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Deliverable 2.4

Analysis of penetration of photonics in two inter-sectoral business case studies, stimulated by value chain analyses, following on-line and face-to-face brokerage

Deliverable Name	Analysis of penetration of photonics in two inter-sectoral business case studies, stimulated by value chain analyses, following on-line and face-to-face brokerage.
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Deliverable Author	Sergio Sáez (SECPhO); Samantha Michaux (S2i)

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PU	Public	X
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	





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1. Introduction

The objective of the RespiceSME project is to reinforce the innovative capacity of Europe's photonics Small and Medium Enterprises (SMEs), clusters and national platforms by stimulating targeted collaborations in and beyond photonics.

The main objective of the Work Package (WP) 2 is creating broader technological applications and innovations of photonics throughout different sectors of strength in Europe. Activities in WP2 will target the photonics sector and its potential to significantly leveraging non-photonics sectors such as Environment / Energy, Transport and Manufacturing – thereby enabling the penetration of new markets and / or new application areas close to markets.

Within WP2, the task 2.3 focuses on identifying the potential for new business opportunities between EU regions based on interdisciplinary applications of photonics. At the operational level, a cross-sectoral cluster meeting was organised to initiate new collaboration opportunities in application fields such as Manufacturing, Energy/Environment and Transport.

2. Cross-sectoral Meeting

The *Cross-Sectoral Meeting* was organised on October 3rd, 2017, during the Internet of Things Solutions (IoT) World Congress in Barcelona (Spain). To achieve it, the whole consortium deeply worked in the organisation and involvement of SMEs and organisations close to Photonics and the target markets of the RespiceSME project: Energy & Environment, Transport and Manufacturing. The meeting was set in order to foster collaborations between photonics and the other markets (either *intra* or *inter* relations), aligned with the project goals.

2.1 Aim of the meeting

The inter-sectoral meeting gathered photonics clusters, other clusters from other industrial fields (ICT, Energy, Manufacturing, Automotive, etc.) and national platforms from non-photonics sectors. The purpose was to poll the opinions on the innovative potential of photonics technologies in specific non-photonics domains such as Energy /Environment, Transport, and Manufacturing. A particular challenge in this task was to get the appropriate engagement of key representatives of clusters and platforms in these other sectors. This is the reason why the consortium decided to organise the workshop during the flagship event 'IoT World Congress' since the IoT market involves representatives from all photonics application markets (optical communications, optoelectronics and many other photonics technologies are the hardware behind IoT) addressed in the project.

2.2 Organisation

The preparation of the event started in March 2017, when SECPhO met the organisers of the IoTSWC in Barcelona, establishing a partnership that allowed the use of their rooms and collaboration with the congress.

The first version of the agenda was defined in July 2017, after the 2nd *Photonics Clusters Meeting*. Due to the success generated with the Business Cases and the Mapping Sessions at the 2nd Photonics Cluster Meeting, the consortium decided to repeat the methodology in the *Cross-Sectoral Meeting*,



extending it from 1 topic (Automotive in Munich) to 3 topics (Energy & Environment, Transport and Manufacturing). The partners started then to invite speakers and attendees.

The photonics community, as well as the 3 sectors involved in the meetings were addressed as follows.

- **Photonics Clusters:** the consortium partners used their contact lists to reach them through direct mailing, website, social networks and personal phone calls.
- **Photonics SMEs:** the consortium partners contacted their companies, mainly those ones having a potential in the 3 application markets.
- **Exhibitors:** Before the meeting and during the exhibition, the consortium also reached companies already attending the trade fair in order to invite them to the meeting. This way, companies out of the consortium partners' contacts were reached; for example companies out of the European scope. The consortium used a flyer in order to attract those additional potential participants (attached in the annexes list).
- **Other clusters:** clusters related to the application markets were also contacted, mainly coming from previous collaborations with RespiceSME members, allowing involving some of these clusters and their companies to the event.

Moreover, the consortium partners were also involved in the organisation of the meeting in **content providing** and **getting speakers**. Content providing was very important because the consortium created *Collaboration Cards* used during the meeting, as it will be explained in the section *Meeting Description*.

