



**Photonics
For Advanced
Manufacturing**
By PIMAP Partnership

D1.3 Mapping of project and funding synergies for Photonics KETs and Industrial Applications



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1. Executive Summary

The PIMAP Partnership is a European project led by four clusters to support the adoption of photonics and microwaves technologies for the development of advanced manufacturing and related industrial applications. The project will provide a springboard for cluster SMEs to internationalise towards the United-States and Canada and support regional actions through the leverage of photonic technologies in Key Enabling Technologies. More specifically, the project will:

- Define the thematic areas and value chains for cross-sectoral collaboration between photonics and advanced manufacturing technologies
- Reinforce cross-fertilisation and inter-regional collaboration between clusters and SMEs
- Organise business missions to the United-States and Canada to test the PIMAP market positioning
- Build an internationalisation roadmap to unleash the export potential of European SMEs
- Support the constitution of sustainable European Strategic Partnership by the implementing a legal framework for the action plan

The PIMAP Partnership is implementing its action in coherence and synergy with the existing European initiatives to increase its impact for both the cluster organisations taking part to the project and their SMEs. Photonics and advanced manufacturing have been identified as priority areas by the European Commission to support Europe's industrial leadership, therefore leading to the creation of a structured ecosystem at the European, national and regional level. The following report consists in an overview of the synergies identified so far within the European ecosystem related to photonics and advanced manufacturing.

2. Introduction

In the framework of the implementation of the activities planned in the PIMAP Partnership, the project partners are conducting a mapping exercise to have a clear overview of the potential synergies with other relevant funding programmes and sector initiatives at the regional, national and European level.

The PIMAP Partnership is operating in photonics and advanced manufacturing, two priorities clearly identified by the European Commission for the modernisation of its industry and to enhance its competitiveness. In the era of the Industry 4.0, the challenges to boost the European Union growth and innovation capacity remain high. As photonics and advanced manufacturing are also part of the Key Enabling Technologies defined by the European Commission, a key element of the European industrial policy, it is essential to tackle the difficulty of translating its knowledge base into marketable goods and services¹.

The PIMAP Partnership will act as a springboard for its clusters and SMEs to innovate and internationalise towards the United-States and Canada. The success of the PIMAP Partnership is conditioned to its good integration within the existing European framework in order to maximise the impacts and benefits of the action.

The following mapping exercise presents the results of an analysis conducted in each partner ecosystem to identify potential synergies to exploit within the framework of the project. The linkages that will be developed with other initiatives at the regional, national and European level identified in this report will contribute to the sustainability of the partnership through a comprehensive approach.

¹ http://ec.europa.eu/growth/industry/policy/key-enabling-technologies_en

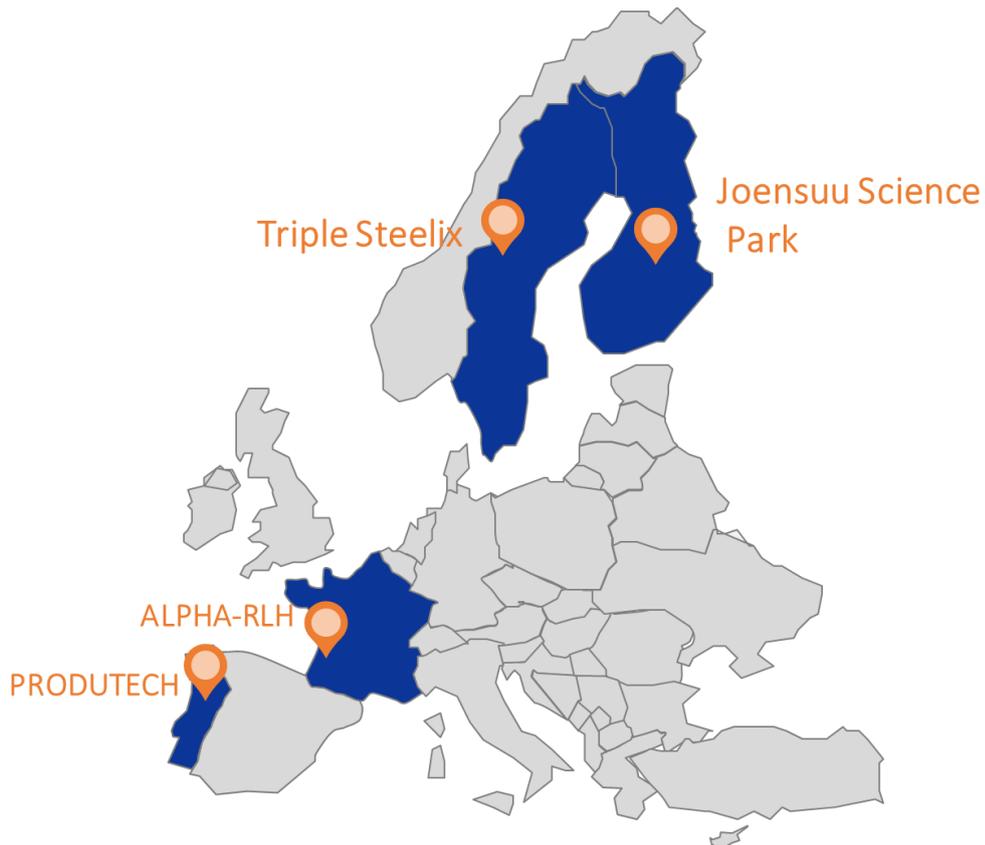
3. Regional strategies supporting the implementation of the action

