Action MP1401

Advanced fibre laser and coherent source as tools for society, manufacturing and lifescience

Special Interest Group
Techno-economical aspects

Zadar, 14 April 2016

Co-chairs: Anke LOHMANN, Matej KOMANEC

Vice-chairs: Dermot BRABAZON, David MECHIN

SIG1 Program

- Introduction
- Laser survey results
- Stefano Taccheo, "**Round Robin on Laser Measurements**"
- "**Opportunities in H2020**"
- 4 company presentations:
  - P. P. Millan, Fyla, Spain, "**Fiber lasers. Focused on customer R+D needs and perspectives**"
  - Jesús Palací, LuzWavelabs, Spain, "**Fiber Lasers for Thz Waves Generation**"
  - David Moore, Viska, Ireland, "**Challenges in high-throughput and high-accuracy micro-machining with fibre lasers**"
  - Dermot Brabazon, DC University, Ireland, "**Laser processing of metallic surfaces for exquisitely controlled texture and metallic joint bond strength**"
- Round Table and Open Discussion

Introduction

- Review of the SIG1 aims
- Industrial advisory board
- Fiber laser market 2014-2015 overview

Aims as specified in MoU

1. Contact outside this Action all the possible stakeholders like, industries, governmental bodies, consortia, EU projects, other COST Actions.
2. Evaluate existing programs that overlap with objectives of the Action and support synergies at EU level and avoid duplications.

H2020 presetantion, 2nd year work

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3. Provide a market drivers analysis (Advance Manufacturing, Healthcare and ICT). This will provide guidelines for manufacturers.

Our laser survey

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4. Study the standardization status with particular attention to recommendations on lasers, safety and components.
5. Provide to all Action members and the general public a global view on standards and technological perspectives.

Looking for volunteers?

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6. Evaluations of the technological impacts and social benefits.

3rd, 4th year work

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7. *This group will investigate possibilities of low cost components for UV.*

Industry and Economic Advisory Board, ELM

Should have 10 members. Currently these six members are included (given by Stefano):

Annett Klotzback (IWS Fraunhofer, DE)	R&D	WG3 chair
Csaba Balaszi (HU)	R&D	WG3 co-chair
Mats Blomqvist (Optoskan, SWE)	Priv. comp.	
David Mechin (Photonic Bretagne, FR)		SIG1 vice-chair
Denis Tregoat (Perfos , FR)		
Thomas Brand (Dilas , DE)		

?

