



Photonics21 – Photonics PPP
Annual Activity Report 2018



PHOTONICS PUBLIC PRIVATE PARTNERSHIP

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Photonics PPP Progress

Feedback Calls 2018

In the Work Programme 2018-2020, two calls addressed photonics topics:

1) ICT-03-2018-2019: Photonics Manufacturing Pilot Lines for Photonic Components and Devices

Acknowledging the fact that “Photonics is driving innovation in many different application areas”, the challenge behind this call “is to help European companies become more competitive by improving their business/production processes as well as products and services by means of photonics technology. The aim is to accelerate the design, development and uptake of photonics technology, by a wide range of industrial players, in particular SMEs by providing low-barrier access to volume production of advanced photonics components available to a wide range of industrial players, in particular SMEs which would otherwise not have easy access. Photonics Manufacturing Pilot Lines should form the basis for future Photonics Digital Innovation Hubs.”

The focus of this call lay on Manufacturing Pilot Lines, i.e. on “actions [that] should provide open access to manufacturing of advanced photonics components and systems and offer related services including design and characterization”.¹

2) ICT-04-2018: Photonics based manufacturing, access to photonics, datacom photonics and connected lighting

This call addressed the specific challenge of reinforcing “the innovation ecosystem by providing access to advanced photonics technology to researchers and thereby accelerating the deployment of the next generation of disruptive photonics technologies” – more specifically:

- “to build capabilities for automated mass manufacturing of datacom photonics in Europe”, [...]
- to support “the integration of lighting with the Internet of Things, offering new functionalities beyond illumination”, [...]
- to promote the “development and application of innovative photonics based manufacturing solutions [that] will open new ways of producing more goods with fewer raw materials, less energy and less waste.”²

The focus was on the following themes:

a) Innovation Actions

- Access to advanced photonics for researchers:** The objective is provide photonics and non-photonics researchers with a one-stop-shop access to a wide range of existing cutting edge technology platforms as well as services needed to facilitate their use (such as design, measurement and packaging).
- Enabling automated mass-manufacturing of datacom photonics products:** Actions should demonstrate automated manufacturing of optical transceivers with transfer rates above 1Tb/s at competitive costs according to the interconnection distance. Actions should cover all manufacturing steps of proven designs from chip manufacturing to photonic/electronic integration through to packaging and testing, and final demonstration in a real environment. Standardisation should be addressed.
- Connected Lighting:** The action should focus on integrating lighting infrastructure with the Internet of Things and demonstrating new functionalities such as visible light communication for indoor positioning and broadband data communication. Development and integration of new technologies as security and multicast communication into open architectures must be demonstrated in real environments. Standardisation of a reference architecture must be one of the main goals of the action.

¹ European Commission, Work Programme 2018-2020, 5.i. Information and Communication Technologies, European Commission Decision C(2018) 7238 of 13 November 2018, p. 12.

² European Commission, Work Programme 2018-2020, 5.i. Information and Communication Technologies, European Commission Decision C(2018) 7238 of 13 November 2018, p. 13-14.

b) Research and Innovation Actions

- i. Highly Productive Ultra-Short Laser Systems for Fast Materials Processing:** the development of ultra-short pulse laser systems with pulse durations in the nanosecond regime down to the femtosecond regime and with average beam power levels of at least 1kW enabling fast materials processing with minimal heat impact on the work piece. Pulse energies and wavelengths must be appropriate for the intended application. Proposals may include also the related monitoring and closed loop control aspects. The developed system should be demonstrated with a relevant industrial application.
- ii. Tailored Laser Beams for Laser-based Manufacturing:** new methods and schemes of beam shaping providing the optimal energy delivery on the work piece with a high spatial and temporal resolution. Proposals may include also the related monitoring and closed loop control aspects. The developed system should be demonstrated with a relevant industrial application.³

As a result of the 2018 calls, 14 new projects for a total budget of over € 71 million have just started. In 2018, under the Call for Photonics Manufacturing Pilot Lines for Photonic Components and Devices, (ICT-03-2018) one Innovation Action (IA) for 14M€ was selected, while under the Call for Photonics based manufacturing, access to photonics, datacom photonics and connected lighting (ICT-04-2018), 5 IAs and 8 RIAs (Research and Innovation Actions) for 71M€ were funded – in all, 14 projects for 85M€.⁴

The following table gives an overview of the number of projects funded as well as the budget allocated in the frame of last year’s calls:

Overview of projects and budget allocated in the 2018 calls

Type(s) of action	Number of projects funded	Total budget	Total EC contribution
RIA	8	€ 42.363.773,76	€ 42.363.773,75
IA	6	€ 50.561.432,50	€ 42.924.888,26
CSA	0	0	0

Source: EC, Cordis

Implementation of the calls for proposals evaluated in 2018

Evaluation results on the cPPP calls closed in 2018

Call reference	Submitted proposal			Evaluation results		Success rate%
	Submitted proposals	Eligible proposals	% of retained	Above threshold	Selected for funding	
H2020 –ICT-3-2018	2	2	100%	1	1	50
H2020 –ICT-4-2018	34	34	100%	25	13	38.2

Source: EC, DG CONNECT

³ European Commission, Work Programme 2018-2020, 5.i. Information and Communication Technologies, European Commission Decision C(2018) 7238 of 13 November 2018, p. 14-15.

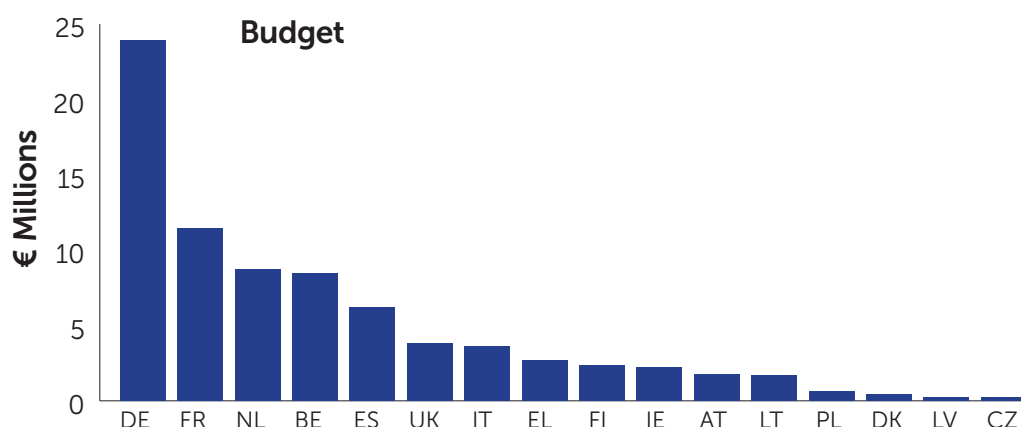
⁴ <https://ec.europa.eu/digital-single-market/en/news/fourteen-new-photonics-projects-have-been-launched>.