Regions are key stakeholders for the implementation of the PIMAP Partnership project as they are actively involved in the definition policies supporting photonics and advanced manufacturing. The PIMAP Partnership consortium is composed of four partners, located in four different European regions:

- ALPHA- Route des Lasers et des Hyperfréquences (project coordinator), based in Nouvelle-Aquitaine, France
- TRIPLE STEELIX, based in Västmanland, Sweden
- Joensuu Science Park, based in North Karelia, Finland
- PRODUTECH, based in Norte, Portugal

The four regions covered by the PIMAP Partnership are very dynamic industrial regions actively involved in the shaping and implementation of policies supporting industrial modernisation.

The map below presents the geographical location of the four partners:



Localisation of the four PIMAP Partnership partners

3.1. Linkages between the PIMAP Partnership and the Regional Research and Innovation Strategies for Smart Specialisation (RIS3)

Regional Research and Innovation Strategies for Smart Specialisation have been set up to support investments on key national/regional priorities, challenges and needs for knowledge-based development, built on the strengths and potential for excellence in each region. The Regional Research and Innovation Strategies for Smart Specialisation aim at supporting the shift of regional economies towards high-added value activities and the uptake of innovative technologies to drive their growth and foster their innovation potential².

- The Nouvelle Aquitaine Region, represented in the consortium by ALPHA- Route des Lasers et des Hyperfréquences, identified lasers and photonics as priority sectors in its Smart Specialisation Strategy for industrial and research excellence as well as in its Regional Schema for economic development, innovation and internationalisation (SRDEII). The Nouvelle Aquitaine Region particularly supports the development of photonics and laser technologies, especially in the framework of industrial modernisation, through investments, political and economic support to innovative projects and the organisation of events.
- The North Karelia region, represented in the consortium by Joensuu Science Park identified technology and materials as a strategic sector for its economy, including photonics and mining. The region also actively supports manufacturing, mechanical engineering systems, in which precision technology, automation, various manufacturing methods, special components and composite materials are combined.
- The Västmanland region, represented in the consortium by TRIPLE STEELIX identified advanced manufacturing and complex systems as priority sectors in its Smart Specialisation Strategy. The region is strongly involved in the introduction of advanced manufacturing methods and other key enabling technologies which are relevant for industrial production, such as photonics applications. The development of high-performance steel, such as tool steel as well as the manufacturing of tools and components is a main priority of the region to modernise its industry and enhance its competitiveness.
- The Norte Region, represented in the consortium by PRODUTECH, identified advanced manufacturing technologies as a strategic sector for its economy, including Key Enabling Technologies notably Advanced Manufacturing Systems, nanotechnologies, materials and ICT. This priority is of high importance to support the shift of region towards the Industry 4.0.

The PIMAP Partnership will actively seek to generate synergies and new opportunities for photonics in advanced manufacturing in line with the research and innovation strategies implemented in each participating region. The partners will involve key regional stakeholders such as innovation agencies, chambers of commerce to mobilise their network and expertise in the project, especially for actions targeting SMEs. The alignment of the action of the PIMAP Partnership with the regional strategies will also maximise the impact of the project through greater visibility and political support.

² http://ec.europa.eu/regional_policy/sources/docgener/informat/2014/smart_specialisation_en.pdf

3.2. Synergies with the Smart Specialisation Thematic Platform on Industrial Modernisation and the Vanguard Initiative

The Smart Specialisation Platform for Industrial Modernisation was launched in June 2016 by the European Commission to foster interregional cooperation based on matching smart specialisation priorities, notably related to Key Enabling Technologies. The Smart Specialisation Platform for Industrial Modernisation aims to leverage opportunities in the regional strategic sectors and priorities of the regions involved through interregional cooperation, cluster participation and industry involvement. The cooperation between regions also allows scaling up towards larger impact and more effective collaboration along industrial value chains³.

Several thematic areas have been developed under the Smart Specialisation Platform for Industrial Modernisation, as a result of a strong cooperation between the Platform and the Vanguard Initiative. Two thematic areas are of high relevance for the PIMAP Partnership, namely:

- Photonics
- SME integration to Industry 4.0

The thematic area on photonics was founded in 2017 European Photonics Alliance, is an active network of European Digital Innovation Hubs and clusters. Joensuu Science Park took part to the design of the thematic area, as one the leading clusters in photonics operating in Finland. The Nouvelle Aquitaine Region is also one partnering region in the Alliance. The PIMAP Partnership will closely monitor the activities of the European Photonics Alliance, as well as the material they produce. The European Photonics Alliance notably plans to produce a mapping of competences and matching of business opportunities. This mapping includes a study of the photonics value chain, the identification of available innovation infrastructures and the exploration of complementarities between partners. The PIMAP Partnership will seek to develop synergies with the European Photonics Alliance according to the opportunities available and the progresses made by the project.