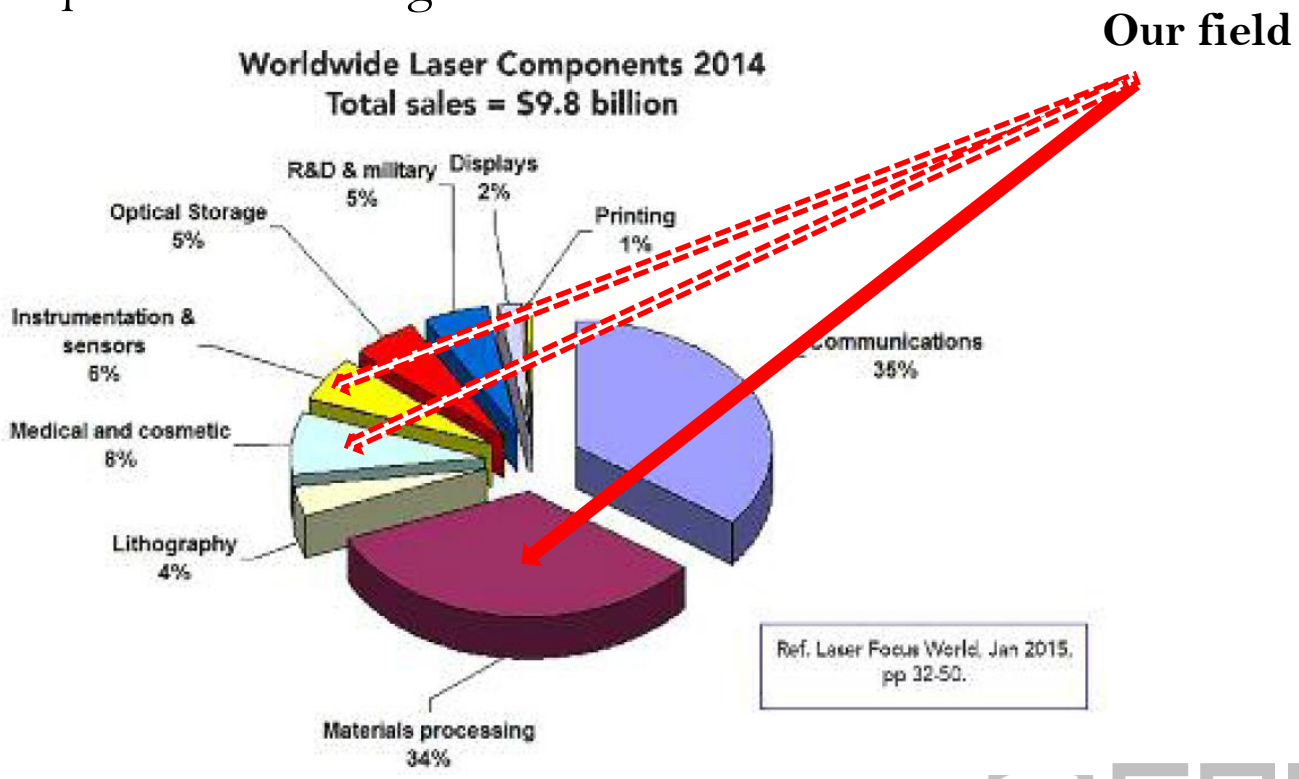
Chair: Matej Komanec (CTU, CZ)	Acad./Priv. comp.	SIG1 co-chair, ELM

+ we are looking for preferably WRs and some members from East Europe to fill the Board.

ELM – External Liasons Manager, responsible for contact outside of the action

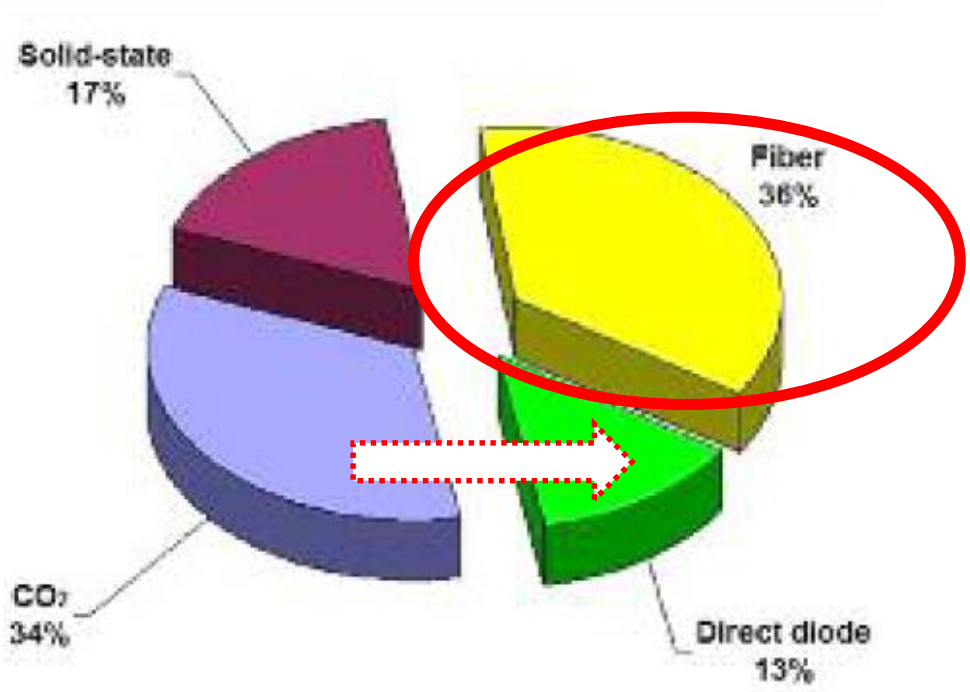
EPIC laser market report - 2014

- Data mainly from companies in EPIC
- Questionnaries and surveys world-wide
- Data from Optech Consulting and Laser Focus World