2.3 Target groups

After a short presentation of the project, some success stories of photonics in the field of 'Internet of Things', the event was divided in 3 main blocks combining a general presentation of the potential of photonics in the dedicated application field, business cases from SMEs and Mapping collaboration opportunities along the different value chains analysed in the project:

1. The first block focused on Photonics in the field of Energy & Environment
2. A second block focused in the analysis of photonics in automotive and transport
3. A third block addressed the field of Manufacturing.

The meeting mainly addressed photonics and target markets' SMEs and clusters. In order to attract SMEs from the other sectors, **non-photonics clusters were invited** to participate and disseminate the information about the event amongst their members. Some examples of clusters who collaborated were:

- **CWP** – Catalan Water Partnership | Energy & Environment
- **Railgrup** – Spanish Rail Cluster | Transport
- **CEEC** – Catalan Efficient Energy Cluster | Energy & Environment
- **E-mobil BW** – Regional Agency for electric Mobility in Baden-Württemberg (Germany) | Automotive
- **microTEC SüdWest** – German Cluster for intelligent microsystems technologies | Energy & Environment

From these connections, we had 2 speakers in the workshop:

- **ADASA Sistemas.** Company from the water sector.
- **INHISET.** Company from the rail sector.

From the manufacturing sector, **Atten2**, which is also member of SECPhO made a presentation.

2.4 Meeting description

2.4.1 Introduction & presentation of RespiceSME

Samantha Michaux, as a project coordinator, presented the RespiceSME project and its 3 dimensions:

1. Enabling the innovation potential of high-tech photonics SMEs
2. Stimulating business collaborations in and beyond photonics
3. Strengthening innovation capacities for value creation in SMEs

Samantha also wanted to mark the outputs being generated within this project. The expected outcomes after the project are:

- Strengthened role of clusters and networks as facilitators for SMEs;
- Value creation for SMEs in terms of number of business collaborations stimulated, penetration of new markets and/or new application areas close to market;
- Successful exploitation of Best Practices in and beyond photonics



2.4.2 Success stories of Photonics in the IOT Industry

Before entering each of the RespiceSME's target markets, we decided to give a change to show real cases of photonics companies working in the IOT Industry, since the event was held in the framework of the Internet of Things Solution World Congress in Barcelona. Moreover, IOT is an emerging field with increasing importance and influence on the society and hence, knowing cases of photonics there is a good chance.

In this section, the presentations were:

- **Markus Kohlbacher**, t-matix (Austria) - *An IoT Platform as Innovation Enabler*
- **Jörg Reiterrer**, TriLite Technologies (Austria) - *Microprojectors for IoT devices*



2.4.3 Cross sectorial blocks

2.4.3.1 Overview of photonics in each sector

Cluster members that are experts in each of the topics presented the different blocks of the event presented the potential of photonics in each of the addressed target market:

- **Lennart BM Svensson**, PhotonicSweden (Sweden) - *Overview of Photonics applications in Energy and Environment*
- **Paul Stefanut**, OpticsValley (France) - *Overview of Photonics applications in Transport*
- **Gerard O'Connor**, NUI Galway (Ireland) - *Overview of Photonics applications in Manufacturing*

Those presentations introduced each of the topics, taking a broad view of the photonics technologies that are behind each of the topics, showing the state of the art, and the perspectives on them.

2.4.3.2 Business cases

As a consortium, we consider that business cases of photonics applications are very important to show how a new technology such as photonics can succeed in traditional sectors as the ones addressed by the workshop. Following this consideration, we invited many companies to present their cases in every application market.