The thematic area on the SME integration to Industry 4.0 aims at increasing the industrial competitiveness across regions by raising awareness of SMEs and demonstrating them the benefits of Industry 4.0 solutions and technologies, with a particular focus on Key Enabling Technologies (KETs). The PIMAP Partnership will closely follow the activities of this thematic area as the involvement of SMEs in the project is a success factor for the implementation of its action.

PRODUTECH and the Norte Region are actively involved in the Vanguard Initiative as well as TRIPLE STEELIX and Dalarna Region. The Vanguard Initiative supports smart specialisation is driven by a political commitment made by regions to use their smart specialisation strategy to boost new growth through bottom-up entrepreneurial innovation and industrial renewal in European priority areas. PRODUTECH participates in two pilot projects: “high-performance production through 3D printing” and “efficient and sustainable manufacturing” and belongs to the steering board of both.

³ <http://s3platform.jrc.ec.europa.eu/industrial-modernisation>

4. COSME Programme

The COSME Programme is the European Programme for the Competitiveness of Enterprises and Small and Medium-sized Enterprises. The Programme is managed by the Executive Agency for Small and Medium-sized Enterprises on behalf of the European Commission. The COSME Programme supports the access to finance and markets for SMEs, entrepreneurship and the improvement of the business environment. Several projects supporting the reinforcement of the cluster ecosystem and SME internationalisation are currently funded under the COSME Programme, thus contributing to maximise the impact of the PIMAP project. In particular, the PIMAP Partnership will closely look at the synergies with the following support services, platforms and partnerships:

- The European Observatory for Clusters and Industrial Change
- The European Cluster Collaboration Platform (ECCP)
- The European Cluster Strategic Partnerships (ESCP-4i)
- The European Strategic Cluster Partnerships for Smart Specialisation Investments (ESCP-S3)

4.1. The European Observatory for Clusters and Industrial Change

The European Observatory for Clusters and Industrial Change supports service innovation but also key enabling technologies, digitalisation, creativity and eco-innovative, resource-efficient solutions as the key drivers of industrial change⁴. The European Observatory for Clusters and Industrial Change notably provides advisory support services to European Strategic Cluster Partnerships and promotes the development of world-class clusters with competitive industrial value chains that cut across sectors.

The European Observatory for Clusters and Industrial Change provides a broad range of services support European Strategic Cluster Partnerships to achieve their goals:

- Advisory support in the development of value chain mappings for internationalisation and value chain development, discussion on thematic fields
- Strategic information and tools for ESCP-4i (market/sectoral reports, recommendation of EU internationalisation services and initiatives)
- Organisation of webinars for inter-partnership learning (establishment and negotiation of international cooperation agreements; Strategies for SME engagement; Partnership building and intellectual property; Levering and combining public and private funding)
- Advisory support for ESCP-4i in the elaboration of sustainability business plans

The PIMAP Partnership has already established contact with the European Observatory for Clusters and Industrial Change and informed its representatives about what kind of services they would be interested in. The PIMAP Partnership expressed its interest for all of the services mentioned above, with a particular request on value chain development in photonics for advanced manufacturing and internationalisation towards the United-States and Canada. The PIMAP Partnership will keep in touch

⁴ <https://drive.google.com/file/d/1i2Ptmbt8xFYrKOH1nnWPCh8c3ahM09I6/view>

with the European Observatory for Clusters and Industrial Change and follow their upcoming activities which appear to be highly valuable to achieve the objectives of the project.

4.2. European Cluster Collaboration Platform

The European Cluster Collaboration Platform (ECCP) is an action of the Cluster Internationalisation Programme funded under the COSME Programme and launched by DG GROW (European Commission) in 2016. The ECCP gathers over 900 cluster organisations in Europe and beyond through a dynamic mapping. It is also a major information hub to learn about the latest news, events and open calls. The size of the ECCP community allows great opportunity to network and to create links with other cluster members. The ECCP is also animating the community on a regular basis by organising webinars and matchmaking events. The PIMAP Partnership will closely follow the events organised by the ECCP and take advantage of all actions targeting the United-States and Canada or having an interesting sectoral focus for the project. In particular, the ECCP is planning to organise an EU-Canada business mission in Spring 2019 and in which the PIMAP Partnership already expressed its interest in order to create linkages with local stakeholders and promote the activities led in the framework of the project. The ECCP also contains relevant information about international cooperation in strategic third-countries identified by the European Commission. The United-States and Canada have been selected as strategic third-countries and ECCP provides and gathers several interesting materials for the PIMAP Partnership, including notably information about the ongoing-policy dialog, market opportunities and key networks and stakeholders.

ECCP eventually offers a great visibility for the PIMAP Partnership and is the main communication channel of the project to disseminate its latest news and the outcomes of the activities conducted by the project.