EPIC laser market report - 2014

- Material processing lasers
- 14.2B USD in 2014
- Fiber lasers consistently growing since 2010 (36% in 2014)
- Diode systems replacing CO_2

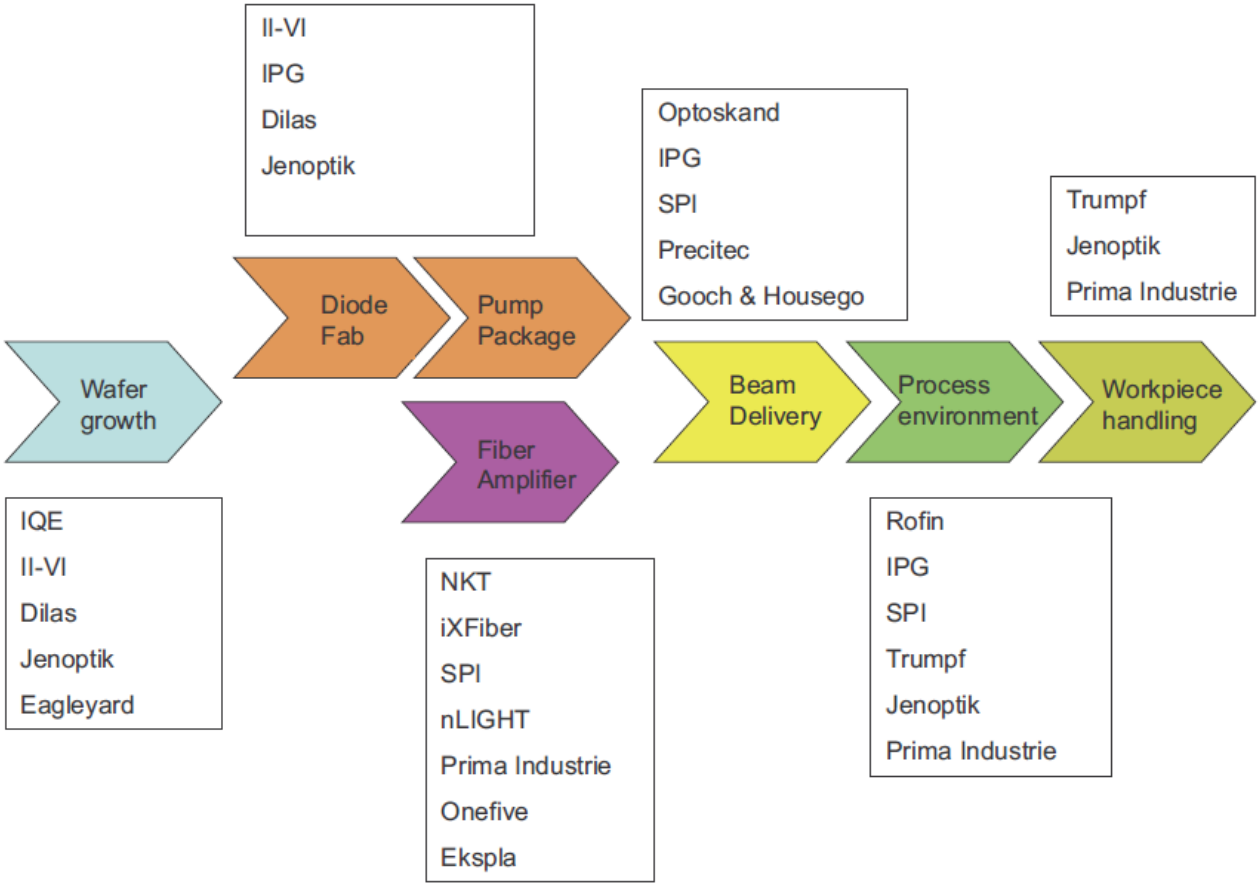


EPIC laser market report - 2014

Traditional	Additive	Company Name	Revenues
X	X	Trumpf	$3 420
X		Bystronic	$350
X		Han's Laser	$941
X		IPG	$745
X		Rofin	$530
X		Prima Industrie	$500
X		Coherent	$794
X		Jenoptik	$720
X		Cymer	$810
	X	Stratasys	$750
	X	3D Systems	$653
	X	Proto labs	$209

