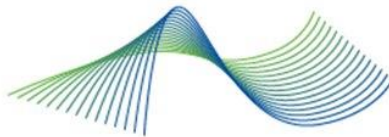

MATERIALS FOR **LIGHT**WEIGHT DESIGN - HOW TO TREAT THEM **RIGHT** VISION AND IMPLEMENTATION OF „**LIGHTRIGHT**“ PROFESSIONAL TRAINING COURSES

Beate Brede

Fraunhofer IFAM, Bremen



LightRight
Materials for Lightweight Design



This activity has received funding from the European Institute of Innovation and Technology (EIT), a body of the European Union, under the Horizon 2020, the EU Framework Programme for Research and Innovation

The Fraunhofer-Gesellschaft

Fraunhofer-Gesellschaft

- Founded in 1949
- 72 institutes
- 25.000 employees
- R&D volume
2.1 billion Euro



Fraunhofer IFAM

- Founded in 1968,
Fraunhofer institute
since 1974
- **Bremen**
Locations in Dresden,
Oldenburg, Stade and
Wolfsburg
- 680 employees
- total budget in 2017
48.5 Mio. Euro

Fraunhofer IFAM – Research, Development, Application

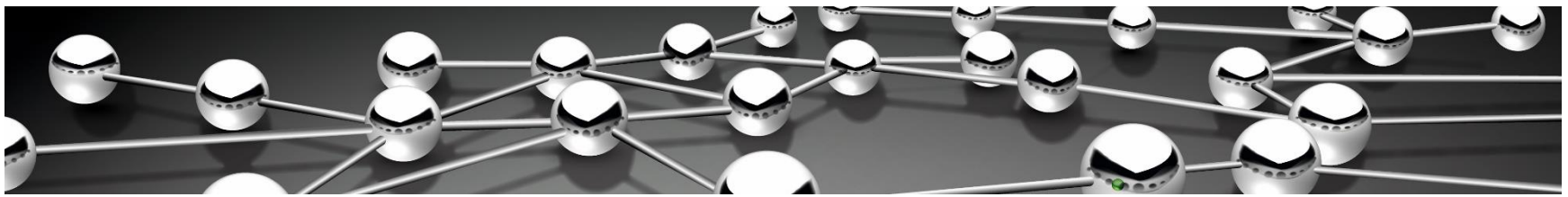
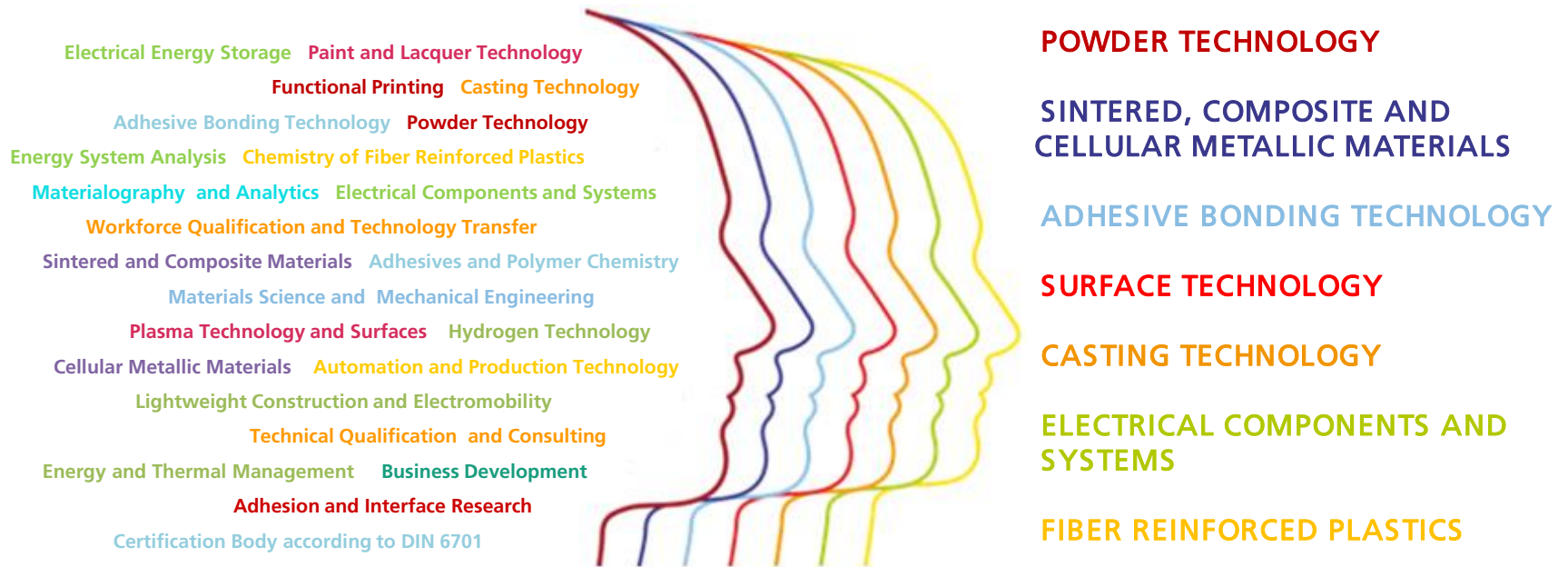