4.3. European Cluster Strategic Partnerships (ESCP-4i)

The second generation of European Cluster Strategic Partnerships (ESCP-4i) was officially launched in February 2018 in Brussels by DG GROW (European Commission) and the Executive Agency for Small and Medium-sized enterprises (EASME) during a Partnering Event organised by the ECCP during the Second European Industry Day. 23 partnerships have been awarded the label of "European Strategic Cluster Partnership for Going International" by DG GROW, committing the ESCP-4i to work on a joint cooperation agenda with the aim to support the internationalisation of their SME members.

Among the 23 partnerships, 7 have identified the United-States as a strategic market for their activities and 5 have identified Canada as well. The table below summarises which partnership is operating in which sector and interested in which country as well as the possible synergies with the PIMAP Partnership.

Sectors / S3 priority area	Targeted markets relevant for the PIMAP Partnership	Possible synergies to exploit with the PIMAP Partnership
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LASER-GO GLOBAL	Lighting and Electrical Equipment / Photonics	Canada, United States	Exchanges of experience and good practices, joint participation to events related to photonics
European Digital Industry Alliance	Production Technology and Heavy Machinery / Advanced manufacturing systems	To be defined	Exchanges of good practices experience on the Industry 4.0, joint participation to events related to industrial modernisation
AdPack²	Paper and Packaging / Advanced Packaging	Canada, United States	Exchanges on the study visits planned in the United and Canada
EC2i	Environmental Services / Eco-innovations	United States	Exchanges on the matchmaking events organised in the United-States
ESCT Go Global	Information Technology and Analytical Instruments / Intelligent inter-modal & sustainable urban areas	United States	Exchanges on the study visits planned in the United-States
NF4	Food Processing and Manufacturing / Bio-pharmaceuticals	Canada, United States	Exchanges on the mission planned in Canada and the matchmaking event in the United-States
MobiGoIn-Action	Transportation and Logistics / Smart green & integrated transport systems	Canada, United States	Exchanges on their cooperation with ENRICH IN THE USA
GEO-ENERGY EUROPE	Electric Power Generation and Transmission / Power generation, renewable sources	Canada, United States	No potential joint activity has been identified so far
SPACE2IDGO	Information Technology and Analytical Instruments / Space	Canada	No potential joint activity has been identified so far
SpaceWave	Information Technology and Analytical Instruments / Space	Canada	No potential joint activity has been identified so far



- LASER-GO GLOBAL⁵



With a focus on Lighting and Electrical Equipment, Medical Technology, Biomedical Engineering but also on Photonics, this partnership aims to develop European cluster cooperation in the field of cross-sectoral health-photonics technology. Strong synergies with the PIMAP partnership have been identified as they share the same S3 EU priority area, photonics. LASER-GO GLOBAL has a clearly defined internationalisation strategy: the partnership attended to a Matchmaking Event in Tucson, USA (2018) and to the SPIE Photonics West conference in San Francisco (2018). LASER-GO GLOBAL is also planning innovation missions to Canada in 2018, but the location, the precise date and the focus of the mission are not yet defined.

The PIMAP Partnership will seek to develop combined actions and operations with LASER-GO GLOBAL, as both projects are operating in photonics and are highly interested in the Photonics West Conference. The PIMAP Partnership will establish contacts with LASER-GO GLOBAL to explore possibilities for joint actions towards the American or Canadian markets.

- European Digital Industry Alliance⁶



With a focus on Production Technology and Heavy Machinery Digital Systems and Representation, as well as Advanced manufacturing systems, the European Digital Industry Alliance is working on the internationalisation of digital technologies applied to manufacturing and industry. The PIMAP Partnership is highly interested in advanced manufacturing and the Industry 4.0, the partners will actively follow the activities led by the Digital Industry Strategic Partnership, as they are currently defining their targeted countries.

- AdPack²⁷



With a focus on Paper and Packaging, Food Packaging as well as Advanced materials, the purpose of this project is to foster cross-sectoral cooperation between the European clusters in the partnership and their SME members, as well as to support their SME members in going international and positioning them in the advanced smart packaging global value chain. Third-countries targeted by AdPack² are, among other, Canada and the United States. AdPack² has already planned study visits in Canada but also in the United States in July-October 2018. For the year 2019, AdPack² has planned to attend two Matchmaking Events, one in Canada and the other in the United-States. The PIMAP Partnership will seek to learn from the internationalisation experience of this partnership.

- EC2i⁸

⁵ <https://www.clustercollaboration.eu/escp-profiles/laser-go-global>

⁶ <https://www.clustercollaboration.eu/escp-profiles/discp>

⁷ <https://www.clustercollaboration.eu/escp-profiles/adpack2>

⁸ <https://www.clustercollaboration.eu/escp-profiles/ec2i>



With a focus on Environmental Services, Clean Production / Green Technologies as well as Eco-innovations, the main objective of this initiative is to stimulate internationalisation of innovative European SMEs into large and dynamic cleantech markets with high growth potential in the United States especially. EC2i planned to participate to matchmaking events in New-York, USA, on May 2018 and on June 2019. The PIMAP Partnership will follow the activities led by EC2i and seek to learn from their experience in the United-States. Moreover, EC2i signed a Memorandum of Understanding with another European Strategic Partnership, ESCT Go Global, therefore being a great source of inspiration for the PIMAP Partnership.