Number of participations in the cPPP calls closed in 2018 and success rate by organisation type in 2018⁵

Type participant	No of participants in the proposals	Nr of participants in the funded projects	Participants success rate	Share of participation
Public Bodies	1	0	0%	0%
Research organisations	80	36	45%	18%
Higher or secondary education	68	28	41%	14%
Private for profit (excl. education)	194	77	40%	39%
Others	32	11	34%	6%
Total	375	152	32%	100%
SMEs	116	44	38%	22%

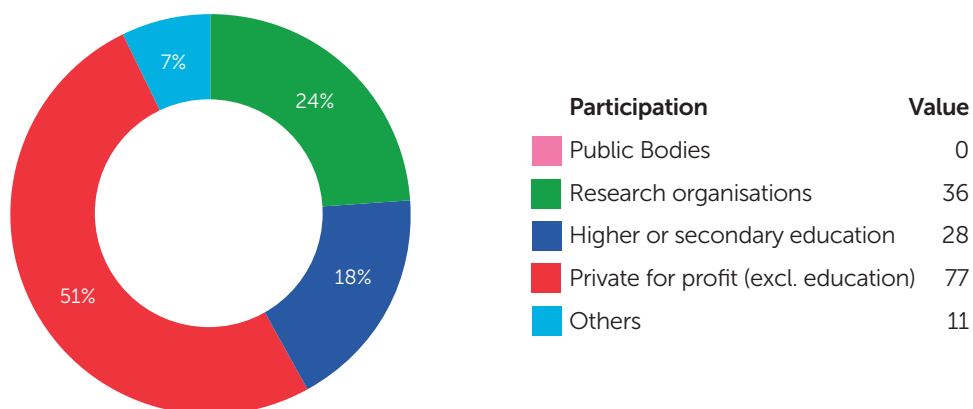
Source: EC, DG CONNECT

EC Funding per Country in cPPP Calls closed in 2018⁶



Source: EC, DG CONNECT

EC participation per Type of organisation in cPPP calls closed in 2018



Source: EC, DG CONNECT

⁵ Please notice that this table excludes third parties.

⁶ Please notice that the date classification provided in the tables C and Figure A and B is based on data self-declared by the participants at the moment of proposal submission, and quite a high number of "unclassified data" appear as "other". However, data provided in table 1 was extracted from the CORDA database, after the signature of the Grant Agreement and has been manually checked and amended if necessary.

The Photonics PPP projects, resulting from the 2018 calls, started in the last months of 2018 or 2019. An overview of the entire portfolio of the funded Photonics PPP projects can be found in the annex of this report (Stand: March 2019) as well as on www.photonics21.org/ppp-projects, where a summary of all the funded projects is provided, and divided by topic areas. Each project has a brief description of its objectives and is regularly updated.

Overview of funding since 2014

Overall, the EC has funded 101 Photonics PPP Projects under the Horizon 2020 frame since 2014 to the totaling approximately €459.6M. With regard to the 2018 calls, the industrial participation within PPP Projects accounts for more than 50%, of which 53% are SMEs (cf. table below).

An overview of the last years is provided in the table below. Here it shows the distribution of partners is slightly dependent on the topics and the industrial participation remains close or even over 50%.

Key figures of Horizon 2020 Photonics PPP Projects⁷

Subject	2014	2015	2016	2017	2018	2014–2018
Total Funding for Projects (in €)	87,861,568.12	95,306,838.23	94,800,954.01	96,387,748.75	85,288,725.02	459,645,834.13
Number of Participants in Projects	215	209	230	200	163	1,017
Industrial Participation (# of Companies)	111	106	118	134	87	556
% of total participants	52%	51%	51%	67%	53%	55%
Of which are SMEs (# of SMEs)	62	58	67	42	46	275
SME % of industry participants	56%	55%	57%	31%	53%	50%
SME % of total participants	29%	28%	29%	21%	28%	27%
Budget for Industry (in €)	45,846,170.94	33,306,845.17	45,219,997.46	33,921,088.91	3,167,137.52	201,461,240.00
% of total funding	52%	35%	48%	35%	51%	44%

Source: European Commission, DG CONNECT, 03/19.

Monitoring of progress and success of the Photonics cPPP – Key Performance Indicators (KPIs)

In order to measure the overall progress of the Photonics cPPP, to control the bold commitment of the European Photonics industry, but also the functioning of the PPP itself, a set of Key Performance Indicators (KPIs) were laid out in the PPP contract. In the course of the project additional KPIs were defined for all contractual Public Private Partnerships (cPPPs) in order to enable the EU Commission and external evaluators to compare progress and success of the various cPPPs.

The contracted KPIs cover the impact of the Photonics cPPP on the Industrial Competitiveness and the European Economy, its socio-economic impact as well as some operational aspects of the PPP (efficiency, openness and transparency of the PPP Consultation Process) and some performance aspects (a. o. time to contract, levels of response to calls, progress against technology roadmap timetable, Participation of Industry & SMEs in PPP projects).⁸ The list of

⁷ Please notice that this table includes third parties

⁸ European Technology Platform Photonics21 (2013): A Photonics Private Public Partnership in Horizon2020, Brussels, p. 18.

Key Performance Indicators used, as well as details related to their assessment, are given in the Photonics cPPP Progress Monitoring Report published in November 2018.⁹

The newly added common KPIs for all cPPs are addressing similar KPIs and measuring methods for

- Mobilised private investment /direct and indirect Leverage Effects
- Number of new skills and/or job profiles across all hierarchies
- Impact of cPPP on SMEs / Qualitative Analysis
- Significant Innovations / Innovation Radar

They will be displayed in a publicly available yearly “Progress Monitoring Report” of each cPPP also on the EU Commissions Websites.

Over the last years, the evaluation of the Key Performance Indicators (KPIs) has been performed combining desk research, additional market and impact studies on behalf of the Photonics21 Secretariat/Association as well as via an online survey among the project coordinators of past and current Photonics PPP projects.

The following table summarizes the results of last year’s online survey carried out in April 2018 and addressed to 84 current PPP Projects with a good response rate of 60.7%. More details can be found in the Photonics cPPP Progress Monitoring Report 2018,¹⁰ that was published in November 2018.

Overview of the Monitoring of the Common KPIs as a Result of an Online Survey

Number of new systems or technologies :	1–3 projects (excluding ACTPHAST and PILOT LINES).
Number of patent applications :	5 projects (11%) applied for 1 patent, 2 projects (4.4%) for 2 patents and respectively 1 project (2.2% of all respondents) applied for 4 and 5 patents.
Number of projects active in:	
Standardisation activities :	21 of projects (46.7% of all valid answers) declare that there are standardization activities or contribution to new standards at project level.
Leverage factor project participants	31 projects (i.e. 68.9%) declare a 1–3 leverage factor, 3 projects a 4–5 leverage factor (6.7%) and 11 projects declare 0 leverage (24.4%).
SME turnover increase :	10 projects (22.2%) declare 6–10% turnover increase and even 13 projects (28.9%) declare a higher turnover increase. However, 13 projects (28.9%) declare no turnover increase.
Spin-offs / Start-ups arisen from the project:	1 project reported more than 1 spin-off or start-up, 1 reported from one spin-off, more than half of the projects – 24 of 45 expect spin-offs or start-ups later, 3 do not know and 16 said ‘no’.
New high-skilled jobs created :	Most projects (21, 46.7%) have 1–5 new jobs, 6 projects declare 6–10 new jobs, 5 projects declare 11–20 new jobs and respectively 1 project declares 21–50 new jobs and more than 50 jobs.
Outreach :	Most projects (54.5%) have 1–5 outreach activities as well 1–5 joint public publications issues in the scope of the project (29) or even more up to 6–10 (4).
Total number of new curricula :	More than 30.
Results for higher technology readiness level:	Most projects (19, i.e. 42.2%) declare that 1–3 project results will be taken up for higher technology readiness levels using additional investments. 13 projects (28.9%) declare 4–5 project results, 7 projects (15.6%) declare 6–10 results and even 2 projects (4.4%) declare more than 10 results.

Source: VDI TZ GmbH, Photonics cPPP Progress Monitoring Report 2018.

⁹ European Technology Platform Photonics21 c/o VDI Technologiezentrum GmbH, Photonics21 Secretariat (2018): Photonics cPPP Progress Monitoring Report 2018, Düsseldorf.

¹⁰ European Technology Platform Photonics21 c/o VDI Technologiezentrum GmbH, Photonics21 Secretariat (2018): Photonics cPPP Progress Monitoring Report 2018, Düsseldorf.