EPIC laser market report - 2014

- Fiber laser material processing system – value chain



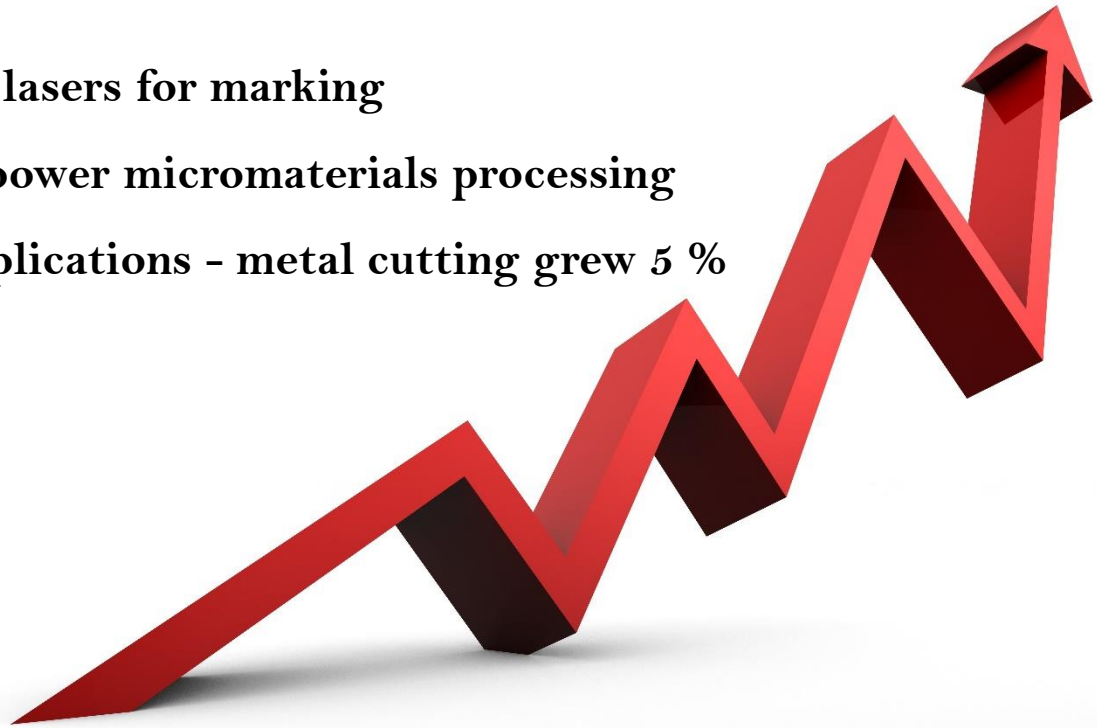
Market in 2015

Fiber laser growth continued in 2015 at the expense of CO_2 (-5%) and solid-state (0%) lasers.

6% increase in low-power lasers for marking

10% increase in medium-power micromaterials processing

22% increase in macro applications - metal cutting grew 5 %



Market in 2015

Challenging Trumpf for market leadership is IPG Photonics

22% growth + close to the $1 billion revenue level.

Market in 2015

"I believe that the year 2015 was the industrial breakthrough year for ultrafast lasers in general, and ultrafast fiber lasers in particular"

Wilhelm Kaenders

president of Toptica Photonics

10% growth sales in 2015

Market in 2015

"Laser-based cinema projection is continuing to penetrate movie theater venues worldwide and even some fiber laser manufacturers are looking to enter the sector."

Laser survey – 1st round

- **Created in cooperation with FYLA**
- **Anonymous**
- **Public access**
- **Should take 5 minutes maximum**
- **Needs feedback and refinement still**

- **4 main questions to define basic laser focus and needs**
- **1 COST related question**
- **5 research related questions (I see these as a weak spot still)**

Laser survey – 1st round

Do you Use (Directly or indirectly) Laser for your Profesional purposes?