- ESCT Go Global⁹



With a focus on Information Technology and Analytical Instruments, Digital Systems and Representation but also on Intelligent inter-modal & sustainable urban areas, this partnership aims to stimulate the development of international activities in the SmartCityTech domain and to provide key information and knowledge on target markets, which includes the United States. ESCT Go Global is planning several study visits in the United-States in 2019. The PIMAP Partnership will follow the activities led by ESCT Go Global and seek to learn from their experience in the United-States.

- MobiGoIn-Action¹⁰



With a focus on Transportation and Logistics, as well as Smart green & integrated transport systems, the objective of MobiGoIn-Action is to build a Cooperation Partnership with international stakeholders in two identified World Regions, which includes the United States and Canada, in the field of technological innovation for smart mobility. MobiGoIn-Action went to the United-States in the framework of the ENRICH IN THE USA project, supporting research & innovation internationalisation support services to European researchers and innovators and to accelerate the access to the US market. The PIMAP Partnership will seek to exchange with MobiGoIn-Action on their mission in the US and cooperation with this project.

- NF4¹¹



With a focus on Food Processing and Manufacturing and Food, beverage & tobacco products, the overall objective of this project is the operational development of the joint internationalisation strategy. The third-countries targeted by NF4 are the United-States and Canada among others. NF4 intends to participate to a one-week mission dedicated to healthy and sustainable food in Quebec City, Canada (October 2018). On March 2019, NF4 will attend to a matchmaking event in San Francisco. The PIMAP

⁹ <https://www.clustercollaboration.eu/escp-profiles/escct-go-global>

¹⁰ <https://www.clustercollaboration.eu/escp-profiles/mobigo-in-action>

¹¹ <https://www.clustercollaboration.eu/escp-profiles/nf4>

Partnership will follow NF4 international activity in order to gain from their experience in Canada and the United-States.

- GEO-ENERGY EUROPE¹²

With a focus on Electric Power Generation and Transmission, Geothermal energy and Power generation / renewable sources, the overarching purpose of the GEO-ENERGY EUROPE is to develop, & propose an implementation roadmap for, a joint internationalisation strategy to help this ESCP go international. This partnership is currently defining the countries it will target with its internationalisation strategy, possible targets are Canada and the USA. The PIMAP Partnership will follow of GEO-ENERGY EUROPE international activities in the case it will decide to focus on the United-States and/or Canada.

- SpaceWave¹³



SpaceWave

With a focus on Information Technology and Analytical Instruments but also aeronautics and space, the objectives of this partnership are to study the international markets, to identify European and international stakeholders and analyse the related value chains. SpaceWave has not identified yet its targeted countries, but the PIMAP Partnership will follow its international activities, in case they are interested in the American and Canadian markets as well.

- SPACE2IDGO¹⁴



Space2IDGO

With a focus on Information Technology and Analytical Instruments, Satellite Technology/Positioning/Communication in GPS as well as Aeronautics & space, SPACE2IDGO objective is to implement an international business development action plan as defined during the SPACE2ID (Space Clusters International Industrial Diversification) project. SPACE2IDGO is clearly targeting Canada and the United-States for its internationalisation activities. The partnership has no event planned in those countries so far but the PIMAP Partnership will follow their activities.

4.4. European Strategic Cluster Partnerships for Smart Specialisation Investments (ESCP-S3)

The European Strategic Cluster Partnerships for Smart Specialisation Investments (ESCP-S3) is a call launched in the framework of the COSME Programme by the Executive Agency for Small and Medium-

¹² <https://www.clustercollaboration.eu/escp-profiles/geo-energy-europe>

¹³ <https://www.clustercollaboration.eu/escp-profiles/spacewave>

¹⁴ <https://www.clustercollaboration.eu/escp-profiles/space2idgo>

sized Enterprises on behalf of the European Commission. The call aims to boost industrial competitiveness and investment in the European Union via cross-regional cooperation and networking by supporting the establishment partnerships to facilitate cluster cooperation in thematic areas related to regional smart specialisation strategies. This call is linked to the establishment of the Smart Specialisation Platform on Industrial Modernisation and Investment and is envisaged to strengthen industry participation and inter-regional collaboration in the implementation of smart specialisation strategies¹⁵. 9 partnerships have been launched in Brussels by DG GROW (European Commission) and the Executive Agency for Small and Medium-sized enterprises (EASME). Among the 9 European Strategic Cluster Partnerships for Smart Specialisation Investments, one is particularly relevant for the PIMAP Partnership.

- CYBER SECURE LIGHT¹⁶



CYBER SECURE LIGHT is a European Strategic Cluster Partnership for Smart Specialisation Investments using photonics technologies applied to the Internet of Things, like Lighting and Home Automation systems for Smart Building. CYBER SECURE LIGHT is an interesting partnership for the PIMAP partners, as it is one example of applications of photonics technologies. In that sense, it would be

interesting for the PIMAP Partnership to get in touch with CYBER SECURE LIGHT to engage dialogue on good practices related to cross-sectoral collaboration between photonics and applicative markets, how photonics technologies can be used and integrated.