This year the Survey will take place in April/May 2019 and adds also questions related to the new requirements of KPIs as mentioned above. Aside from the Survey also an additional Study by Tematys is initiated supporting Photonics Secretariat in the desk research on the overall role photonics play in Horizon 2020, the extrapolation of survey results to the photonics ecosystems and with sample studies on such new KPI topics like job profiles and skills required.

Additional private investments and outputs

A major aim of the Photonics PPP is to trigger common investments of industry and the public side in a jointly agreed Strategic Research and Innovation Agenda. In this respect the private side committed to leverage the investment of the European Commission by a factor of 4 by 2022 (Horizon 2020 +2 years).

Already at this stage where most of the Photonics PPP projects are still in its early stage and first commercialisation and manufacturing of the R&I project results has not even been started, most PPP projects report already of a leverage factor of 1–3, some even 4–5 (cf. §3.2).¹¹ Since the commercialisation and manufacturing requests significant investment – often 10x or more than in the R&D phase – it can be safely assumed that the committed leverage factor of 4 will be easily met by the photonics industry.

Looking in the overall European Photonics Industry the Capex and R&D spending amounts to more than 10 billion Euros (Capex: €9.6bn Euros + R&D spending of €3.1bn Euros) and indicates a far higher innovation spending than the EU funding for Photonics under Horizon 2020 which is in the range of €0.7–1.0bn Euros.¹²

One of the aims of the Photonics PPP is to provide an incentive for companies in the Photonics sectors to increase their R&D budget. A former study based on 2014 data, shows that the promise has been honoured: European industry and EU policy have joined forces to increase R&D&I investments, with the photonics sector leveraging public investment in the PPP projects by a factor of 4.3.¹³ Today's Photonics industry is an attractive sector for investment: with companies already active in this sector wanting to consolidate their position or external investors seeking to profit from the potential offered, many see the lucrative appeal and potential of light technologies. More details on this topic can be found in the Photonics cPPP Progress Monitoring Report 2018, that was published in November 2018.¹⁴

Overview on funded Photonics PPP projects

An overview on all past and current funded Photonics PPP projects, arranged by Working Groups, is given in tabular form in the Annex.

This overview can also be found under the following link on the Photonics21 website: www.photonics21.org/ppp-projects/ where a summary of all the funded projects is provided and divided by topic areas. For each project there is a brief description of its objectives. This list is regularly updated.

Bridging the valley of death: PPP Pilot Lines and Prototyping Projects

The Pilot Lines funded in the frame of the cPPP intend to give European industry access to photonics solutions and manufacturing, allowing the opportunity to test and validate ideas and new products prior to market entry. SMEs are a specific target since they often lack the financial resources and the infrastructure needed to bridge the gap between 'lab and fab' and

¹¹ European Technology Platform Photonics21 c/o VDI Technologiezentrum GmbH, Photonics21 Secretariat (2018): Photonics cPPP Progress Monitoring Report 2018, Düsseldorf.

¹² European Technology Platform Photonics21 c/o VDI Technologiezentrum GmbH, Photonics21 Secretariat (2018): Photonics cPPP Progress Monitoring Report 2018, Düsseldorf.

¹³ European Technology Platform Photonics21 c/o VDI Technologiezentrum GmbH, Photonics21 Secretariat (2017): Jobs and Growth in Europe – Realizing the potential of Photonics, PPP Impact Report 2017, Düsseldorf.

¹⁴ European Technology Platform Photonics21 c/o VDI Technologiezentrum GmbH, Photonics21 Secretariat (2018): Photonics cPPP Progress Monitoring Report 2018, Düsseldorf.

to develop, test and manufacture new products. Following pilot lines have been established so far:

- PIXAPP - PIC assembly and packaging pilot line, focusing on silicon photonics
- PIX4Life - visible-light detection and imaging systems for biomedical applications.
- PI-SCALE - pilot line for organic LEDs (OLEDs)
- MIRPHAB - of mid-IR photonic sensors for chemical sensing and spectroscopy

At the end of 2018, two new pilot lines were created: the Open-Innovation Photonics pilot for North-West Europe (OIP4NWE), a €13.9 million project supported by the Interreg North-West Europe program and the other InP pilot line, InPulse, that will be funded through the Horizon 2020 E.U. framework program via the Photonics Public-Private Partnership (PPP).¹⁵

In addition to these Pilot Lines, 3 PPP Prototyping Projects were created over the last years, providing development support, mentoring and prototyping services to companies. The ongoing project ACTPHAST 4.0¹⁶ provides photonics and non-photonics companies and researchers with one-stop-shop access to a wide range of existing cutting edge photonics technology platforms from Europe's top research centres. The ACTPHAST4.0 network offers a single streamlined way to access 200 of the best experts and technologies from 24 of Europe's leading photonics research institutes, covering the entire supply chain to accelerate the demonstration of exciting new scientific breakthroughs towards a working prototype.

Reaching out to end user industry – Photonics PPP workshops in European Regions

Photonics21 and its partners are holding regional end-user industry workshops, e.g. "Photonics for Smart Farming" or "Photonics for Industry 4.0" in photonics future market areas. End user industry workshops will serve two purposes. It will provide an opportunity to get direct feedback from end-user industry on the photonics industrial strategy. These workshops will furthermore establish links and synergies between photonics SMEs as technology providers and end-user industries in the regions, to set up new collaborations and to foster broader deployment of photonics innovation. The National Technology Platform consortium partners responsible for the individual workshops will share the results and feedback of each workshop with the Photonics21 community as part of the Photonics21 strategy development process. Strategic partnerships of end-user industry companies and photonics startups are an effective approach enabling growth of start-ups by getting into contact with first customers.

By the end of 2018, 4 end user workshops had been conducted. This is very much in line with the aim of 15 workshops throughout the whole project. To maintain a common branding we had developed a corporate design for these workshops. Through the Photonics21 website the workshops were announced and could also be shared in other channels. For quantifying the impact of the end user workshops, a questionnaires were developed in 2016. Using this questionnaires the success can be measured and compared to other workshops.

Below, the end user workshops conducted in 2018 are presented.

Overview end-user workshops conducted 2018:

Partner	Title	Location	Date
VSLP	Photonics 4 European Industry of the Future	Geneva	13.6.2018
UPC	Photonics 4 Ceramics	Castellon	05.07.2018
JSP	Photonics 4 Forestry	Koli	10.10.2018
PA	Photonics 4 Industrial Production	Vienna	29.10.2018

Source: VDI TZ GmbH.

¹⁵ www.osa-opn.org/home/industry/2018/december/photonic_pilot_lines_expand_in_europe/, last accessed on 2019/03/15.

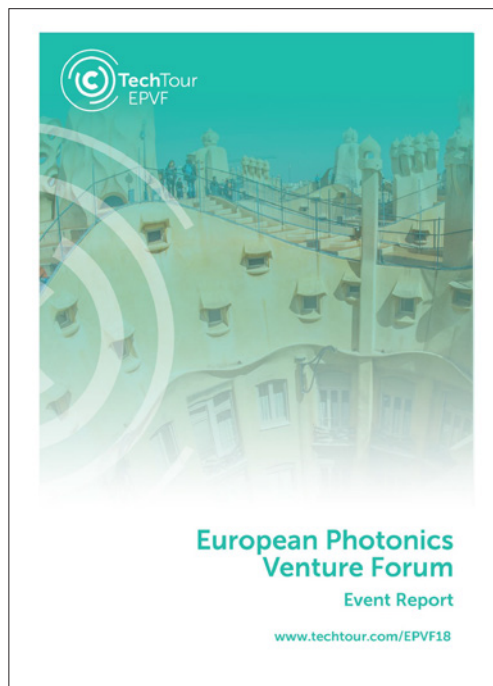
¹⁶ <https://actphast.eu/>.