Energy and Environment

- **Sergio Martínez**, Leitat (Spain) - *Optical solution for microplastics detection on marine environment*
- **Miquel Pujadas**, Adasa Sistemas (Spain) - *Light applications in Online Water Quality measurement*
- **Johann Koinegg**, Green Tech Cluster Styria (Austria) - *Cooperation opportunities with Styrian photonics companies*
- **Andreas Stubenberger**, ecoliGhts (Austria) - *Solar lightning by ecoliGhts: secure the future and reduce costs*

Transport

- **Tanja Arzberger**, Silicon Alps (Austria) - *High-Tech Network in the South of Austria*
- **Sara Calomarde**, AMS technologies (Spain) - *Optical racks for sensing applications*

Manufacturing

- **Eneko Gorritxategi**, Atten2 (SME, Spain) - *Oil monitoring sensor*
- **Rogério Nogueira**, WATGRID (SME, Portugal) - *From research in photonics to a IoT/Industry 4.0 company*
- **Perez Pelage**, Viaccess-Orca (SME, France) – *Challenges of 3D printing*
- **Giacomo Benvenuti**, 3D Oxides (SME, France) - *Micro and nano 3D and 4D-printing of multifunctional thin film materials*

- **Michael Beising**, EVT Eye Vision Technology GmbH (SME, Germany) - *Machine Vision: key factor for industrial manufacturing*

2.4.3.3 Mapping session

Similar to the second *Photonics Clusters Meeting*, the consortium organised a *Mapping Session*. This session consisted in mapping collaboration opportunities along the value chains with *Collaboration Cards* gathering companies and other stakeholders from every consortium partners who provided information of their SMEs and organisations with business in the application fields addressed and from the registrations at the event.

The *Collaboration Cards* look as follows:



Two different kind of cards were prepared. The first one having a logo of a cluster at the top-right corner, while the other not, showing that the first company was represented by a Photonics Cluster (i.e. its Cluster Manager) at the event, while the other one was represented by themselves at the event. Beyond that, the core technology and the origin country were also shown in those cards.

Regarding the *Maps*, we created 3 *Maps* oriented to show the Photonics Value Chain for each of the target markets. We defined a detailed value chain to involve all kind of stakeholders from the idea or research to the market:

R&D | Technology Transfer | Component manufacturing | modules manufacturing | Systems manufacturing | Engineering & Integration | Distribution

We used 3 different *Maps*:

Map 1. Value Chain of Photonics technologies applied to Energy & Environment

The aim of this map was to identify the collaboration opportunities between cluster members, mainly SMEs, in different areas of the chosen markets: Energy & Environment. To identify these areas, SECPhO (Task leader) contacted some of his members in order to identify these areas following their experience. The areas selected were:

- Energy efficiency
- Biomass
- Biogas
- Photovoltaic technology
- Wind Power

- Safety, maintenance & energy rehabilitation
- Drinking water quality
- Industrial water quality

Map 2. Value Chain of Photonics technologies applied to Transport

Similar purpose as for Map 1, Map 2 focuses on photonics technologies applied to manufacturing of vehicles, but also to the equipment of vehicles. Again, the consortium used the experience of cluster members to identify specific market applications. They were divided into two types of end markets:

SMART MOBILITY & CONNECTED TRANSPORT

- Sensing & Imaging
- Connectivity
- Screens & projectors
- Advanced Lighting

CAR, TRAIN, AIRPLANE MANUFACTURING

- Laser Systems
- Sensing & Imaging
- Connectivity

Map 3. Value Chain of Photonics technologies applied to Manufacturing

The third and last *Map* is about the application potential of photonics technologies for manufacturing. Again, we used the experience of cluster members to identify specific market applications. In this case, the decision was to focus the value chain towards different types of applications in manufacturing. The applications selected were:

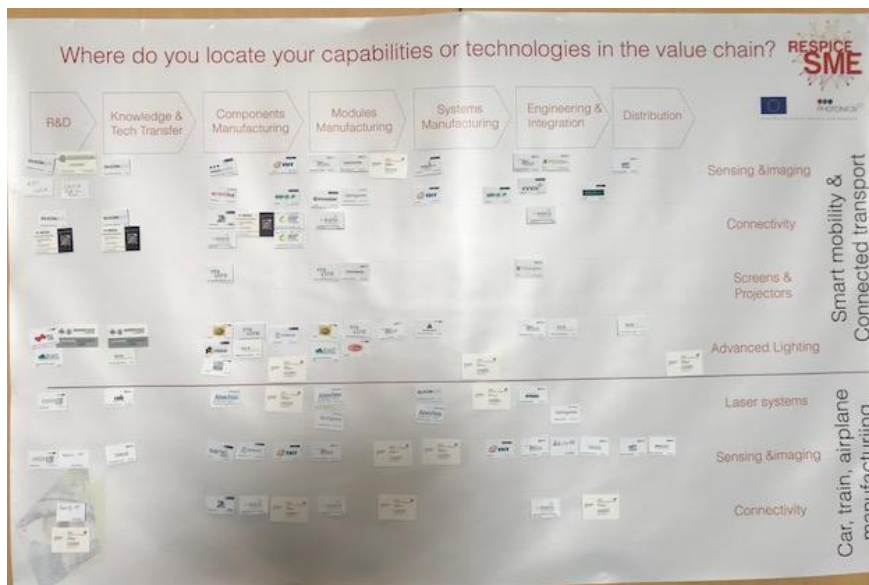
- Automation
- Quality Control
- Laser cutting & welding
- Additive manufacturing & 3D printing
- Computer vision & augmented reality
- Metrology & inspection
- Chemical analysis
- Micromachining & nanofabrication

During the 3 mapping sessions, there was enough time to handle informal networking meetings in different parts of the room.



Photos by Lennart BM Svensson

The participants showing the SME's expertise along the value chain filled each *Value Chain Map* with their *Collaboration Cards* at the end of each block session.





2.5 Follow-up activities

Following the end of the workshop, the consortium started working in analysing the maps and preparing the information for generating as much connections as possible between SMEs.

The tasks developed were:

1. Invite SMEs to fill in Business/Technology profiles (cf. T1.3) depending on their interests: Offering/Requesting technology/business opportunities or collaborating in H2020 projects.
2. Analyse the maps in order to detect possible matchings between SMEs along the value chain, putting in contact those who are doing technology transfer with manufacturers and manufacturers with integrators and distributors.
3. After having the couples of SMEs, connecting them using the clusters as a bridge for facilitating a warm connection.



The mapping results were analysed in detail to find out the hidden opportunities. Three collaboration maps (see in Annex) were thus created to facilitate this analysis:

- Map analysis Energy & Environment
- Map Analysis Transport
- Map Analysis Manufacturing

2.6 Participants

The *Cross-Sectorial Meeting* involved many participants that can be split in three groups:

- **Photonics Clusters/Platforms:** Silicon Alps Cluster GmbH (Au), Green Tech Cluster Styria GmbH (Au), Optitec (Fr). Reached **3 photonics clusters**, in total **13 photonics clusters/platforms** when including the consortium members.
- **Photonics SMEs:** Lumitech (Au), Organic Electronic Technologies (Gr), ecoLights Solare Beleuchtung GmbH (Au), TriLite Technologies GmbH (Au), Fibrepulse Limited (Ir), 3D Oxides (Fr), Atten2 (Es), t-matix solutions (Au), Adasa (Es), Eye Vision Technologies GmbH (Ge), Viaccess-Orca (Fr), AMS Technologies (Es), WATGRID (Po), Vivagestur (Es). In total, up to **14 Photonics SMEs**.
- **Other photonics-related organisations and centres:** Leitat (Es), Nanotechnology Lab – LTFN (Gr), Insitut Químic de Sarrià (Es), Universitat Politècnica de Catalunya (Es). Up to **4 organisations and centres**.

Overall, the *Cross Sectorial Meeting* reached the involvement of **31 different organisations**.

