)
   Participation of SMEs participating in EIC and EIB Financing

10. Ability to attract other Stakeholders and form Partnerships with other Co-programmed Partnerships/ Institutions - # of Stakeholders
    Number of SRIAs demonstrating collaboration along value chains and with other programs

11. Leverage Study on 4 levels of leverage as defined in EU Commission for Co-programmed Partnerships Monitoring

12. Project contribution to future Growth
    - Plans for R+I investments within 3 years to come 5,
    - Plans for increase employment within 3 years to come

13. Open Access for other Stakeholders
    Making the EU Projects and their impact more visible to the broader public

14. Fostering Collaboration of the Research and Development Ecosystem across Europe
    Involve broad variety of Countries in Stakeholder Basis / Secure Best Practice Exchange

15. Number of new Pilot Lines
    Number of new Demonstrators

The SRIA sets out further details, as appropriate, on the monitoring framework for the Co-programmed European Partnership.

7 Application of this Memorandum of Understanding

Any issues related to the interpretation and implementation of this Memorandum of Understanding may be decided upon in consultation by the Partners in the Partnership Board. In case of ultimate disagreement, any of the Partners may request an early end of the Memorandum of Understanding.

Adaptations to this Memorandum of Understanding may be requested by any of the Partners by registered letter.

8 Duration and Review

The starting date for the Partnership is [*insert date of signature*] and its end date is 31.12.2030. The last calls for proposals can be launched up until 31.12.2027, so the last three years of the partnership should be used to conclude remaining activities.

Any of the Partners may communicate by a registered letter at any time the motivated intention to end this Memorandum of Understanding. In the absence of renewal, appropriate measures may be taken to ensure phasing-out of Framework Programme funding according to the conditions and timeline agreed with the Partners ex-ante, without prejudice to possible continued transnational funding by national or other Union programmes, and without prejudice to private investment and on-going projects. This phasing-out plan may be prepared by the Partnership Board before the interim evaluation of Horizon Europe.

The periodic monitoring and reporting will inform the interim and final evaluations of Horizon Europe evaluations referred to in Article 52 of Horizon Europe. The evaluations will be taken into consideration in the phasing out or possible renewal of the partnership.

On the basis of these reviews and the evaluations, any of the Partners may propose adaptations to this Memorandum of Understanding or decide for it to be ended.

Done in duplicate at … on XX.XX.202X,

FOR THE EUROPEAN COMMISSION	FOR THE PHOTONICS21 ASSOCIATION

Annexes:

Ad 5.1. In-Kind Additional Activities

Overview graphic as outlined in the Photonics Strategic Research Agenda

Area of Activity / Investment Area	Activities (high level scoping exercise)	2021		2022		2023		2024		2025		2026		2027	
		HY	HY	HY	HY	HY	HY	HY	HY	HY	HY	HY	HY	HY	HY
Broaden Stakeholder Basis / Committment	Organize for an effective Photonics21 membership management under the light of broadening stakeholder basis														
Broaden Stakeholder Basis / Cross Cutting Activities / Community / Ecosystem	Photonics21 work group workshops with members, 6 application work groups and 1 core photonics work group														
Broaden Stakeholder Basis / Cross Cutting Activities / Community / Ecosystem	Joint workshops with external stakeholders such as other partnerships in relevant thematic areas														
Broaden Stakeholder Basis / Cross Cutting Activities / Community / Ecosystem	Matchmaking activities such as the organisation of webinars and workshop to facilitate matchmaking														
Broaden Stakeholder Basis / Cross Cutting Activities / Community / Ecosystem	Systematically coordinate / seek collaboration activities with other communities and partnerships														
Broaden Stakeholder Basis / enlarge Strategic Value Chains / Knowledge Sharing / Ecosystem	Prepare strategic photonics technology enabled value chain road-maps with strategic value chain partners														
Broaden Stakeholder Basis / enlarge Strategic Value Chains / Knowledge Sharing / Ecosystem	Photonics-related and photonics value chain related webinars with various targets groups such as investors, researchers, end-users														
Financing Growth / Provide Risk Capital	Prepare and distribute Photonics and Photonics related strategic value chains investment papers	X						X				X			
Foster Growth and Research Excellence / Research and Innovation	Trigger co-investment (incl. pilots and demonstrators) activities between EU member states and regions incl. associated states														
Foster SMEs and Entrepreneurship	Facilitating access to growth financing for photonics SMEs and Start-ups: Running dedicated photonics financing boot camps with the European Investment Bank														
Impact / Research Excellence / Research and Innovation	Strengthen entrepreneurship in photonics and strategic value chain innovations by awards, investment opportunities together with VCs, EIB, Business Angels and national agencies														
Impact / Research Excellence / Research and Innovation	Collaboration with end-user communities on the various regional,national, European and international level to secure synergy utilization and deployment of future oriented EU photonics technologies in strategic value chains														
Impact / Research Excellence / Research and Innovation	Collaboration with other Partnerships on research and innovation topics (alignment, synergies, etc)														
Impact / Research Excellence / Research and Innovation	Provide strategic value chain research and innovation priorities as input to Horizon Europe work programmes														
Impact / Research Excellence / Research and Innovation	Provide input to research and innovation policies by each strategic value chain and application work group (ie. position papers)														
Impact / Time to Market / Strategic Value Chains	Fostering founding and promotion of utilizing European photonics pilot lines for strategic value chains														
Impact / Time to Market / Strategic Value Chains	Promote access to (blended) innovation financing for photonics start-ups and SMEs – Establishing a strategic partnership with the European Innovation Council														