Increase investment in photonics: the “European Photonics Venture Forum”

The European Photonics Venture Forum (EPVF) is a meanwhile well-established event, taking place yearly in different regions and bringing “together entrepreneurs, investors, corporates and policy makers in an intense and high-energy programme of pitching, ideas sharing, networking and direction setting”.¹⁷

The 2018 edition was the fourth edition of the European Photonics Venture Forum (EPVF) and was organized as part of the H2020 Innovation Action, Actphast 4.0, and in conjunction with the coordination and support action Nextpho21, both co-funded by the European Commission, part of the programme ICT-30-2018 - photonics KET 2018, as well as with strong support of high-ranking members of regional, national and European photonics organisations:

- ICFO (The Institute of Photonic Sciences),
- SECPhO (Southern European Cluster in Photonics and Optics)
- Fotónica21 (the Spanish Technology Platform for Photonics)
- EPIC (European Photonics Industry Consortium)
- ECOP (European Centres for Outreach in Photonics)



The main objectives of EPVF 2018 were to – market the photonics sector to a wider investor community; – create channels to finance the sector; – select and promote high-potential photonics businesses; – support the funding in the sector”.¹⁸

More than 30 selected start-ups and scale-ups, as well as more than 80 investors/ industry experts attended the EPVF2018. This year for first time, the EPVF hosted a specialized investor-only session aiming to unite both public and private investors involved in the Photonics domain in order to discuss potential collaboration for supporting photonics companies and overall the development of the photonics industry as key enabling technology. “The speakers shared best practices on supporting photonics entrepreneurs and industry in the “network of network” approach in an exclusive investors’ only meeting setting. The investors’ meeting and discussion was supported and attended by representatives

of the European Commission, European Investment Bank, PhotonDelta, ACTPHAST 4.0, as well corporate investors.”¹⁹

A further particularly good opportunity to show the economic impact of photonics will be to link the European Photonics Venture Forum 2019 with the “Laser.World of Photonics 2019” industrial fair in Munich, since the most innovative photonics companies will be present at the fair and the Startup-World organised in the scope of the fair provides an additional incentive for venture and corporate venture capitalists to attend the event.

¹⁷ European Photonics Venture Forum, Event Report, www.techtour.com/EPVF18, p. 3.

¹⁸ European Photonics Venture Forum, Event Report, www.techtour.com/EPVF18, p. 18.

¹⁹ European Photonics Venture Forum, Event Report, www.techtour.com/EPVF18, p. 7.

European photonics strategy development & implementation

Launch of the European photonics strategy process – Photonics Public Private Partnership Annual Meeting 2018

The Photonics21 PPP Annual Meeting is the flagship event for the European photonics community. It has become the most important event for exchange, discussion and networking between C-level representatives from industry, research and politics. The two days Photonics PPP Annual meeting marks the starting point for any strategy development and implementation activity.

The Photonics21 PPP Annual Meeting 2018, entitled #next.photonics_forum “Winning the future – Europe’s age of light” was held on 8th/9th March 2018 in the Royal Museum of Fine Arts and the Bluepoint Conference Centre in Brussels. More than 300 key stakeholders of the European photonics community attended the event and the annual gathering set about defining the challenges that lie ahead in photonics research & innovation and its applied fields. Lucilla Sioli, Director for Digital Industry within DG CONNECT, paid homage to the Photonics PPP as being “one of the best and most efficient contractual PPP’s we have ever seen in the Commission”. Keynote speaker Carl Buhr, the European Commission’s deputy head of cabinet, discussed the challenges and opportunities of a digitized world in which photonics plays a vital role. Several notable speakers further contributed to the symposium, such as Jean-François Hebert, Vice President Sales Global Accounts High Tech Industry, Dassault Systèmes SE and Prof. Dr. Michael Totzeck, Fellow Corporate Research and Technology Carl Zeiss AG University of Konstanz.

The second event day focused on the Photonics21 workshop sessions as official kick-off event for the European photonics strategy process. During the eight workshop sessions, the workshop participants started the interactive discussions about the future photonics research and innovation challenges. The inputs of the different workshop sessions contributed to the further strategy process to work out a new European photonics strategic roadmap in preparation of the new EU framework programme Horizon Europe.



Source: Iris Haidau, VDI TZ GmbH.



Source: Iris Haidau, VDI TZ GmbH.

European Photonics Strategic Roadmap 2021-2027



In designing a new strategy for European photonics, Photonics21 has built on the Photonics PPP's proven collaborative approach. In preparation of Horizon Europe, Photonics21 consulted in the course of 2018 with the European photonics community, including more than 3,000 people affiliated to more than 1,700 companies and research organisations. In a series of 12 workshops and based on the Photonics21 vision document "Europe's Age of Light! How photonics will power growth and innovation" the European photonics community developed the new European Photonics Strategic Roadmap, which will be published and handed over to the European Commission on 27th March 2019 alongside the Photonics PPP Annual Meeting 2019.

The Photonics21 secretariat coordinated the overall strategy process, prepared the workshop sessions and was responsible to ensure an open and transparent community process where all members of the different Photonics21 work groups were invited to provide their feedback to the thematic chapters of the roadmap.

The new photonics roadmap outlines the future photonics research and innovation challenges for the next 7 years in following areas:

- Information & Communication
- Industrial Manufacturing & Quality
- Life Sciences & Health
- Emerging Lighting, Electronics & Displays
- Security, Metrology & Sensors
- Design & Manufacturing of Components & Systems
- Photonics Research, Education & Training
- Agriculture & Food
- Automotive & Transport

Following the publication of the photonics roadmap the Photonics21 community will prepare concrete proposals for photonics call topics for the new EU framework programme Horizon Europe work programme 2021-2022 based on the identified research and innovation challenges as outlined in the new photonics roadmap.

A pdf version of the photonics roadmap is available for download at the Photonics21 website: www.photonics21.org/ppp-services/photonics-downloads.php

Ensuring a fair representation of the community in Photonics21 Board of Stakeholders – the main decision-making body of PPP

The Photonics21 Board of Stakeholders (BoS) represents the main decision making body of the platform. It is democratically elected by the full Photonics21 membership. Due to the critical role and decision power of the BoS, it is of utmost importance that it is elected in an open, transparent and fair election process. An online voting system following highest standards was established to ensure the trust of the community in this process and therewith keeping the engagement of the members. The Photonics PPP Partnership Board, consisting of the Deputy Director of European Commission DG Connect, Photonics Unit representatives and the democratically elected Photonics21 Executive Board members is the main body for implementing the strategy agreed.

Election of 2018 Board of Stakeholders:

Key Data of 2018 online election

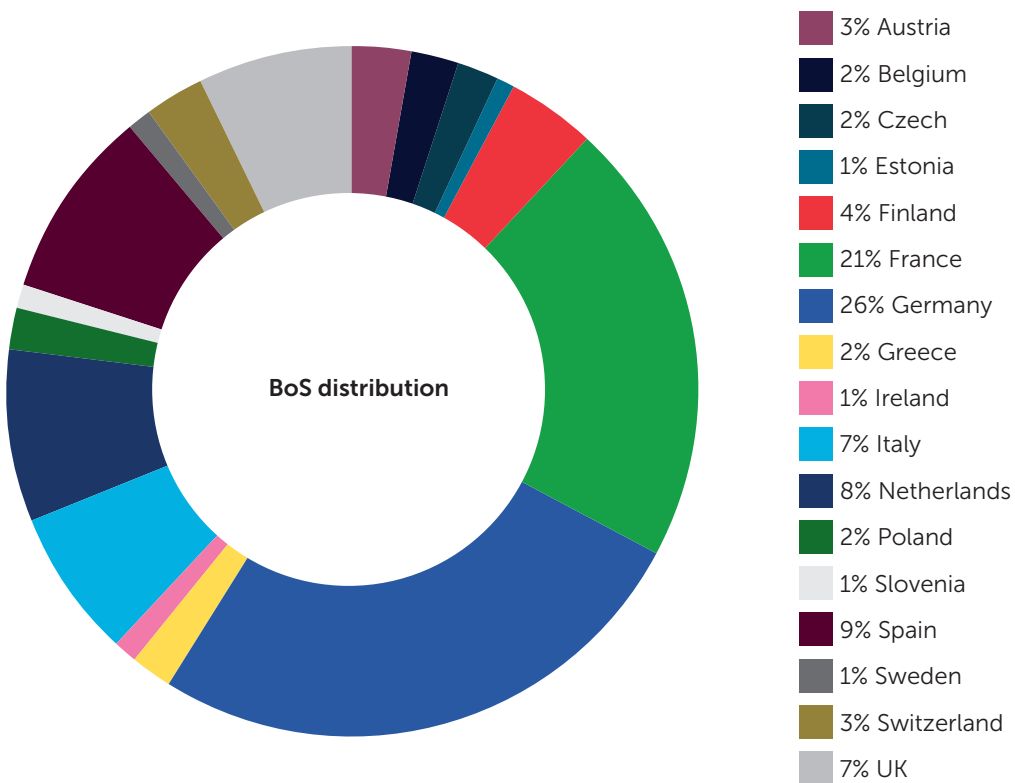
- Time period of election: 22 October – 6 November 2018
- Open seats: 39
- Candidates: 42 (17 Industry, 14 Research, 11 Others)
- Registered voters representing affiliations: 282
- Final voters: 240 (85,11% participation)
- 240 valid ballots (no invalid ballots)

Composition on New Board

- 100 BoS members/representatives
 - 50% Industry
 - 35% Research
 - 15% Others
- Member States represented 17
- Gender equality of BoS: 96% male / 4% female
- No issues occurred (concerning country > 30% / or type of organisation min. 50% industry)

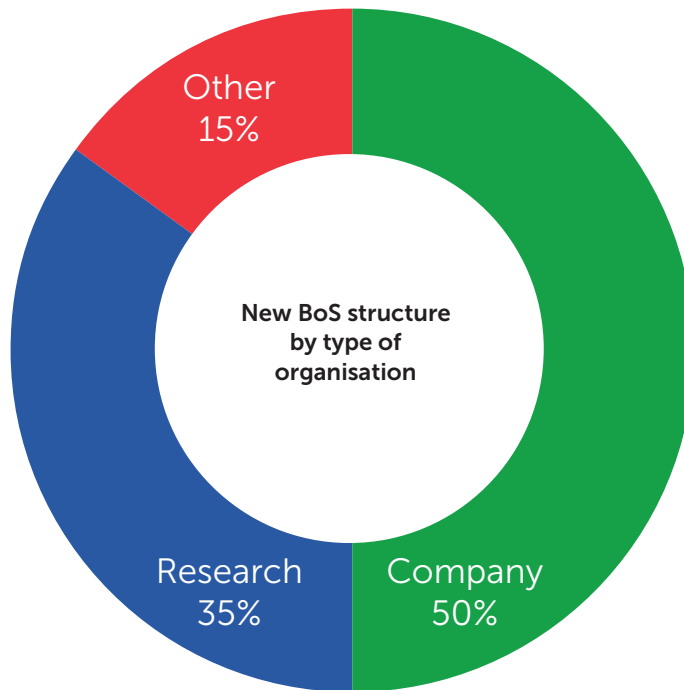
Source: VDI TZ GmbH.

Composition of 2018 elected Board of Stakeholders by country



Source: VDI TZ GmbH.

BoS online elections 2018 – structure of voters



Source: VDI TZ GmbH.

Cooperation of strategic H2020 Photonics KET (PPP) projects

Horizon2020 Photonics KET projects are the main implementation mechanism for the PPP supporting the implementation of the photonics industrial strategy. Especially CSA and pilot line / prototyping projects can benefit from best practice sharing and often even have an overlap in its tasks and activities. Photonics21 focuses on the better coordination between these projects and on the cooperation between them in order to create synergies and create single entry points for PPP CSA / piloting services.

There are several CSA projects supporting the Photonics PPP such as ACTPHAST 4.0, EPRISE, LASER-GO, PICS4All, PHABLABS 4.0, Photonics4All and RespiceSME.

Following the mapping of the activities of the projects, a number of joint activities were carried out during 2018. The services of the different projects to SMEs were collected in a brochure entitled "Photonics PPP Services to European SMEs" which has been published on the Photonics21 website www.photonics21.org/ppp-services/photonics-downloads.php. The brochure outlines all services to SMEs offered by CSA projects and indicates a contact point for each service.

Two telephone conferences took place in 2018 to inform the different project leaders on each other's activities and initialise collaboration and support each other. Some examples on collaboration between the different CSA projects in 2018 include e.g. the promotion of the Photonics21 workshop "Agriculture & Food", which was held on 24th September 2018, on the EPRISE website and twitter account. Photonics21 further promoted the EPRISE roadmap workshop Photonics4Healthcare on 11–12 June 2018 in Stockholm on its website. Furthermore, in order to have a broader communication of the Prototype Your Idea contest, the CSA projects will support Photonics21 to promote the contest broadly.

Member States start joint Photonics call under the EUREKA scheme

Activities of the Photonics21 Mirror Group

MIRROR GROUP OF THE



PHOTONICS PUBLIC PRIVATE PARTNERSHIP

The Mirror Group constitutes the public side of the industry-led Photonics21 Board of Stakeholders. It supports and reflects, or "mirrors", the activities of Photonics21 at a policy level and from a governmental perspective.

The Mirror Group was established in July 2007. It is composed of representatives from relevant European, national and regional public authorities such as ministries involved with research and innovation, funding agencies and the European Commission. In general, the Mirror Group functions as an inter-governmental panel for exchange, discussion and concerted planning on photonics-related research policy in Europe.

In 2018, the Photonics21 Mirror Group prepared the first joint EUREKA / Photonics21 Mirror Group call Photonics for advanced manufacturing, which has been published on 25th March 2019.



The participating bodies from Austria, France, Germany, Israel, Poland, Switzerland and the United Kingdom have launched the joint call for proposals Photonics for advanced manufacturing, which intends to fund joint research and development in the area of photonics. Applicants are expected to undertake research aiming at marketable products, services or technologies with high market potential in the participating countries and/or Europe. This call will be administered under the regulations of the intergovernmental EUREKA network.

Photonic technologies to be investigated particularly include (but are not limited to):

Laser machining, additive manufacturing, selective laser sintering, photonic curing, optical process control / process analytical technology (PAT), 3D optical sensing and imaging incl. spectral and hyperspectral imaging, millimeter wave imaging and lidar, lithography (photo-, stereo-, laser-based).

Industry sectors addressed particularly include (but are not limited to):

Electronic and computer components, electro-mechanical engineering, transportation and automotive manufacturing including for sport competition, aviation/aerospace, material, chemical and pharmaceutical industry, food control industries, safety and quality engineering and manufacturing technologies.

This initiative continues the cooperation within the Photonics21 Mirror Group comprising research funders in the field of photonics in Europe (including associated countries) who in the past jointly implemented a number of transnational calls under the ERA-Net / Cofund scheme of the EC research framework programmes.

Further information on the call is available on the Photonics21 website www.photonics21.org/news/.