2.7 Lessons learned

Some criteria have been analysed in order to evaluate the real impact of the event:

- ❖ **Communication.** Similar as for the second *Photonics Cluster Meeting*, the methods used for the event communication were direct mailing, social networks, websites and direct phone calls. The actions were successful although personal contact between the cluster manager and the SME showed to be the best way to ensure a successful communication!
- ❖ **Topic.** The diversity of the topics addressed in the meeting attracted multidisciplinary participants. Moreover, all *Mapping Sessions* were filled with many companies (see annex Mapping Results) showing the right decision to represent all the topics in the workshop.
- ❖ **Involvement of SMEs.** The business-oriented focus of the event as well as the networking fostered by the *Mapping Sessions* was very attractive for the SMEs and many of them attended the event. However, the number of SMEs was not as high as expected. The reasons for that were manifold; first, the 3rd of October was a non-working day in Germany (*Tag der Deutschen Einheit*) and only one German company managed to attend the event. Second, the framework exhibition was not a pure photonics one, but focussed on IoT (Internet of Things). Finally, due to the strikes regarding the political situation in Catalonia, most Spanish companies cancelled their attendance on last minute (both speakers and attendees). Additionally, because the event took place on the first day of the exhibition (only day with available room) many exhibiting companies could not attend as they were dealing with their own booth business.
- ❖ **Select a good environment.** Although the Internet of Things Solutions World Congress was not a photonics event, it was interesting for many companies since IoT a significant trend for the photonics business considering the high potential of application.



2.8 List of annexes

- 1) Event flyer;
- 2) Event agenda;
- 3) Participant list;
- 4) Mapping designs
- 5) Mapping results

1) Flyer



LIGHT TECHNOLOGIES IN TRANSPORT, MANUFACTURING, ENERGY & ENVIRONMENT

SUCCESS STORIES ON CROSS SECTORIAL INNOVATION

Internet of Things Solutions World Congress
Av. Joan Carles I, 64 - Halls 4 & 5 - Room 1.4 - Fira Barcelona



AGENDA

9.00 - Welcome

Sergio Sáez, SECPhO (Spain)

9.05 - The RespiceSME project

Samantha Michaux, Steinbeis 2i GmbH, RespiceSME coordinator (Germany)

9.10h - Success stories of Photonics in the IOT Industry

Markus Kohlbacher, t-matix (SME, Austria)
Jörg Reiterer, TriLite Technologies (SME, Austria)

Block 1: Photonics & Energy/Environment

9.30h - Overview of Photonics applications in Energy/Environment
Lennart BM Svensson, PhotonicSweden (Sweden)

9.35h - Business cases

Sergio Martínez, Leitao (RTO, Spain)
Miquel Pujadas, Adasa Sistemas (SME, Spain)
Johann Koinigg, Green Tech Cluster Styria (Austria)
Andreas Stubenberger, ecoliGhts (SME, Austria)

10.15h - Mapping session

10.30h - Coffee Break

Block 2: Photonics & Transport

11.00h - Overview of photonics applications in transport
Paul Stefanut, OpticsValley (France)

11.05h - Business cases

Carles Oriach, Monocrom (SME, Spain)
Virginia Cruz, INHISET (SME, Spain)
Tanja Arzberger, Silicon Alps (Cluster, Austria)
Sara Calomarde, AMS technologies (SME, Spain)

11.45h - Mapping session

Block 3: Photonics & Manufacturing

12.00h - Overview of photonics applications in manufacturing
Gerard O'Connor, NUI Galway (Ireland)

12.05h - Business cases

Eneko Gorritxategi, Atten2 (SME, Spain)
Rogério Nogueira, WATGRID (SME, Portugal)
Perez Pelage, Viaccess-Orca (SME, France)
Michael Beising, EVT Eye Vision Technology GmbH (SME, Germany)

12.45h - Mapping session

13.00h - Networking session

13.30h - End of the Workshop

2) Agenda



LIGHT TECHNOLOGIES IN TRANSPORT, MANUFACTURING, ENERGY & ENVIRONMENT SUCCESS STORIES ON CROSS SECTORIAL INNOVATION

AGENDA

9.00 - Welcome

Sergio Sáez, SECPhO (Spain)

9.05 - The RespiceSME project

Samantha Michaux, Steinbeis 2i GmbH, RespiceSME coordinator (Germany)

9.10h - Success stories of Photonics in the IOT Industry

Markus Kohlbacher, t-matix (SME, Austria)