Area of Activity / Investment Area	Activities (high level scoping exercise)	2021		2022		2023		2024		2025		2026		2027	
		HY	HY	HY	HY	HY	HY	HY	HY	HY	HY	HY	HY	HY	HY
Monitoring	Activity and Progress monitoring report of the Photonics Partnership – plus mid-term and final report	X		X		X		XX	XX	X		X		XX	XX
Monitoring and Market update	Development and publication of global and European photonics market studies and value chain analysis	X						X							X
Monitoring and Market update	Specific activities to support photonics start-ups such as a European photonics start-up radar and the support of the European Photonics Venture Forum														
Research Excellence / Education and Life-long learning	Raise the awareness for photonics as key enabling technology for its strategic value chains and ensure the skills supply in Europe, create a networking platform for sharing best practice on educational and training material and educational courses for school children in photonics														
Strategic Value Chains / Cross Cutting Budgeting and Committment	Engage with regional authorities to trigger cross regional / national photonics and photonics strategic value chain related investment initiatives and networks														
Strategic Value Chains / Cross Cutting Budgeting and Committment	Cooperation activities to align with national, regional and photonics/photonics strategic value chain related roadmaps														
Strategy development and Goverment	Consultations with partners and other programs to prepare for 2-page terms sheets for MoU														
Strategy development and Goverment	Work Group Meetings (A-WGs and Core WGs): Coordinate and steer Horizon Europe photonics partnership projects	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Strategy development and Goverment	Core Programme Steering Board Meetings to coordinate cross cutting and synergy using strategic value chain activities		X		X		X		X		X		X		X
Strategy development and Goverment	Association Board / Partnership Board Meetings	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Strategy development and Goverment	Executive Board Meetings	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Strategy development and Goverment	Board of Stakeholder and Executive Board meetings	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Strategy development and Goverment	General Assembly meetings	X		X		X		X		X		X		X	
Visibility / Communication / Community / Ecosystem	Develop a European Photonics Communication Strategy / (definition, implementation and updates) in close cooperation with strategic value chain partners														
Visibility / Communication / Community / Ecosystem	Regular update the photonics communication channels (such as website, social media, newsletter, etc.)														
Visibility / Communication / Community / Ecosystem	Generate interesting European Photonics Partnership related and funded project news releases for b2b and corporate messages														
Visibility / Communication / Community / Ecosystem	Develop and conduct European photonics events in the form of online meetings, hybrid events or physical events when the overall situations allows														
Visibility / Communication / Community / Ecosystem	Develop and foster National/local photonics communication activities by project partners such as the organisation of thematic Photonics4 end-user workshops														
Visibility / Communication / Community / Ecosystem	Organisation of Photonics Partnership specific events such as the Photonics Partnership Annual Meeting, webinars, etc.														