Communication

European photonics success and impact stories

a. Preparation of European photonics success and impact stories

Photonics21 provides a central dissemination service to H2020 Photonics KET (PPP) projects. Topics are selected according to the expected impact of the project on a specific end-user industry and the assumed interest of the general public. By engaging with a professional public relation agency specialised in technology and science communication, the stories get professionally edited and distributed with appealing graphics to increase the chance of uptake by target media. Close coordination of messaging and content of success stories is done with the project coordinators and the European Commission project officers responsible for the project.

b. Distribution of photonics impact stories to end-user industry trade media

Photonics success and impact stories prepared are distributed to end-user industry trade media representing major photonics markets, such as Automotive News Europe, Medical News Today, etc. The stories promote the respective Horizon 2020 Photonics KET (PPP) projects to end-user industry in order to trigger collaboration.

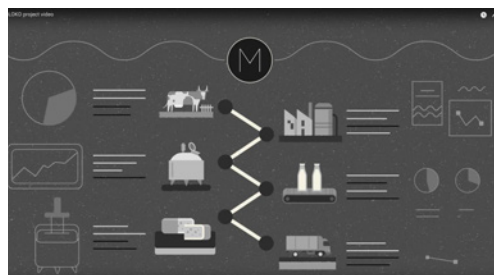
c. Distribution of photonics impact stories to international opinion forming media

Photonics success and impact stories are distributed to international renowned public opinion forming media and websites having a broad readership. Target media include *The Times*, *The Independent*, *Daily Mail*, *Yahoo.com*, *MSN.com*.

Overview on 2018 Press releases of PPP Projects:

Headline	H2020 Photonics PPP Project
New patrolling robots to eradicate petrol plant explosions	REDFINCH
Photonics to help dairy industry with new 5-minute scan	MOLOKO
EU Scientists harness photonics to develop faster, high capacity, low power internet network that never hangs	PASSION
New deadly-bacteria detector to prevent water companies from closure	WaterSpy
Scientists develop laser fabric that cures skin diseases	PHOS-ISTOS

Source: VDI TZ GmbH.



Photonics21 Project Moloko –
Screenshot of the project video
Source: www.youtube.com/watch?v=gd1jgey_QSY



Photonics21 Project Poseidon –
Screenshot of the project video
Source: www.youtube.com/watch?v=ysLu5MQA-fE

Further news arising from the projects themselves were then distributed to the photonics community through the Photonics21 dissemination channels website, newsletter, LinkedIn and Twitter.

Campaign Review 2018:

Key Indicators:

- 217 articles (117 End User Media)
- global readership of over 19.9 million people
- advertising value totalling +€420K
- Science, Technology, Medical, Health, Electronics among most popular sectors

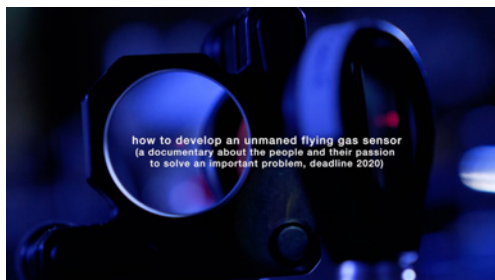
Photonics Campaign Objectives

To promote photonics technology and its community of industry and research

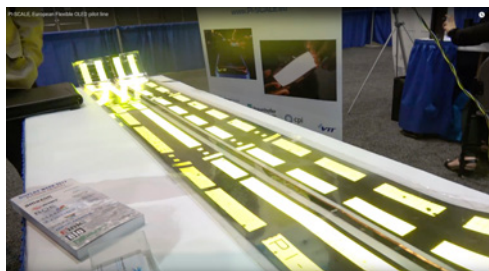
Quick facts: Media coverage of the 8 identified stories for 2018

Matter PR code	Project name	Press release	Articles	Photonics	End user media	News	Unique monthly	Refined readership
18 P01	Vision Paper	Photonics to create 1 million new jobs by 2030	13	6	5	2	2,855,739	50,995
18 P02	PHOS-ISTOS	Scientist develop Laser Fabric that cures skin disease	88	3	44	41	278,977,547	11,607,575
18 P03	Annual Meeting	Summit to show photonics vital to digitization of industry	5	3	2	0	311,410	5,977
18 P04	MOLOKO	Photonics to help dairy industry with 5-minute scan	12	5	6	1	838,520	93,169
18 P05	WATERSPY	New deadly bacteria detector to prevent water companies from closure	15	5	8	2	388,080	69,017
18 P06	REDFINCH	Laser speed to spot gas leaks on oil refineries	26	3	21	2	2,789,290	309,921
18 P07	PASSION	Light speed internet to enable smart cities	41	9	21	11	74,745,802	6,795,073
18 P08	LUMENTILE	New photonic tiles to turn bathroom wall into cinema screens	17	4	10	3	6,745,240	1,053,944
Totals			217	38	117	62	367,651,628	19,985,671

Source: MatterPR.



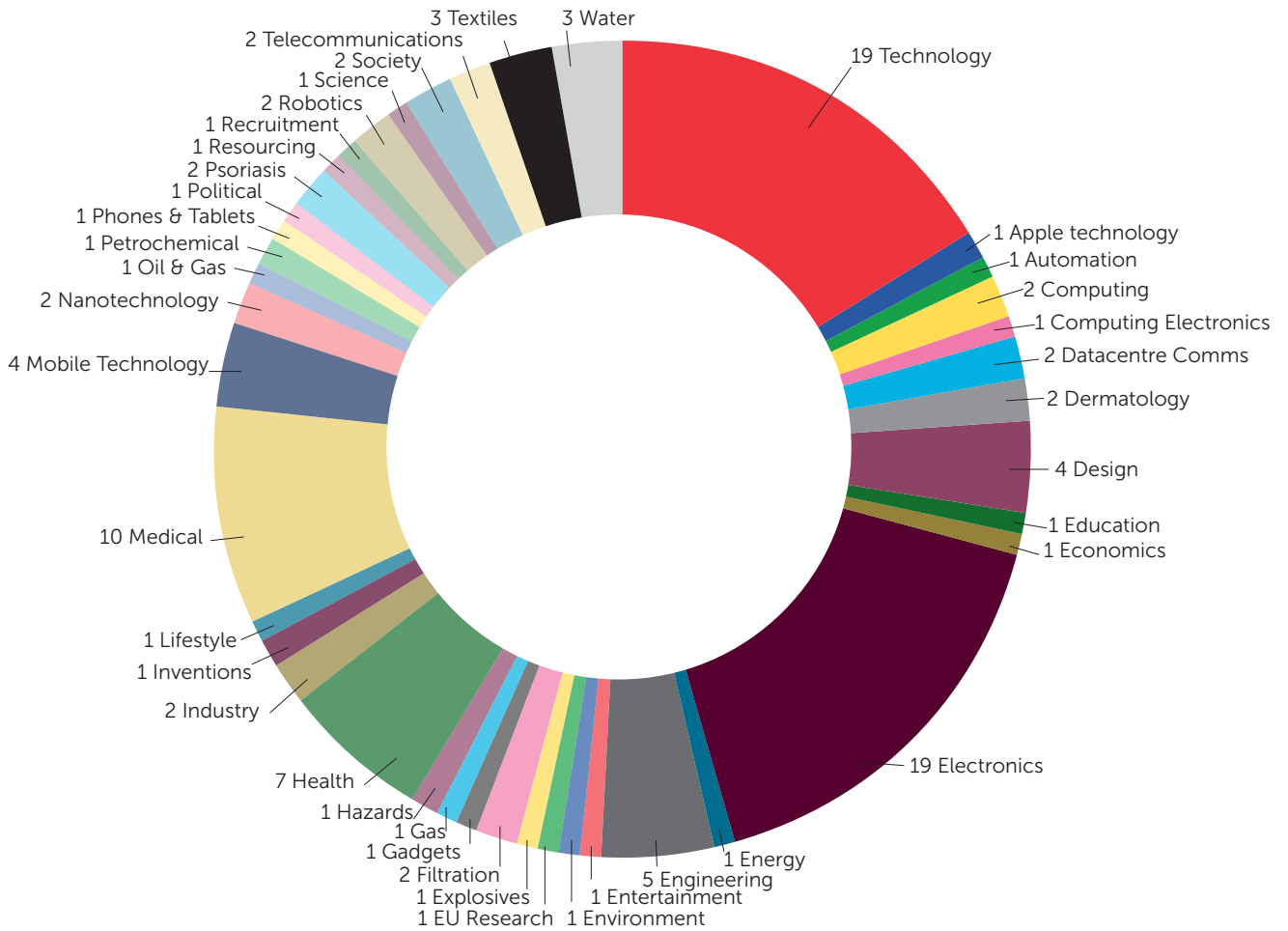
Photonics21 Project Flair –
Screenshot of the project video
Source: <https://vimeo.com/278277667>