Jörg Reitterer, TriLite Technologies (SME, Austria)

Block 1: Photonics & Energy/Environment

9.30h - Overview of Photonics applications in Energy/Environment

Lennart BM Svensson, PhotonicSweden (Sweden)

9.35h - Business cases

Sergio Martínez, Leitat (RTO, Spain)

Miquel Pujadas, Adasa Sistemas (SME, Spain)

Johann Kolnegg, Green Tech Cluster Styria (Austria)

Andreas Stubenberger, ecollGhts (SME, Austria)

10.15h - Mapping session

10.30h - Coffee Break

Block 2: Photonics & Transport

11.00h - Overview of photonics applications in transport

Paul Stefanut, OpticsValley (France)

11.05h - Business cases

Carles Oriach, Monocrom (SME, Spain)

Virginia Cruz, INHISET (SME, Spain)

Tanja Arzberger, Silicon Alps (Cluster, Austria)

Sara Calomarde, AMS technologies (SME, Spain)

12.45h - Mapping session

Block 3: Photonics & Manufacturing

12.00h - Overview of photonics applications in manufacturing

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Rogério Nogueira, WATGRID (SME, Portugal)

Perez Pelage, Viaccess-Orca (SME, France)

Michael Beising, EVT Eye Vision Technology GmbH (SME, Germany)

13.45h - Mapping session

13.00h - Networking session

13.30h - End of the Workshop



3) Participant List

Title	Family name(s), Name	Organisation
Dr.	Louise Jones	KTN
Dr.	Judit Morlà-Folch	Beauty Cluster Barcelona
Dr.	Gonzalez Guerrero	EPIC, European Photonics Industry Consortium
Mr.	Porcar Guezenc	COSINGO
Mrs., Llorente	Diana	Translator specialised in optics (freelance)
Mr.	Esparbé	Institute for High Energy Physics (IFAE)
Mr.	Sobrino	Hamamatsu Photonics
Mr.	Martinez Navas, Sergio	LEITAT
Mr.	Steve	stelth
Mr.	Eneko Gorritxategi	Atten2 Advanced Monitoring Technologies
Mr.	Braun, Mario	Lumitech
Mrs.	Michaux, Samantha	Steinbeis 2i GmbH
Dr.	Konstantaki, Mary	FORTH-IESL
Mr.	Camps, David	SECPhO
Dr.	Reitterer, Jörg	TriLite Technologies GmbH

Dr.	Kohlbacher, Markus	t-matix solutions
Dr.	Pechlivani, Eleftheria-Maria	Organic Electronic Technologies
Mr.	Koinegg Johann	Green Tech Cluster Styria GmbH
Mr.	Awdesh Chetal	Hyperthings
Mrs.	Arzberger, Tanja	Silicon Alps Cluster GmbH
Mrs.	Arzberger, Tanja	Silicon Alps Cluster GmbH
Mr.	Casey, Rory	Fibrepulse Limited
Mr.	Guo, Jun	Baker Street VC
Mr.	Stubenberger, Andreas	ecoliGhts Solare Beleuchtung GmbH
Mrs.	Kleinhanß, Sina	Photonics BW e.V.
Mr.	Pujadas Escorihuela, Miquel	ADASA
Dr.	O'Connor, Gerard	NCLA
Dr.	Ignasi Gómez-Belinchón	Railgrup
Mr.	Faschang Rudolf	Faschang Service & Management GmbH
Dr.	Mc Cabe, Ian	NUIGalway
Dr.	Lennart BM Svensson	PhotonicSweden
Mr.	Beising, Michael	EVT GmbH
Ms	Foivi Logothetidi	Nanotechnology Lab - LTFN
Dr.	Benvenuti Giacomo	3D-Oxides
Mrs.	López, Margarida	TMB
Dr.	Paul STEFANUT	Opticsvalley
Mr.	Eriksonas, Linas	LITEK
Mr.	Yann POULAIN	Opticsvalley
Dr.	Torrents	UPC