Text version which outlines the bullet points of section 5.1

a) Scope of In-kind Additional Activities. In-kind Additional Activities may include*:*

1. For Europe's key industries to remain competitive in the global marketplace, they need to upgrade their products and services with digital technologies like photonics much faster than in the past. The European Partnership for Photonics will seek access to these end user industry communities and jointly develop “photonics enabled” industry strategies and roadmaps. In contrast to the "core photonics technology platform roadmaps" (technology push), the end user roadmaps will follow the needs of end user markets and societal challenges (market pull). This fundamental new approach will lead to the establishment of new strategic value chains between Photonics and end user industries in Europe that will guarantee Europe’s sovereignty in the development and manufacturing of strategically relevant digital products. Cooperation agreements with end user community stakeholder associations are currently in preparation. Roadmaps may cover topics like Photonics4 Medical Diagnostics, Photonics4 Digital Manufacturing, Photonics4 Space, Photonics4 Smart Green Farming etc... The “photonics enabled” end-user industry technology roadmaps will cover closer to the market Technology Readiness Levels from 5-8. In addition, the European Partnership for Photonics will launch a series of workshops at regional level called "Photonics4 - …" addressing different regionally relevant end user sectors. These workshops will bring together photonics technology providers and end-user companies to trigger concrete business to business or research to business collaborations on a short-term basis.

2. The European Partnership for Photonics may establish and will cooperate with the National and Regional Advisory Group consisting of relevant public authorities for preparing joint calls between Member States and associated states as well as on regional level. It will make sure that the Member State representation in the National and Regional advisory group will grow from currently 7 to 12 Member States and that joint calls with a funding volume of at least 10 million Europe will be initiated. In addition, the partnership will create a platform for photonics regions to network, discuss and agree on joint cross-regional investment projects. Photonics21 will also serve as a secretariat for the regions, i.e. regional ministries, to prepare for joint activities and make the link to the European Photonics Partnership. This way, dedicated funding activities by the Co-programmed European Partnership (e.g. pilot lines) can be closely coordinated with the regions. Furthermore, Photonics21 will promote the "EU Interregional Innovation Investment Instrument" (currently prepared as part of the next multiannual financial framework 2021-27) to the regional authorities to start joint activities. A “Thematic Photonics Platform” has already been established under the Smart Specialisation Platform of the EU Commission[29], in which 17 regions are participating.

3. In terms of communication the partnership will establish the central communication platform and switchboard on Photonics Research and Innovation in Europe. This includes the broad communication about Horizon Europe Photonics Partnership project achievements towards end-user industry as well as photonic related stories in opinion forming media. Towards the photonics community the partnership will provide all information about the strategy development approach, processes, decision making to ensure a broad, open and transparent strategy development and implementation process via the website, regular newsletters, twitter and LinkedIn. Furthermore, information about financing opportunities provided by the European

[29] https://s3platform.jrc.ec.europa.eu/photonics

Investment Bank and the European Photonics Venture Forum and entrepreneurship contests will be circulated to the community via newsletter, webinars and workshops. In order to increase the deployment of photonics in end-user industry and to start new collaboration the partnership will provide a central public relations service to the Horizon Europe Photonics Partnership projects, helping them to communicate about the impact of the projects to the end-user industry and the general public. In coordination with the project coordinator and the Photonics unit of the European Commission, the partnership will issue press releases, contact media and follow up on press coverage. The focus will be on those projects that have the highest impact and offer the highest chances of success to be taken up by end-user trade media or international media. Articles about successful photonics projects have been published by the project and featured in top class international media such as "BBC" and others. Finally, the partnership will educate and advocate for photonics and the way it contributes to solve societal challenges like tackling the Green Deal, digitising European industry or safe food from farm to fork towards the political level with a focus on the European Parliament and Member State national authorities. A specific communication action will be started towards venture capital investors by issuing and distributing "Photonics Investment Reports" on major markets like Smart Farming, Industry 4.0 or alike to promote the area as a high value investment area. All information will be widely communicated as soon as they are available right from the start of the project to the respective target groups.