Photonics21 Project Pi-Scale –
Screenshot of the project video
Source: www.youtube.com/watch?v=MuPdy1kiTYI

End User Media Breakdown

In keeping with the strategy to promote photonics outside of the community of light, of the 217 articles produced, 117 are in end user media publications.



Source: MatterPR.

In total four videos were created in 2018 (3 released at the time of writing) which have boosted the photonics media coverage:

- **PHOS-ISTOS** (Lyon, France)
- **PASSION** (Milan, Italy)
- **LUMENTILE** (Pavia, Italy)

Click [links](#) for videos



Photonics21 Project PHOS-ISTOS –
Screenshot of the project video
Source: <https://vimeo.com/272628658>



Photonics21 Project PASSION –
Screenshot of the project video
Source: <https://vimeo.com/280722300>



Photonics21 Project LUMENTILE –
Screenshot of the project video
Source: <https://vimeo.com/280722300>

Matter PR code	Project name	Press release	Articles	Photonics	End user media	News	Unique monthly	Refined readership
18 P02	PHOS-ISTOS	Scientist develop Laser Fabric that cures skin disease	88	3	44	41	278,977,547	11,607,575
18 P07	PASSION	Light speed internet to enable smart cities	41	9	21	11	74,745,802	6,795,073
18 P08	LUMENTILE	New photonic tiles to turn bathroom wall into cinema screens	17	4	10	3	6,745,240	1,053,944
Totals			146	16	75	55	360,468,589	19,456,592

Source: MatterPR.

Annex: Overview on funded Photonics PPP projects

Call	Project acronym	Project #	Funding scheme	Link / Website	Project start	Project end
H2020-ICT-2017-1	3PEAT	780502	RIA	http://ict-3peat.eu/	01.01.2018	31.12.2020
FP7-ICT-2013-11	Actphast / FP 7	619205	CP	www.actphast.eu/	01.11.2013	31.10.2017
H2020-ICT-2017-1	ACTPHAST 4.0	779472	IA	www.actphast.eu/	01.11.2017	31.10.2021
H2020-ICT-2018-2	ACTPHAST 4R	825051	IA	not available	01.01.2019	31.12.2022
H2020-FoF-2014	ADALAM	637045	RIA	http://adalam.eu/	01.01.2015	31.12.2017
FP7-2013-NMP-ICT-FOF	APPOLO	609355	CP	www.appolo-fp7.eu/	01.09.2013	31.08.2017
H2020-ICT-2016-1	AQUARIUS	731465	RIA	https://aquarius-project.eu/	01.01.2017	31.12.2019
H2020-ICT-2018-2	CALADAN	825453	IA	not available	01.01.2019	31.12.2022
H2020-ICT-2014-1	CARDIS	644798	RIA	www.cardis-h2020.eu/	01.02.2015	31.07.2018
H2020-ICT-2014-1	CHEQUERS	645535	RIA	www.chequers.eu/	01.03.2015	31.08.2018
ICT-28a-2015	COBIOPHAD	688448	IA	www.cobiophad.eu/	01.01.2016	31.12.2018
H2020-FoF-2014	COMBILASER	636902	RIA	http://combilaser.eu/	01.01.2015	31.12.2017
H2020-ICT-2014-1	COMPLETE	645568	CSA	http://photonics-complete.eu/	01.01.2015	31.12.2017
ICT 27-2015	COSMICC	688516	RIA	www.h2020-cosmicc.com/	01.12.2015	30.11.2018
H2020-ICT-2018-2	CUSTODIAN	825103	RIA	not available	01.12.2018	30.11.2021
H2020-ICT-2016-1	CVENT	731771	RIA	http://cvent-2020.eu/index.html	01.11.2016	31.10.2019
H2020-ICT-2014-1	DICOMO	643920	RIA	http://dicomo-project.eu/	01.01.2015	31.12.2017
H2020-ICT-2015	DIMENSION	688003	RIA	www.dimension-h2020.eu/	01.02.2016	31.01.2020
H2020-FOF-2016	DREAM	723699	RIA	www.dream-euproject.eu/	01.10.2016	30.09.2019
H2020-ICT-2018-2	ELIOT	825651	IA	not available	01.01.2019	31.12.2021
H2020-FOF-2016	ENCOMPASS	723833	RIA	http://encompass-am.eu/	01.10.2016	30.09.2019
H2020-ICT-2016-1	EPRISE	732695	CSA	https://eprise.eu/	01.01.2017	30.06.2019
H2020-ICT-2016-1	ESOTRAC	732720	RIA	https://www.esotracs2020.eu/	01.01.2017	31.12.2020
H2020-ICT-2018-2	FemtoSurf	825512	RIA	not available	01.01.2019	31.12.2021
H2020-ICT-2016-1	FLAIR	732968	RIA	www.h2020flair.eu/	01.11.2016	31.10.2019
H2020-ICT-2014-1	FLEXOLIGHTING	644272	RIA	www.flexolighting.eu/	01.01.2015	31.12.2017
H2020-ICT-2016-1	GALAHAD	732613	RIA	http://galahad-project.eu/	01.12.2016	30.11.2019
H2020-ICT-2015	HAMLET	688750	RIA	www.ict-hamlet.eu/	01.12.2015	30.11.2018
ICT 27-2015	HIPERDIAS	687880	RIA	www.hiperdias.eu/	01.02.2016	31.07.2019
H2020-FOF-2016	HIPERLAM	723879	RIA	https://www.hiperlam.eu/	01.11.2016	31.10.2019
H2020-ICT-2016-1	HYPOSENS	732794	RIA	http://hyposens.eu/	01.11.2016	31.10.2019
H2020-FOF-2016	HYPROCELL	723538	IA	www.hyprocell-project.eu/	01.11.2016	31.10.2019
H2020-ICT-2014-1	I-ALLOW	645262	RIA	http://i-allow.eu/	01.01.2015	30.04.2017
ICT 27-2015	ICT-STREAMS	688172	RIA	www.ict-streams.eu/	01.02.2016	31.01.2019
H2020-ICT-2017-1	IMCUSTOMEYE	779960	IA	www.imcustomeye.eu/	01.01.2018	31.12.2021
ICT-28a-2015	INNODERM	687866	IA	http://innoderm2020.eu/	01.03.2016	28.02.2021
H2020-ICT-2018-2	InPulse	824980	IA	www.inpulse.jeppix.eu/	01.01.2019	31.12.2022
H2020-ICT-2014-1	INSPECT	644483	RIA	www.inspect2020.eu/	01.01.2015	31.12.2017