5. Horizon 2020 Programme

Horizon 2020 is the biggest EU research and innovation programme ever. It will lead to more breakthroughs, discoveries and world-firsts by taking great ideas from the lab to the market. Almost €70 billion of funding is available over 7 years (2014 to 2020) – in addition to the private and national public investment that this money will attract¹⁷. Horizon 2020 is a core part of the Europe 2020 strategy and aims at responding to the economic crisis to invest in future jobs and growth, addressing people's concerns about their livelihoods, safety and environment and strengthening the EU's global position in research, innovation and technology.

5.1. Projects supporting Photonics and Industrial Modernisation under the Horizon 2020 Programme

- NextPho21(2018-2020)

NextPho21 provides the decisive support to the European Photonics21 community for developing a European industrial strategy for the upcoming 10 years. The NextPho21 project consisting of the Photonics21 secretariat and 12 National Technology Platforms - representing more than 25 photonics cluster – runs at the request, with the consent and on behalf of the Photonics21 PPP Boards which will

¹⁵ <https://ec.europa.eu/easme/en/cos-clustpartn-2017-3-02-european-strategic-cluster-partnerships-smart-specialisation-investments>

¹⁶ <https://www.clustercollaboration.eu/escp-s3-profiles/cyber-secure-light>

¹⁷ http://ec.europa.eu/programmes/horizon2020/sites/horizon2020/files/H2020_inBrief_EN_FinalBAT.pdf

closely steer all activities of the project. Joensuu Science Park is a partner of the project and Photonics Finland is also represented in the project.

- EPRISE (2017-2020)



EPRISE project aims to promote and support Photonics as a KET with focus on Life Science applications in 4 target markets where Europe holds a leading position – Medical Technologies, Pharmaceuticals, Agriculture and Food. Companies developing photonics-based products for these markets face highly specific Go-to-Market challenges such as long time to market adoption, complex regulatory frameworks and high barriers to market entry to name but a few. Joensuu Science Park is a partner of the project and Photonics Finland is also represented in the project.

- MANU-SQUARE (2018-2020)

The MANU-SQUARE project creates a European platform-enabled responsible ecosystem acting as a virtual marketplace, bringing available manufacturing capacity closer to production demand to achieve their optimal matching thus fostering, on the one hand, fast and efficient creation of local and distributed value networks for innovative providers of product-services and, on the other hand, reintroduction and optimization in the loop of unused capacity that would be wasted otherwise. In a wider perspective the MANU-SQUARE project pursues a paradigm shift that disrupts the traditional static supply chain model and establishes dynamic value networks that can be arranged on-demand to couple the needs of buyers and the availability of sellers of manufacturing capacity. In so doing, this latter becomes an easily and efficiently tradable commodity towards lowered production costs for European companies and improved manufacturing ecosystem actual productivity.

1.1. Projects supporting international cooperation under the Horizon 2020 Programme

- ENRICH IN THE USA



ENRICH is the European Network of Research and Innovation Centres and Hubs. Promoted by the European Commission through Horizon 2020, the ENRICH Network currently offers services to connect European research, technology and business organisations with three global frontrunner innovation markets: Brazil, China and the USA. ENRICH in the USA is powered by NearUS, the H2020 initiative to establish a Network of European Research and Innovation Centres throughout the United States of America. ENRICH USA acts as a central contact point for European research and innovation actors seeking to grow and reinforce collaboration across the Atlantic. The mission of the Network is to provide standardised as well as tailor-made, research & innovation internationalisation support services to European researchers and innovators, to accelerate access to the US market, and maximise chances of success.

- BILAT USA



BILAT USA 4.0 is a bilateral cooperation project in the field of research and innovation between the European Union and the United States of America aiming at jointly enhancing and developing science, technology and innovation. BILAT USA 4.0 has four main goals: to contribute to research efforts addressing global challenges; to strengthen research excellence and boost economic competitiveness, to support Europe's role as a global actor; to carry out analysis proving a sound base for decision-making and partnership-building.

1.2. INNOSUP projects supported under the Horizon 2020 Programme

The INNOSUP initiative addresses the challenge to develop new cross-sectoral industrial value chains across the EU, by building upon the innovation potential of SMEs. The initiative was launched by the European Commission

- NEPUTNE



The NEPTUNE Blue Growth accelerator overall objective is to develop new cross-sectoral and cross-border industrial value-chains led by SMEs to foster the development of three key aspects for the Blue Growth industries in Europe and beyond: (1) the water management in urban and rural environment, (2) the fluvial and maritime transport and port logistics; (3) and the environment and renewable marine energy. This development will be allowed by the integration of new technologies and know-how between Water, Aerospace, ICT and Agriculture cluster actors/industries.

