

Samantha Michaux, Tabea Link (Lead authors)

10 Tools to Enable the Innovation Potential of High-Tech Photonics SMEs

A guide for cluster managers and business developers to support technological innovation







Samantha Michaux, Tabea Link (Lead authors) 10 Tools to Enable the Innovation Potential of High-Tech Photonics SMEs



Authors

Samantha Michaux (Steinbeis 2i GmbH),

Tabea Link (Steinbeis 2i GmbH)

Petra Bindig (PhotonicSweden)

Linas Eriksonas (LITEK)

Pierre-Yves Fonjallaz (PhotonicSweden)

Louise Jones (KTN)

Mary Konstantaki (FORTH)

Ian Mc Cabe (NUI Galway)

Gerard O'Connor (NUI Galway)

Julius Pauzolis (LITEK)

Stavros Pissadakis (FORTH)

Sergio Sáez (SECPhO)

Paul Stefanut (Opticsvalley)

Ernst Stelzmann (Photonics Austria)

Lennart Svensson (PhotonicSweden)

Johannes Verst (OptecNet)

Samantha Michaux, Tabea Link (Lead authors)

10 Tools to Enable the Innovation Potential of High-Tech Photonics SMEs

A guide for cluster managers and business developers to support technological innovation







Imprint

© 2018 Steinbeis-Edition

All rights reserved. No part of this book may be reprinted, reproduced, or utilised in any form by any electronic, mechanical, or other means now known or hereafter invented, including photocopying, microfilming, and recording or in any information storage or retrieval system without written permission from the publisher.

Samantha Michaux, Tabea Link, Petra Bindig, Linas Eriksonas, Pierre-Yves Fonjallaz, Louise Jones, Mary Konstantaki, Ian Mc Cabe, Gerard O'Connor, Julius Pauzolis, Stavros Pissadakis, Sergio Sáez, Paul Stefanut, Ernst Stelzmann, Lennart Svensson, Johannes Verst
10 Tools to Enable the Innovation Potential of High-Tech Photonics SMEs. A guide for cluster managers and business developers to support technological innovation

1st edition, 2018 | Steinbeis-Edition, Stuttgart ISBN 978-3-95663-160-3

Layout: Steinbeis-Edition

Cover picture: alexis84/iStock/Thinkstock,

bearbeitet von GOETZINGER + KOMPLIZEN Werbeagentur GmbH

Production: e.kurz+co druck und medientechnik gmbh, Stuttgart

Steinbeis is an international service provider in entrepreneurial knowledge and technology transfer. The Steinbeis Transfer Network is made up of about 1,000 enterprises. Specialized in chosen areas, Steinbeis Enterprises' portfolio of services covers research and development; consulting and expert reports as well as training and employee development for every sector of technology and management. Steinbeis Enterprises are frequently based at research institutions, especially universities, which are constituting the Network's primary sources of expertise. The Steinbeis Network comprises around 6,000 experts committed to practical transfer between academia and industry. Founded in 1971, the Steinbeis-Stiftung is the umbrella organization of the Steinbeis Transfer Network. It is headquartered in Stuttgart, Germany. Steinbeis-Edition publishes selected works mirroring the scope of the Steinbeis Network expertise.

164564-2018-02 | www.steinbeis-edition.de

Table of content

Table of fi	gures	7
List of tab	les	8
	e way to excellence – Innovation capacity building for	9
Chapter 1	: Evaluating and stimulating the innovation potential of high-tech SMEs	. 12
Tool 1:	Benchmark of high-tech SMEs – the PAPRIKA Method	12
Tool 2:	Innovation Audits	18
Tool 3:	Strategy workshop for the development of a Business Innovation Strategy	29
	Assessment of internal factors relevant for innovation management	32
	Analysis of external factors to the company	36
Chapter 2	: From innovation to market – enabling photonics SMEs	
-	to exploit their innovation capacity	. 49
Tool 4:	Assessing opportunities for photonics in a non-photonics fields – The RespiceSME Value Chain Analysis	49
Tool 5:	Stimulating cross-sectorial and international business collaborations	60
Tool 6:	Technology / Business / Knowledge Transfer – Brokerage Events and Business & Technology profiles	67
	Collaboration Corner	
	Structured presentation with keynote speakers and 1-1 sessions	69
	Business & Technology profiles online & dissemination with partners	72