Call	Project acronym	Project #	Funding scheme	Link / Website	Project start	Project end
H2020-ICT-2018-2	kW-flexiburst	825246	RIA	not available	01.01.2019	31.12.2022
ICT 27-2015	L3MATRIX	688544	RIA	http://l3matrix.eu/	01.12.2015	30.11.2018
H2020-ICT-2018-2	LAMPAS	825132	RIA	not available	01.01.2019	31.01.2021
FP7-2013-NMP-ICT-FOF	Lashare	609046	CP	www.lashare.eu/	01.09.2013	31.08.2017
H2020-ICT-2016-1	LEDLUM	731466	RIA	https://ledlum-project.eu/	01.11.2016	31.10.2019
H2020-ICT-2014-1	Light2015	644964	CSA	www.europe.light2015.org/	01.01.2015	30.06.2016
H2020-ICT-2014-1	LOMID	644101	RIA	www.lomid.eu/	01.01.2015	31.12.2017
ICT-28a-2015	LUCA	688303	IA	http://luca-project.eu/	01.01.2016	31.01.2020
H2020-ICT-2014-1	LUMENTILE	644902	RIA	www.lumentile-project.eu/	01.03.2015	28.02.2018
H2020-FOF-2016	MAESTRO	723826	RIA	www.maestro-project.eu/	01.10.2016	30.09.2019
H2020-FoF-2014	MASHES	637081	RIA	www.mashesproject.eu/	01.12.2014	30.11.2017
H2020-ICT-2018-2	MASSTART	825109	IA	not available	01.01.2019	31.12.2021
H2020-ICT-2017-1	MERLIN	780989	IA	not available	01.12.2017	30.11.2020
H2020-ICT-2017-1	MILEDI	779373	RIA	www.miledi-h2020.eu/	01.01.2018	30.06.2021
H2020-ICT-2017-1	MIRACLE	780598	IA	miracleproject.eu/	01.01.2018	30.06.2021
H2020-ICT-2014-1	MIREGAS	644192	RIA	www.h2020-miregas.eu/	01.01.2015	31.12.2017
ICT 28 b-2015	MIRPHAB	688265	IA	www.mirphab.eu/	01.01.2016	31.12.2019
H2020-FOF-2016	MODULASE	723945	IA	www.modulase.eu/	01.09.2016	31.08.2019
H2020-ICT-2017-1	MOICANA	780537	RIA	not available	01.01.2018	31.12.2020
H2020-ICT-2017-1	MOLOKO	780839	IA	www.moloko-project.eu/	01.01.2018	30.06.2021
H2020-ICT-2016-1	MOON	732969	RIA	https://moon2020.meduniwien.ac.at/	01.11.2016	31.10.2020
H2020-ICT-2017-1	MORPHIC	780283	RIA	not available	01.01.2018	30.06.2021
H2020-ICT-2018-2	MultiFlex	825201	RIA	not available	01.01.2019	31.12.2021
H2020-ICT-2018-2	MULTIPOINT	825567	RIA	not available	01.01.2019	31.12.2021
H2020-ICT-2017-1	NEXIS	780026	IA	not available	01.01.2018	31.12.2020
H2020-ICT-2015	OCTCHIP	688173	RIA	www.octchip.researchproject.at/	01.01.2016	31.12.2019
H2020-ICT-2014-1	OPENAIS	644332	IA	www.openais.eu/	01.01.2015	31.12.2017
H2020-ICT-2016-1	PAMMOTH	732411	RIA	www.pammoth-2020.eu/	01.01.2017	31.12.2020
H2020-FOF-2016	PARADDISE	723440	RIA	www.paraddise.eu/	01.10.2016	30.09.2019
H2020-ICT-2017-1	PASSION	780326	RIA	www.passion-project.eu/	01.12.2017	30.11.2020
H2020-ICT-2016-1	PHABLABS 4.0	731610	CSA	www.phablabs.eu/	01.12.2016	31.05.2019
H2020-ICT-2014-1	PHEBE	641725	RIA	www.h2020-phebe.eu/	01.02.2015	31.08.2018
H2020-ICT-2017-1	PHENOMENON	780278	RIA	www.phenomenonproject.eu/	01.01.2018	31.12.2020
CIP-ICT-PSP-2013-7	Phos-Istos	621103	PB – Pilot Type B	www.phosistos.com/	01.12.2013	30.11.2017
H2020-ICT-2014-1	Photonics4All	644606	CSA	http://photonics4all.eu/	01.01.2015	31.12.2016
ERANET COFUND 2015	PhotonicSensing	688735	CSA	https://photonicsensing.eu/	01.04.2016	31.03.2021
H2020-ICT-2016-1	PICCOLO	732111	RIA	www.piccolo-project.eu/	01.01.2017	31.12.2019
H2020-ICT-2015	PICs4All	687777	CSA	www.pics4all.jeppix.eu/	01.01.2016	31.12.2018

Call	Project acronym	Project #	Funding scheme	Link / Website	Project start	Project end
H2020-ICT-2017-1	PICTURE	780930	RIA	not available	01.01.2018	31.12.2020
H2020-ICT-2015	PI-SCALE	688093	IA	http://pi-scale.eu/	01.01.2016	31.12.2018
H2020-ICT-2015	PIX4LIFE	688519	IA	www.pix4life.eu/	01.01.2016	31.12.2019
H2020-ICT-2016-1	PIXAPP	731954	IA	https://www.pixapp.eu/	01.01.2017	31.12.2020
H2020-ICT-2017-1	plaCMOS	780997	RIA	not available	01.12.2017	30.11.2020
H2020-ICT-2015	PLASMOfab	688166	RIA	www.plasmofab.eu/	01.01.2016	31.12.2018
H2020-FOF-2016	POLAROLL	723805	IA	www.polaroll-project.eu/	01.10.2016	30.09.2019
H2020-ICT-2014-1	POSEIDON	644669	RIA	www.poseidonproject.eu/	01.01.2015	31.12.2017
H2020-ICT-2018-2	PROMETHEUS	825503	RIA	not available	01.01.2019	31.12.2021
H2020-ICT-2018-2	PULSE	824996	RIA	not available	01.01.2019	31.12.2022
H2020-ICT-2017-1	QAMeleon	780354	RIA	https://ict-qameleon.eu/	01.01.2018	31.12.2021
H2020-FoF-2014	RADICLE	636932	RIA	http://radiclelaser.eu/	01.02.2015	31.01.2018
H2020-ICT-2014-1	RAIS	644956	RIA	www.rais-project.eu/	01.01.2015	31.12.2017
H2020-ICT-2017-1	REDFINCH	780240	RIA	www.redfinch.eu/	01.12.2017	31.05.2021
ICT-28c-2015	RespiceSME	687961	CSA	www.respice-sme.eu/	01.01.2016	31.12.2017
H2020-ICT-2014-1	SAPHELY	644242	RIA	https://saphely.eu/	01.02.2015	31.01.2018
H2020-ICT-2014-1	SEERS	645114	RIA	www.seersproject.eu/	01.02.2015	31.01.2018
H2020-ICT-2016-1	SOLUS	731877	RIA	www.solus-project.eu/	01.12.2016	30.11.2020
ICT 27-2015	Teraboard	688510	RIA	www.teraboard.eu/	01.12.2015	30.11.2018
H2020-ICT-2018-2	TERIPHIC	825502	IA	not available	01.01.2019	31.12.2021
H2020-ICT-2015	TRESCLEAN	687613	RIA	www.tresclean.eu	01.04.2016	30.09.2019
ICT 27-2015	ultraSURFACE	687222	RIA	www.ultrasurface.eu/	01.01.2016	31.12.2018
H2020-ICT-2016-1	VOSTARS	731974	IA	www.vostars.eu/	01.12.2016	30.11.2019
H2020-ICT-2016-1	WATERSPY	731778	RIA	waterspy.eu/	01.11.2016	31.10.2019
H2020-ICT-2015	WIPE	688572	RIA	http://wipe.jeppix.eu/	01.01.2016	31.12.2018