The PIMAP Partnership will closely follow the activities led by the NEPTUNE project, especially since the Regional agency for innovation in Nouvelle-Aquitaine is a strategic partner of the project. Aerospace Valley, also located in Nouvelle-Aquitaine is the coordinator of the project and involved in several European Cluster Strategic Partnerships.

- IoT4Industry



IoT4Industry connects 3 Information and Communication Technologies (ICT) clusters having strong competences in IoT with 4 Advanced Manufacturing clusters having strong competences in IoT with 4 Advanced Manufacturing clusters having access to tool manufacturers and manufacturing SMEs in order to encourage cross-border and cross-sectoral collaboration between SMEs from these two sectors. A hundred of support cases involving SMEs corresponding to different development stages (feasibility, prototyping, demonstration) will be selected through a call for proposals to receive funding and support, in view of further developing this new industrial value chain in European SMEs and improve their competitiveness on the global stage.

The PIMAP Partnership will closely follow the activities of the IoT4Industry project and promote it to the SMEs involved in advanced manufacturing.

2. Interreg Europe Programme

The Interreg Europe Programme is funded under of the European Regional and Development Fund (ERDF) and covers the whole European Union. The aim of the Programme is to improve policy delivery in European regions and local governments by exchanging experience, knowledge and good practices and by sharing solutions. The Interreg Europe Programme includes four different thematic platforms, named Policy Learning Platforms: 1) Research and Innovation, 2) SME competitiveness, 3) Low-Carbon Economy, 4) Environment and Resource Efficiency. The platforms are bringing together a wide range of stakeholders such as policy makers, public authorities, business support organisations dealing with regional development policies across Europe¹⁸ The Interreg Europe Programme organises on a regular basis open calls for projects supporting regional development. Two thematic platforms are highly relevant for the PIMAP Partnership:

- The Thematic Platform on Research and innovation
- The Thematic Platform on SME Competitiveness.

2.1. Projects dealing with Research and Innovation

3 Interreg Europe projects dealing with the thematic Research & Innovation are highly relevant for the PIMAP Partnership. Those projects are essentially dealing with the reinforcement of cluster linkages to foster innovation within regional ecosystems.

- ClusteriX 2.0 - New Models of Innovation for Strategic Cluster Partnerships



ClusteriX 2.0 seeks to improve regional innovation policies by making better use of clusters. ClusteriX 2.0 will identify new ways of facilitating intra and interregional cooperation. This shall be done by focusing on the identification and structured use of complementary industrial and research competences and by introducing new models of innovation through the implementation of strategic cluster partnerships. The project's objectives are: to increase the number of cross-sector collaborations and cluster partnerships within each partner region; to develop strategic interregional partnerships based on complementary competences identified through smart regional profiling.

The PIMAP Partnership will closely follow the activities led by ClusteriX 2.0 and will seek to develop synergies with the project and/or implement some of their good practices they identified to enhance cluster partnerships.

- ClusterFY



ClusterFY is a collaborative project aiming at intensifying Key Enabling Technologies (KET's)-related clusterisation processes. The project will also seek to support interregional cooperation between and among clusters and business networks and encourage their integration into innovative value chains. The ClusterFY project will also target SMEs to

¹⁸ <https://www.interregeurope.eu/>

help them to access regional and global value chains by supporting the development of long-term partnerships.

The PIMAP Partnership will closely follow the activities led by ClusterFY and will seek to develop synergies with the project and/or implement some of the good practices they identified to enhance cluster partnerships in Key Enabling Technologies.

- CLUSTERS3 - Leveraging Cluster Policies for successful implementation of RIS3



The CLUSTERS3 project aims to improve cluster policies and the performance of cluster organisations in their role of facilitating cooperation among SMEs, inserting SMEs in global value chains, and leveraging the successful implementation of RIS3. The project is expected to strengthen the innovation and competitiveness enablers on the regional level.

The PIMAP Partnership will closely follow the activities led by CLUSTERS3 and will seek to develop synergies with the project and/or implement some of the good practices they identified to enhance the participation of SMEs across the value chains created within the framework of the project.

2.2. Projects dealing with SME Competitiveness

2 Interreg Europe projects dealing with the thematic SME Competitiveness are highly relevant for the PIMAP Partnership. Those projects are essentially dealing with internationalisation support for SMEs.

- Inside Out EU - New approaches to improve SME internationalisation support policies



Inside Out EU addresses challenges SMEs face when going international and aims at helping overcoming these by reinforcing the so called virtuous triangle “collaboration-innovation-internationalisation”. The project focuses on enhancing regional and international partnerships and collaboration models for SMEs but also institutions and key actors on the level of governance, policies and dedicated tools and services.

The PIMAP Partnership will closely follow the activities led by Inside Out EU and will seek to develop synergies with the project.

- COMPETE IN - Competitive territories through internationalisation: SMEs competitiveness in globalised regions



COMPETE IN tackles SMEs’ internationalisation: a key issue for SMEs growth at global scale that still presents weaknesses. The project deploys a new methodology: approaching internationalisation not by addressing uniquely SMEs, but by addressing the regional systems’ of distinctive competences, always bearing in mind that the final objective is to support SMEs internationalisation.