Chapter 3	e: Bridging the "Valley of Death" – Enablers to raise the competitiveness of photonics SMEs 74
Tool 7:	Research as a resource for innovation building – Methodology for easy access to Research and Technology Organisations (RTOs) and SMEs
	Approach75
	Proposed measures to assist SME access to RTOs78
	Spread Information80
	Assist Communication81
	Provide Tools82
Tool 8:	Human capital as resource – Aligning education with innovation84
	Access to skilled personnel through photonics education and training programmes84
	Industry expectations regarding employees' skills84
	Entrepreneurship training programmes86
	Database of education programmes – Access to skilled personnel through photonics education and training programmes87
Tool 9:	Policy support for innovation88
Tool 10	Access to finance91
	Facilitating access to national / regional funding for SMEs96
	Funding programmes of the European Union with relevance for Photonics and Key Enabling Technologies98
	Overview of key European funding programmes
	Description of RespiceSME Consortium
	ferences
Descripti	on of RespiceSME Consortium107

Table of figures

Figure I	: RespiceSME Toolbox	10
Figure 2	e: Excerpt of RespiceSME Innovation Audit Questionnaire	25
Figure 3	: Potential Star Graph	26
Figure 4	: Innovation Coaching Timeline	29
Figure 5	: The Innovation Management Cycle	31
Figure 6	5: Business Life Cycle Assessment	33
Figure 7	': Trend Structure Analysis	37
Figure 8	: BCG Matrix	39
Figure 9	e: Product Life Cycle Analysis	40
Figure 1	0: Technology Portfolio Analysis after Werner Pfeiffer	42
Figure 1	1: Product - Technology Matrix	44
Figure 1	2: Partner Radar	47
Figure 1	3: Product Types	50
Figure 1	4: Keyword tree for product applications	51
Figure 1	5: Stakeholders' specific value proposition	52
Figure 1	6: RespiceSME's TRL assessment	53
Figure 1	7: Innovation Potential Level	54
Figure 1	8: System Model	55
Figure 1	9: S-Curve of adoption	56
Figure 2	0: System Model for Light bulb	56
Figure 2	1: System model for iPhone	57
Figure 2	2: Mapping Session – Value Chain	62
Figure 2	3: Mapping Session – Technology Fields	63
Figure 2	4: Mapping Session – Target Markets	64
Figure 2	5: Collaboration corner format	68
Figure 2	6: Matchmaking Contact Template	69
Figure 2	7: Meeting Mojo Setup Process	71
Figure 2	8: Methodology development approach	76
Figure 2	9: Methodology to facilitate SME access to RTOs	79
Figure 3	0: Type of education sought by employers	85
Figure 3	1: Knowledge considered important by employers	85
_	2: Skills rendered important by employers	
Figure 3	3: Destination panel of EU-funding	99

List of tables

Table 1:	Normalized criterion weights and single criterion scores	17
Table 2:	Table Potential Innovation Index as adapted by RespiceSME	23
Table 3:	Table Business Life Cycle Stages	34
Table 4:	Overview Financing Opportunities for SMEs	93
Table 5:	Private Financing Opportunities	93
	Private Financing Opportunities – Characteristics	
	Table Overview of key EU Funding Opportunities	

Paving the way to excellence – Innovation capacity building for photonics SMEs

Small and medium-sized enterprises (SMEs) are the engine of the European economy. In Europe, 23 million SMEs provide around 75 million jobs and represent 99% of all enterprises. Addressing gaps in terms of access to skills or expertise, resources, infrastructure or technology nevertheless remains a necessity in order to sustain the ongoing positive development. It is therefore important to ensure that conditions and support tools are in place that allow SMEs across the EU to exploit their innovation potential to the fullest.

This is where cluster and network initiatives can come in to play an active role in connecting and bringing together the right stakeholders and in reducing the barriers for collaborative innovations. This not only applies to stakeholders from different industries but also to stakeholders from within the value chain (for example, end-users and developers, or science and industry).

Besides providing an ideal environment for SMEs to best innovate and grow, clusters and networks managers should support the *Innovation Management* of SMEs which is of paramount importance for reducing the time from idea creation to putting a product on the market and successfully turning innovative ideas into profitable ventures.

Due to its nature as a Key Enabling Technology (KET), Photonics is one of the most prominent drivers for the modernisation of Europe's industry, strengthening its competitiveness, creating new jobs and supporting growth for SMEs. Within this framework, the project RespiceSME was launched to strengthen the role of clusters and networks as facilitators by reinforcing the innovation capacity and stimulating targeted collaborations of European Photonics SMEs in and beyond photonics.

With its unique 3-dimensional approach, RespiceSME focused on *evaluating and stimulating the innovation potential* of high-tech photonics SMEs (*Dimension 1*); enhancing the *global technological exploitation* of photonics innovations by *analys-*