4. For a comprehensive industrial strategy, the skill shortage needs to be addressed, as the competition for talent is especially fierce in high-growth technology sectors, such as photonics. In order to raise the awareness for photonics as a key enabling technology for innovation across diverse application areas, and to support the skills supply in Europe, the partnership will create a networking platform for sharing best practice on educational and training material as well as educational courses for school children in photonics. The platform will leverage the extensive materials and activities that exist today across the consortium and our partners, and will address the one missing activity, the sharing of best practice and knowledge. This will have two elements, firstly the sharing of materials that are created across European and national projects, to ensure that there is a continuous evolution of these materials. At the same time, the network of outreach officers will discuss best practice for the accessibility of the material on the platform. These will be published on a website, along with their associated materials, such as feedback forms, in a categorised structure to make the material easily accessible. Secondly, the partnership will build a network for individuals who co-ordinate photonics focused outreach activities across Europe, and organise five webinars/workshops where they can share best practice and training for those who wish to participate in outreach, and co-ordinate cross-European activities such as the International Day of Light. This group will also provide inputs to the materials catalogue and feedback on the accessibility of website and helps hereby to develop the training.

b) Scope of Investments in operational activities. Investments in operational activities may include:

1. Even before the Covid-19 pandemic, access to venture and growth capital for innovative photonics deep tech companies in Europe was a major obstacle for photonics companies. This situation is expected to worsen massively in the coming years due to the economic impact of the pandemic. Therefore, the partnership will facilitate access to financial resources for European photonics companies in the different phases of their development. The partnership creates impact in the different stages of the start-up development cycle. First, entrepreneurs or start-ups that are just about to get started (e.g. those emerging from the Photonics Partnership projects) will be targeted and encouraged to participate in the newly established activities of the European

Innovation Council in order to further develop the technology and the business case and secure their growth through this new blended financing option.

2. In addition, access to venture capital for photonics start-ups and entrepreneurs will be created by holding the annual "European Photonics Venture Forum". This provides a nurturing ground for young companies and entrepreneurs and brings them into direct contact with VC and corporate VC investors. The partnership will continuously monitor photonics start-ups in Europe, advise them of financing opportunities and actively promote their participation in investment events.

3. Growth capital for more established photonics start-ups and SME: Access to capital for SMEs in the later growth phase is made possible by the cooperation with the European Investment Bank (EIB). In particular, the EIB's venture debt product seems to be particularly suitable for photonics companies, as shown by existing financing cases. The role of the Partner other than the Union will be to generate potential "leads" for the EIB to invest in Photonics. This will be done through workshops and webinars. However, of the approximately 100 venture debt investments of the European Investment Bank (EIB) over the last few years, only 7 have been made in photonic companies. Through joint events with the EIB, the Partnership will promote this financing opportunity much more actively than in the past.

4. The efficient coordination of photonics investment and public initiatives at European, national and regional level is a major challenge for Europe and has so far been insufficiently successful. In the face of massively increasing investments of competing economies like China, USA or South Korea, a better bundling of all resources is vital for Europe to remain competitive in this technology in the future. At Member State level, the partnership had already established a so-called Photonics21 Mirror Group, consisting of representatives of national ministries to coordinate national priorities and investments in photonics. As a result of this activity, five joint transnational photonics calls on different photonics subjects have been implemented under the ERANET co-fund and the EUREKA programme scheme. The partnership will now take this activity to the next level to trigger new joint cross Member State calls in photonics and to enable a close alignment with the Horizon Europe Photonics Partnership investments and an efficient preparation and coordination of new joint calls. The partnership will also encourage new countries, especially Central European countries like Poland, Lithuania, Slovakia and others, to join this group, as they are currently underrepresented. However, photonics innovation takes place at regional level, and Europe has world-renowned photonics regions such as North Brabant, Flanders, PACA, Mazovia, North Karelia, Thuringia and many others, which are currently not bundling their strengths in a complementary manner - often because the appropriate instruments or resources are lacking. The partnership will tackle this with the ultimate goal to trigger well aligned cross-regional investments into a Europe-wide photonics infrastructure network where (non-photonics) SMEs can develop and test their digital photonics product ideas and produce prototypes and small series. These will complement projects that will be launched by the Horizon Europe Photonics Partnership.