The PIMAP Partnership will closely follow the activities led by COMPETE IN and will seek to develop synergies with the project.

3. Thematic networks and associations supporting photonics and advanced manufacturing

- AFPC – French Cluster Association



AFPC (Association Française des Pôles de Compétitivité) was created on the 16th of December of 2013 with the support of the Caisse des Dépôts et Consignations and the DGE (Direction Générale des Entreprises of the French Ministry of Economy). AFPC gathers 57 competitiveness clusters¹⁹It has 3 missions which will be managed by 3 committees dedicated to: enhance the role of clusters in the innovation dynamics with the government and the regions; be the voice of the clusters and their members for national and European authorities; support and promote the Clusters' SMEs Members.

Hervé Floch, DG of ALPHA-Route des Lasers & des Hyperfréquences is the President of the Europe Committee at the AFPC, therefore offering a privileged interface for dialog with the French regions, the State and the European Commission. The French clusters are also numerous in the European Strategic Partnerships, therefore enhancing the potential for cross-cluster/partnership cooperation.

- Photonics 21



The European Technology Platform Photonics²¹ unites the majority of the leading photonics industries and relevant R&D stakeholders along the whole economic value chain throughout Europe. Today Photonics²¹ has more than 2500 members. Photonics²¹ aims to establish Europe as a leader in the development and deployment of photonics technologies within the various applications fields such as ICT, lighting, industrial manufacturing, life science, safety as well as in education and training. The ETP Photonics²¹ coordinates photonics research and innovation priorities and provides input to the European research framework programme Horizon 2020.²⁰

¹⁹ <http://www.afpc.eu/>

²⁰ <https://www.photonics21.org/index.php>

- Photonics France



Photonics France is the merger of the former professional trade-union for photonics and the National Photonics Committee. It gathers professionals from the optics and photonics sectors. Photonics France became in April 2018 the National Federation for Photonics. The objective of Photonics France is to actively contribute to development of the sector and its application fields: health, research, environment, transportation, smart buildings, lighting, defence and safety.

- Photonics Finland



Photonics Finland is a technology-oriented association that drives the photonics industry in Finland by connecting Finnish photonics companies, research centers, and public authorities. Photonics Finland supports the development of the photonics field from basic research through to the deployment and market launch of products. It is the single point of contact for photonics ecosystem in Finland.

Photonics Finland is closely link to Joensuu Science Park and has already being involved in the the first PIMAP workshop for SMEs in Finland by providing a highly-valuable support in the organisation of the event and facilities for the PIMAP partners.

- Photonics Sweden

 *PhotonicSweden* PhotonicSweden is the Swedish national platform in optics and photonics. PhotonicSweden aims at catalysing fruitful cooperation between companies, universities, and contributing to a healthy regrowth of engineers in optics and photonics and increasing the awareness among the general public and politicians of the strategic importance of optics and photonics for the future of Sweden.

4. Conclusions

The ecosystem supporting photonics and advanced manufacturing appears to be very well developed at the European scale, including several structuring initiatives/projects for the PIMAP Partnership. The regional priorities related to research and innovation in each cluster ecosystem are also fully in line with the objectives of the PIMAP Partnership. The PIMAP Partnership will actively seek to develop linkages with the most relevant stakeholders for the action planned in the framework of the project.

The PIMAP Partnership will therefore seek to insert its action within the existing European framework, especially by taking part to the actions developed by the European Cluster Collaboration Platform and the European Observatory for Clusters and Industrial Change. Contacts with the other European Cluster Strategic Partnerships targeting the United-States and Canada will also be established, especially for the organisation of the business missions planned for the duration of the project. In particular, the LASER-GO-GLOBAL Partnership appears a strategic potential partner for the implementation of the activities planned in the framework of the PIMAP project. Horizon 2020 projects can also provide an interesting springboard for the PIMAP partners as they provide a favorable general framework for cross-sectoral cooperation and internationalisation activities. Good practices can be found as well within Interreg Europe project to enhance the cooperation between the cluster partners and the internationalisation of SMEs. Common interest has been identified with the LASER GO GLOBAL project, both in terms of technology used and targeted markets. While LASER-GO-GLOBAL focuses on applications related to the health sector, the PIMAP Partnership is working towards industrial applications. The connections between the two projects are highly relevant as they allow to identify potential cooperation partners related to photonics in third-markets. At this current stage, the PIMAP Partnership is focusing on the American and Canadian markets. Potential American and Canadian cooperation partners are both of interest for LASER-GO-GLOBAL and the PIMAP Partnership. In the future, a common approach could be envisaged to address those stakeholders.

The networks and associations supporting photonics and advanced manufacturing can also act as facilitators to support the activities of the PIMAP Partnership, especially to involve SMEs, support cross-sectoral cooperation and provide valuable advice for the international activities planned within the framework of the project.

Considering the flourishing ecosystem supporting photonics and advanced manufacturing in Europe, the PIMAP Partnership is willing to develop its action in synergy and coherence with the different initiatives identified in this report.

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