16 out of 16 people answered this question

1	Yes	16 / **100%**
2	No	0 / **0%**

- **Out of 176 mailing addresses (complete COST MP1401)**
- **9% response rate**
- **We expect half this number if we go outside our Action**

- **Was a "nice" activity test.**

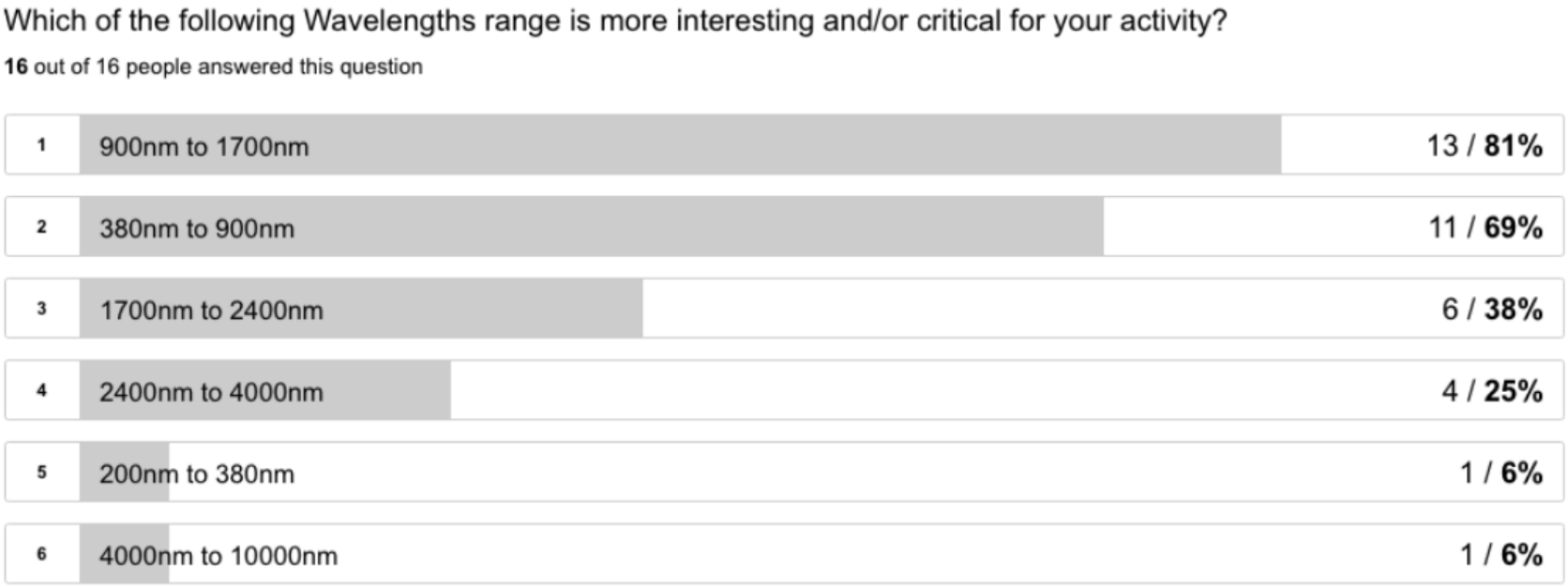
Laser survey – 1st round

Which of the following ones is the field where your work is focused?