Ad 6.3. Key Performance Indicators (KPI)

Overview of Key Performance Indicators to be used for the Photonics Partnership

European Partnership Photonics		**Monitoring and evaluation framework**, draft 1, [16.09.2020]			
Overall vision: Photonics is a technology that is an essential building block for the digital transformation and for a green and healthy future in Europe. The new Photonic Partnership aims to speed up photonic innovations for a digital, green and healthy future in Europe, securing Europe's technological sovereignty, raising the competitiveness of Europe's economy and ensuring long-term job and prosperity creation. A holistic approach and strong links to applications are key elements.					
Objectives		**What is a measure of success?** Please use quantitative (Key Performance) and qualitative indicators, and link them to a point in time	**Which is the data source and methodology used** [project data, study, ….]	**Who is responsible for monitoring and providing the data / information** **When will it be collected?**	**Baseline and target**
General objectives (linked to impact indicators)	GO1 Fully exploit the **potential of photonics** for a digital, green and healthy future in Europe	1. Photonics Industry growth versus Global GDP growth (KPI) 2. Development of EU Photonics End-Use Industries -share of major mega markets in global economy -export rate development of major end-use industries (Monitor only)	Photonics Market Study (quantitative) Desktop Research from External Sources and Studies (ECFON, OECD, IWF, DB….)	Photonics21 Secretariat and Photonics PPP organization together with consultants 2 x in HE period	Baseline: 1,6x Target: 2x global GDP growth of EU Photonics industries
	GO2.1. **Securing Technological Sovereignty for Europe**	1. Value Chain Analysis of main photonics application areas 2. Success Stories (quantitative)	External Studies on important value chain in major markets (quantitative and qualitative)	Define critical areas: Photonics PPP with EU Commission Analysis: Photonics21 Secretariat and Photonics PPP organization together with consultants 2 x in HE period	Baseline: Was not monitored Target: Enhanced/closed loop in 3 main end-use areas by 2027

	GO 2.2. Contribution of Photonics Industry to **Digital Transformation**	1. Examples of Photonics enabled digital transformation in Critical industry Value Chains and applications 2. Examples of Photonics enabled Health and Consumer applications and processes (e.g. autonomous driving, Point of care diagnosis et al) 3. Examples of photonics enabled applications, processes for an enhanced secure and safe Digitization (e.g. Cyber Security, zero defect data collection, transport and analysis et. al.)	Qualitative: Success Stories / Desk Top Research/ Internal Surveys	Photonics21 Secretariat and Photonics PPP organization together with consultants 2 x in HE period EU Commission support with Project Partners	Baseline: Was not monitored Target: 1 example per A-WG
	GO3.1. Raise the **International Competitiveness** of Europe's economy and ensure ……	Maintain / Increase the (European) market/production share - of the global photonics market in total - and specifically market share in the "Core" EU segments	External Market Study	Photonics21 Secretariat and Photonics PPP organization together with consultants 2 x in HE period	Baseline: 15,4 % (with PV) and 17 % (wo PV) Target: Keep
	GO 3.2 (cont. **int. competitiveness**)	Innovation Power. R+I Spending - Innovation Spending quote as % of sales - Number of Patents - GERD Innovation Radar	External Market Study	Photonics21 Secretariat and Photonics PPP organization together with consultants 2 x in HE period	Baseline: ~ 10 % in R+I spending and 4 % in Capex Target: keep
	GO 3.3 **….and ensure Job and Prosperity**	1. Photonics EU Industry Employment Growth (KPI)	External Market Study	Photonics21 Secretariat and Photonics PPP organization	1. Baseline and Target: CAGR 1,6 % employment

	creation in Europe, not only for the photonics industry itself but also the up- and downstream enabled industries utilising photonics technologies.	2. Photonics EU Industry Employment Growth (Monitor only)	Desktop Analysis from External Sources and Studies (ECFON, OECD, IWF, DB….)	together with consultants 2x in HE period	growth in EU (wo PV) 2. Target: Half of global GDP Growth
Specific objectives* (linked to outcome/result indicators)	SO 1: **Integration of relevant stakeholders** representing downstream science and end-user industries as well as societal challenges	New Stakeholders in Membership base and at Workshops	Membership Database Analysis	Photonics21 Secretariat and Photonics PPP organization – yearly	Baseline: none Target: By 2022 new stakeholders account for 30% of the members of the Application Workgroups
	SO 2. By 2024 specific **joint research priorities are identified in the Application Workgroups** in the sense that R&I on a combination of photonics and other technologies are addressed	Availability of SRIAs in the Application Areas	SRIAs agreed and published	Photonics21 Secretariat and Photonics PPP organization in 2024	Baseline: Currently Zero Target: Min. 1 SRIA in each Application Area in 2024
	SO 3: By 2027 a significant number of **new R&I cooperation agreements**, that involve photonics	R+I Cooperation agreements	MoUs	Photonics21 Secretariat and Photonics PPP organization in 2024	Baseline: Currently Zero Target: at least 1 R+I cooperation Area per Work group (incl. 2 for Core WG)