4) Mapping results

Map Analysis Energy & Environment

R&D	Knowledge & tech transfer	Components manufacturing	Modules manufacturing	Systems manufacturing	Engineering & Integration	Distribution	
oet (Gr) Lumitech (aus) Joanneum research (PhotAus) Nanotechnology lab LTFN (Gr)	Joanneum research (PhotAus) Nanotechnology lab LTFN (Gr)	ecoLights (aus) Prime laser tech (FORTH) Fiberpulse (NUI) oet (Gr) TriLite (Aus) nanovation (OV)	oet (Gr) TriLite (Aus) Prime laser tech (FORTH) Nanotechnology lab LTFN (Gr) Lumitech (aus)	Adasa (es) oet (gr) Atten2 (es) ecoLights (aus) Lumitech (aus) iris (secpho) ecomasure (OV)	oet (gr) Atten2 (es) Lumitech (aus) Aimen (secpho) AMS (secpho) t-matix (aus) ECO CAN-Light (GTC) Aimen (secpho)	ecoLights (aus) oet (Gr) Ecolan (GTC) LightBooster (GTC)	Energy efficiency
	Aimen (secpho)						Biomass
		nanovation (OV)		Eurecat (secpho)	AMS (secpho)		Biogas
Joanneum Research (Aus) 3D Oxides (fr) oet (Gr) Nanotechnology lab LTFN (Gr)	oet (Gr) Joanneum Research (Aus) Nanotechnology lab LTFN (Gr) EVT (ger)	ExegerAB (Swe) SFC Technologies (GTC) EVT (ger)	MidsummerAB (swe) SFC Technologies (GTC) oet (Gr)	Eurecat (secpho)	ecoLights (aus) SFL technologies (GTC) AMS (secpho)		Photovoltaic technology
		Fiberlaser (NUI) Atten2 (es)		Atten2 (es) Leosphere (OV)	Atten2 (es)		Wind Power
		Fiberpulse (NUI) SensL (NUI)		Atten2 (es)			Safety, maintenance & energy rehabilitation
Adasa (es)		Fiberpulse (NUI)	fluidion (OV)	Adasa (es) fluidion (OV)	Adasa (es) AMS (secpho)	Adasa (es)	Drinking water quality
Adasa (es) WATGRID (por)	WATGRID (por)	Fiberpulse (NUI) WATGRID (por)	WATGRID (por) fluidion (OV)	Adasa (es) fluidion (OV) WATGRID (por) Atten2 (es) Perception Park (GTC) mirsense (OV)	Adasa (es)	Adasa (es)	Industrial water quality

Map Analysis Transport

R&D	Knowledge & tech transfer	Components manufacturing	Modules manufacturing	Systems manufacturing	Engineering & Integration	Distribution		
Silicon Alps (Aus) Hellas-Forth (Gr) RITS INRIA CAOR Ecoles des mines (Fr)	Silicon Alps (Aus)	(NUI) Femtika (LITEK) NIT (OV) SensUp (OV)	AMS (secpho) Hamamatsu (secpho) EVT (ger) Chronocam (OV) Optogama (LITEK)	magellium (OV) NIT (OV) SensUp (OV)	AMS (secpho) Ficosa (secpho) innov (OV) Dibotics (OV)	NIT (secpho)	Sensing & Imaging	SMART MOBILITY & CONNECTED TRANSPORT
Silicon Alps (Aus) 3D Oxides (Fr)	Silicon Alps 3D oxides	Fiberpulse (NUI) 3D Oxides (Fr) t-Matix (Aus) MRG-X (GTC) Dinitech (GTC) KDPOF (SECPhO)	t-matix (Aus)		t-matix (aus)		Connectivity	
		TriLite (Aus)	TriLite (Aus) Hamamatsu (secpho)		Ficosa (secpho)		Screens & projectors	
TU Graz (PhotAus) Nanotechnology LAB LTFN (Gr) oet (Gr)	ecoLights (Aus) Nanotechnology LAB LTFN (Gr)	Hella (PhotAus) TriLite (Aus) ecoLights (Aus) EVT (Ger) Superlum (NUI) Ledmotive (SECPhO) Feasa (NUI) Becom (PhotAus)	Hella (PhotAus) TriLite(Aus) AMS (secpho) oet (Gr) ZKW (PhotAus)	Magna Steyr (PhotAus) EVT (ger)	AMS (secpho) ecoLights (aus)	ecoLights (aus) EVT (ger)	Advanced Lighting	
Joanneum Research (PhotAus)	Ceit (secpho)	Altechna R&D (LITEK) EVT (Ger)	Altechna R&D (LITEK) Optogama (LITEK)	Silicon Alps (Aus) Altechna R&D (LITEK)	Aimen (secpho) Optogama (LITEK)		Laser Systems	CAR, TRAIN, AIRPLANE MANUFACTURING
Joanneum Research (PhotAus) Autoliv (Swe)	Visiona (secpho)	SensL (NUI) Superlum (NUI) NIT (OV)	AMS (secpho) EVT (ger)	EVT (ger) NIT (OV)	AMS (secpho) AutolivAB (Swe) Visiona (secpho)	NIT (secpho) AsorCAD (secpho)	Sensing & Imaging	
Zenuity (Swe) EVT (ger)		Fiberpulse (NUI) t-matix (Aus) EVT (Ger) KDPOF (SECPhO)	t-matix (Aus) EVT (Ger)	t-matix (Aus) EVT (Ger)	t-matix (aus) EVT (Ger)		Connectivity	