15 out of 16 people answered this question

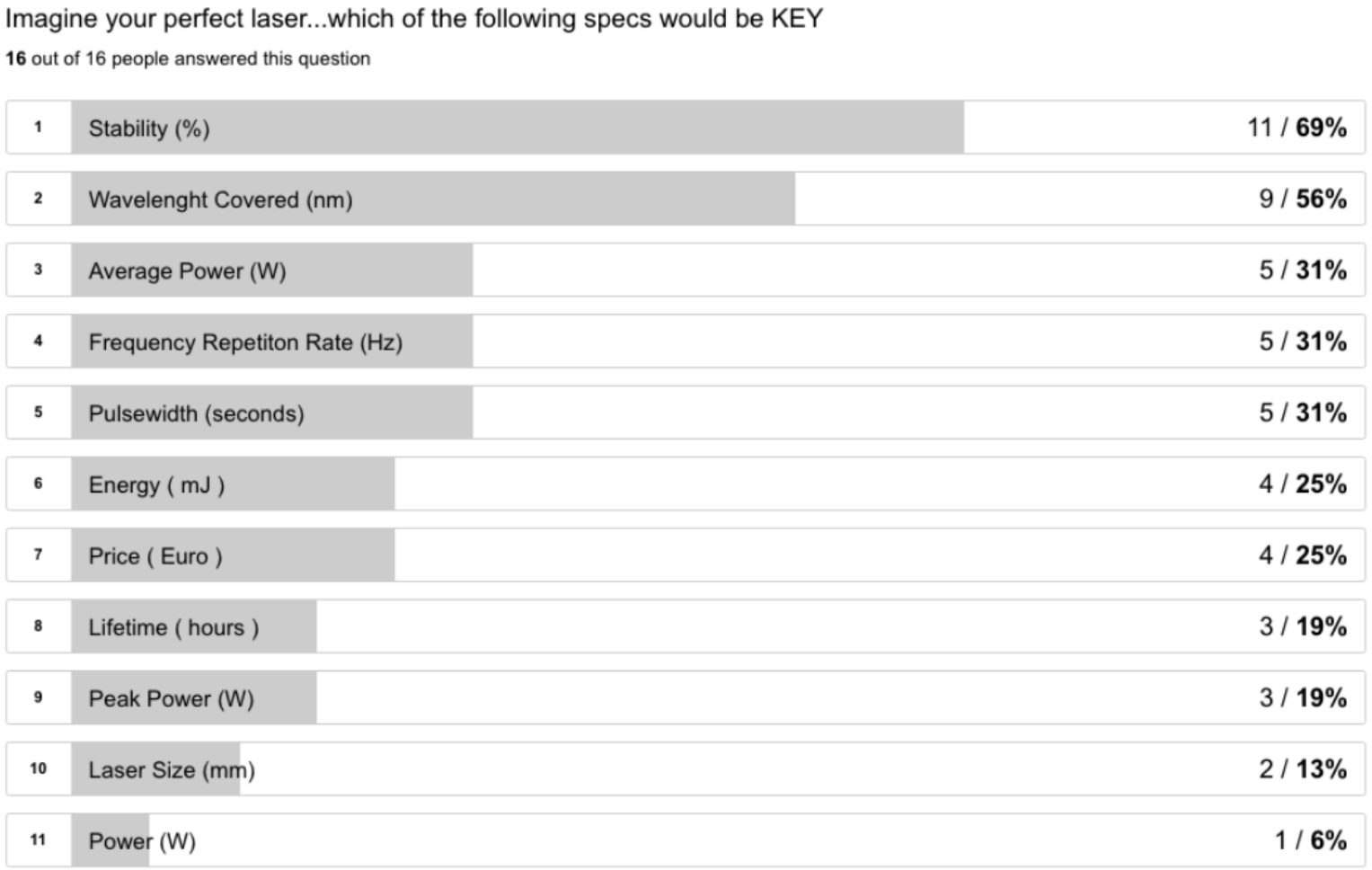
1	Optics & Photonics	9 / **60%**
2	Medical & Bio	2 / **13%**
3	Electronics & Semiconductors	1 / **7%**
4	Engineering & Integration	1 / **7%**
5	Materials Processing & Manufacturing	1 / **7%**
6	Telecomunications	1 / **7%**
7	Arts & Forensics	0 / **0%**
8	Chemistry	0 / **0%**
9	Energy	0 / **0%**
10	Food & Pharma	0 / **0%**

Laser survey – 1st round



- **As we should be UV and MIR focused Action, not much UV here, neither as much MIR as should be…**

Laser survey – 1st round



Laser survey – 1st round

WE LASER
THE NEW INDUSTRY

ABOUT THE ACTIONS TO BE PERFORMED:

16 out of 16 people answered this question

1	LASER MATERIALS - Investigation of laser materials and development of new active materials	5 / **31%**
2	NEW FIBERS - Development of active and passive fibres	4 / **25%**
3	NEW LASER SOURCES - Development of new laser sources: light sources for UV/IR/MIR, development of laser sources for healthcare, manufacturing and environmental monitoring.	3 / **19%**
4	LASER TUNEABILITY - Study of new approaches to wavelength tuning, generation and mode locking	2 / **13%**
5	MODELLING - Modelling of laser materials, laser components and laser/amplifiers devices.	2 / **13%**
6	BUSINESS STRATEGY - Proposal of standards and investigation of techno-economical impacts.	0 / **0%**

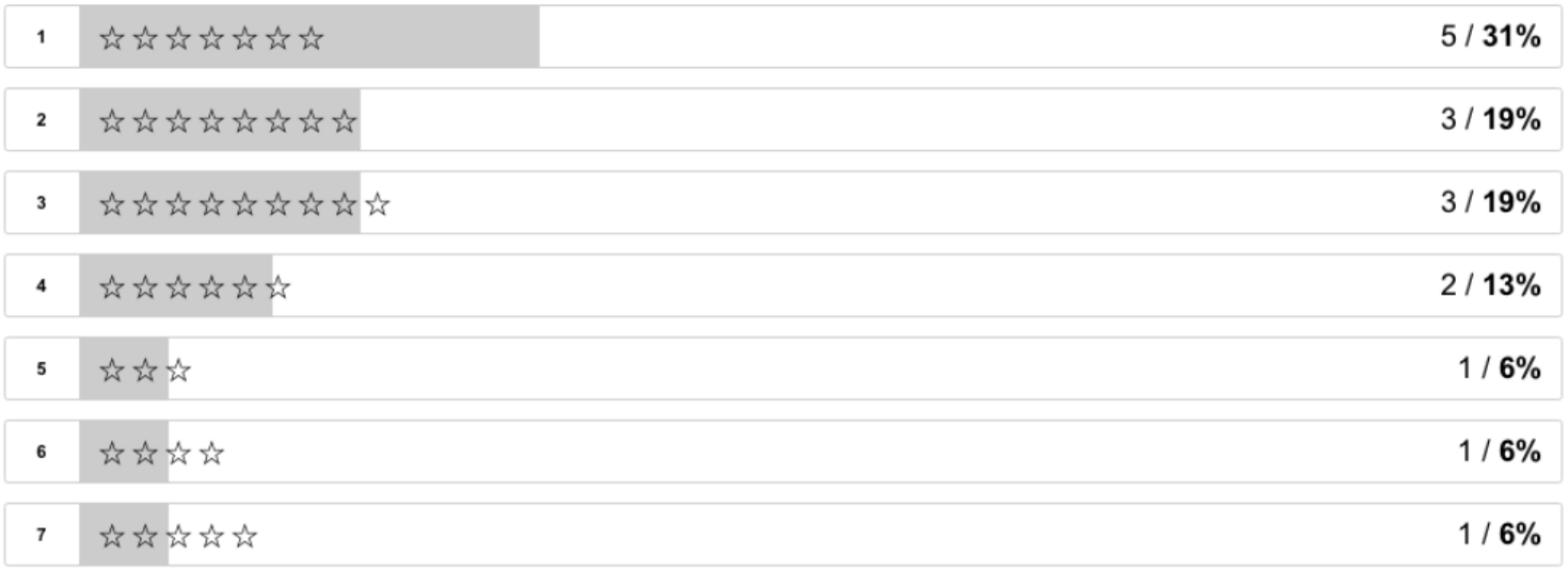
- **This question was designed to be COST related**

Laser survey – 1st round

UV/VIS/NIR/MIR . - Develop new silica glasses + Use pumping schemes based on newly laser wavelengths a + Design new photonic crystal structures - How good would be?

16 out of 16 people answered this question

6.88
Average rating



Brief conclusion

- **We have launched and finished 1st round of the Laser survey inside our Action.**
- **The response rate was as expected.**
- **We need feedback before we launch it public.**
- **We ask for your cooperation and support when it is being launched.**

- **We are looking for active people with experience/time for the standards…**

THANK YOU FOR YOUR ATTENTION