	and application partners are established				
	SO 4: Foster SMEs and their innovation power	1. Number and Structure of SMEs in EU Industry 2. Participation of SMEs in Horizon Europe Projects / ERC	Market Study on number and structure of SMEs (age, start-up's and their sustainability) Survey amongst SMEs on VC sources and financing (Qualitative and Quantitative)	Photonics21 Secretariat and Photonics PPP organization together with consultants 2x in HE period EU surveys on SMEs / Analysis of EIB	Baseline: 5000 SMEs in Europe Target: Keep and grow them Participation Baseline: 28 % SME participation (participants) 24 % of Grants (Euro) Target: Keep at least
	SO 5: Boost **entrepreneurship** in the photonics sector	1. Secure availability of Risk Capital from private and public Sources 2. Support Search for such Investors Participation and Financing SMEs in EIC/EIB program	Success Stories Surveys amongst PPP project participants (Quantitative / Qualitative)	EIC / EIB EU Commission databases Photonics21 Secretariat and Photonics PPP organization	Baseline: 100 interested Investors / VC in Europe Target: Approach those 100 and potentially Increase Knowledge about Photonics
Operational objectives (linked to output indicators)	OO1.2.: Foster SMEs and their **innovation power** (cont.)	1. Secure availability of Risk Capital from private and public Sources 2. Support Search for such Investors 3. program	Success Stories Surveys amongst PPP project participants (Quantitative / Qualitative)	EIC / EIB EU Commission databases Photonics21 Secretariat and Photonics PPP organization	Baseline: 100 interested Investors / VC in Europe Target: Approach those 100 and potentially Increase Knowledge about Photonics
	OO2: **Digital Transformation** of the Photonics Industry	1. Applying Digital technologies (AI, IoT et al) in the Photonics Industry and Production 2. Analysis of Business Models / new Business Models	Survey amongst Photonics Industry and Desktop research (qualitative)	Photonics21 Secretariat and Photonics PPP organization together with consultants 2x in HE period	Baseline: was not monitored Target: Monitor
	OO3:	Photonics Technology relevant	Photonics PPP Project	EU Commission database	Baseline: 794 Projects in H

	Dissemination and **Deployment of Photonics Technologies**	for Horizon Europe Projects: - # of HE projects for which Photonics is relevant - Photonics Impact on end-user markets	Analysis and Horizon Europe Project Analysis	Photonics21 Secretariat and Photonics PPP organization together with consultants 2x in HE period	2020 where Photonics is relevant Target: Increase % of total HE projects where Photonics is relevant
	OO4 Innovation Power / **Time to market**	1. # of new Pilot Lines # of new Demonstrators 2. # of Spin-Offs 3. # of Patents applied linked to Projects 4. # of New systems and/or technologies developed in Projects	Survey amongst Project Partners	Photonics21 Secretariat and Photonics PPP organization with external consultants – supported by EU Commission – all 2 years	1. Target: 6 new Pilot Lines and/or Demonstrators (1 per WG) by 2027 2. Target: 9 % of P-PPP projects has led to a Spin-Off 3. Target: on average 1 per Project Partner 4. Target: on average 3 new systems/components developed
	OO5: **Future Growth and Investment perspectives**	Project contribution to future Growth - Plans for R+I investments within 3 years to come - Plans for increase employment within 3 years to come	Survey amongst Project Partners	Photonics21 Secretariat and Photonics PPP organization with external consultants – supported by EU Commission – all 2 years	Baseline: 48 % plan to invest within 3 years € 290 Mio. on average 25 % covered by grant 5000 Jobs from P-PPP in H 2020 Target: > 50 %
	OO6: **Next Generation Skill sets** - Education, Training, life long-learning, attracting young people	1. Set up collaborative Deep Tech Curricula in close cooperation with End Users 2. Install Digi Hubs across Europe for collaboration Seek Collaborations with Companies for Lifelong learning 3. Digital Skill Sets in EU companies, Schools and Universities	Survey amongst Community /HR representatives from companies / Universities / external evaluators	Photonics21 Secretariat and Photonics PPP organization supported by external consultants all 2 years	Baseline: no numbers monitored Target: # of Curricula with End Users - 1 per A-WG 3 collaborations with companies and universities and or programs