Map Analysis Manufacturing

R&D	Knowledge & tech transfer	Components manufacturing	Modules manufacturing	Systems manufacturing	Engineering & Integration	Distribution	
EVT (ger)		Fiberpulse (NUI) t-matix (aus) EVT (ger)	EVT (ger) t-matix (aus)	t-matix (aus)	t-matix (aus)		Automation
EVT (ger) PIMM (OV)		EVK (GTC) EVT (ger) t-matix (aus)	Silicon alps (aus) EVT (ger) t-matix (aus)	Atten2 (es) EVT (ger) EVK (GTC) t-matix (aus) seelab (OV) teratonics (OV)	iris (secpho) Perception Park (GTC) t-matix (aus)		Quality Control
Joanneum Research (PhotAus) PIMM (OV)	Joanneum Research (PhotAus)	Fiberpulse (NUI) Altechna R&D (LITEK) Joanneum Research (PhotAus)	Altechna R&D (LITEK)		AMS (secpho) Femtika (LITEK)		Laser cutting & welding
3D Oxides (Fr) Femtika (LITEK) Joanneum Research (PhotAus) PIMM (OV)	Joanneum Research (PhotAus) Femtika (LITEK)	Joanneum Research (PhotAus) Blueacre (NUI) Femtika (LITEK) EVT (ger)	Blueacre (NUI) Femtika (LITEK) PolyPico (NUI)	Viaccess-orca Silltec (OV) silsef (OV) Femtika (LITEK)			Additive manufacturing & 3D printing
EVT (ger)		TriLite (aus) t-matix (aus) EVT (ger)	TriLite (aus) t-matix (aus) EVT (ger)	SiliconAlps (aus) t-matix (aus) Scortex (OV) EVT (ger) Diota (OV)	SiliconAlps (aus)	EVT (ger)	Computer vision & augmented reality
EVT (ger)		eblana photonics (NUI) Optogama (LITEK) Feasa (NUI) FlipSystemsAB (Swe)		Flir Systems AB (Swe) teratonics (OV) SiliconAlps (Aus) EVT (ger)	EVT (ger) AMS (secpho)		Metrology & inspection
	Adasa	EVK (GTC)		EVK (GTC)	iris (secpho) Perception (GTC)		Chemical analysis
Altechna R&D (LITEK) Joanneum Research (PhotAus) 3D Oxides (Fr) Femtika (LITEK)	Femtika (LITEK)	Femtika (LITEK) Altechna R&D (LITEK)	Femtika (LITEK) Altechna R&D (LITEK) PolyPico (NUI)	Altechna R&D (LITEK) Femtika (LITEK)			Micromachining & nanofabrication