Photo: © MEV

- 24 Departments concentrate their knowledge in 7 core competences



Lightweight Professional Course Modules

	Level	Target group	Objective	Certification
Introductory Module (IM)	Basic level	Managers / technical staff	Overview	First level
<div>FRP</div> <div>ADI</div> <div>Al light alloys</div> <div>Polymers</div> <div>Steels</div> <div>Magne-sium/pow-der metals</div>	Advanced level	Technical staff	Specific materials knowledge	Second level
<div>Supply chain</div> <div>Multi-material design</div> <div>LCA/LCC</div> <div>Recycling</div> <div>Joining techniques</div> <div>Testing</div>	Expert level	Technical staff	Transversal knowledge	Third level

MATERIALS FOR **LIGHTWEIGHT** DESIGN - HOW TO TREAT THEM **RIGHT**

VISION AND IMPLEMENTATION OF „**LIGHTRIGHT**“

PROFESSIONAL TRAINING COURSES

1. Project's vision and goal
2. Project's approach
 - Needs' assessment
 - Needs' analysis
 - Final courses' topics and structure
4. Implementation
5. Combination with existing training courses in composite technology

The LightRight project's history



KU LEUVEN



MONDRAGON
UNIBERTSITATEA



Fraunhofer
ISC

PROJECT GROUP IWKS



**UNIVERSITÀ
DEGLI STUDI
DI PADOVA**



Fraunhofer
IFAM



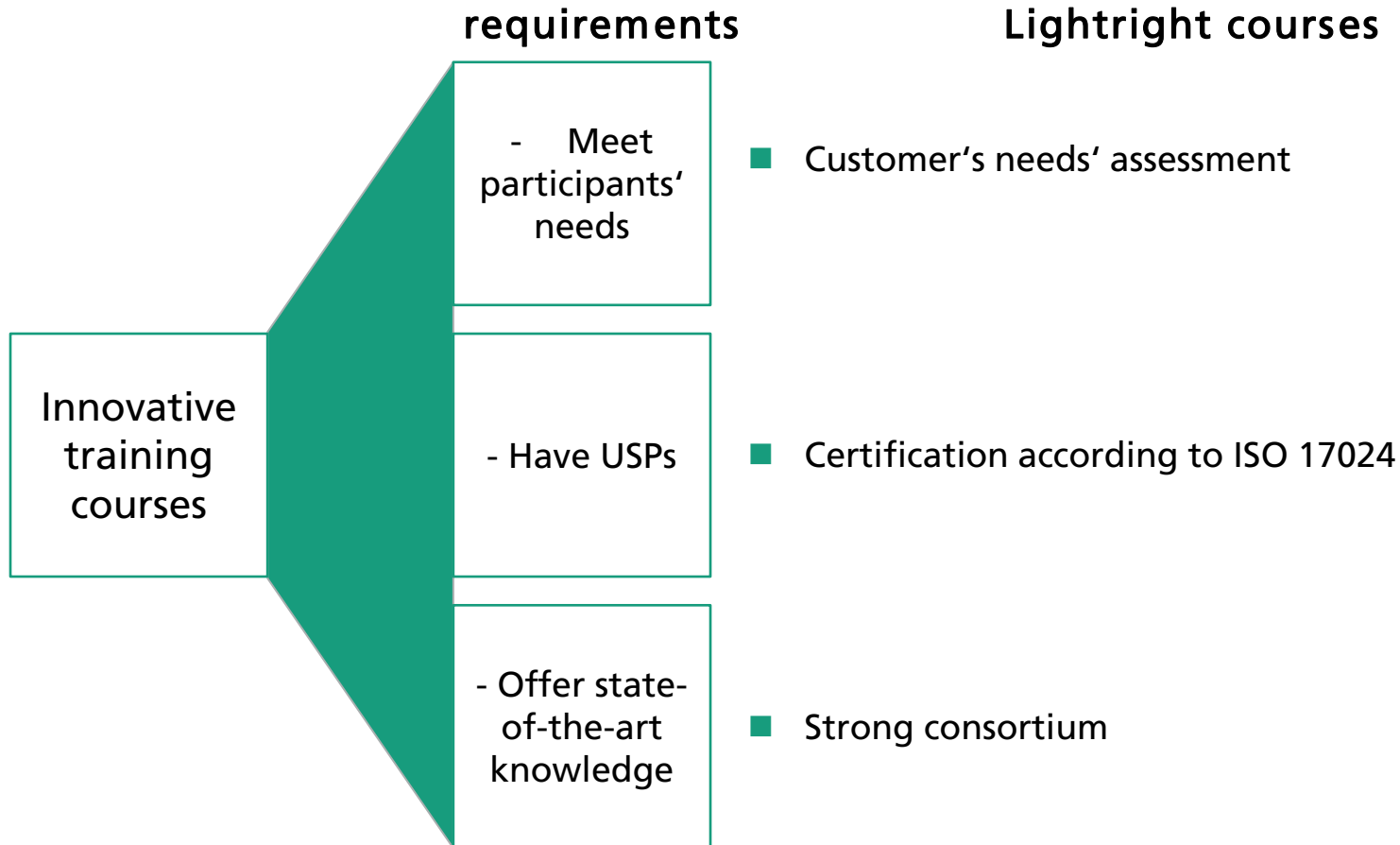
Zanardi
F o n d e r i e

1. LightRight Vision:

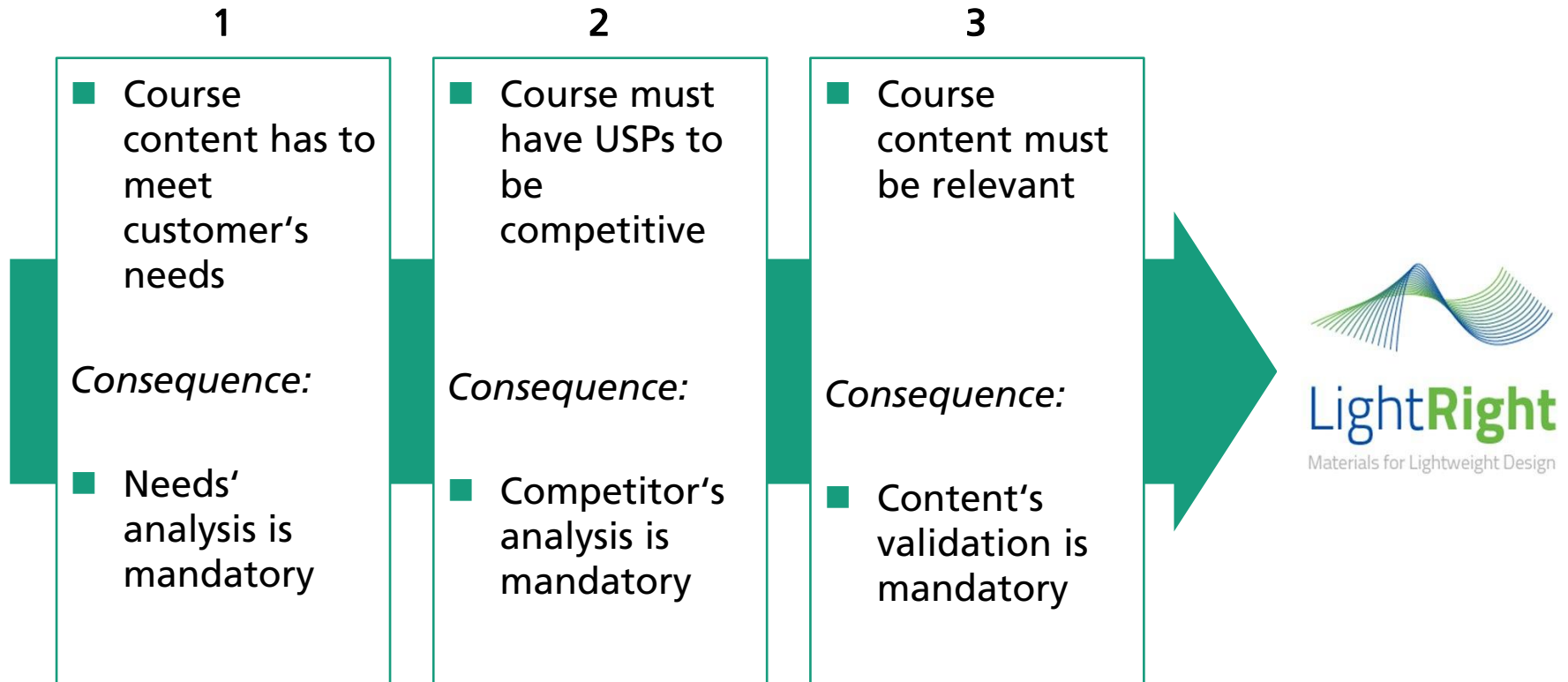
To enable industry to tap the full potential of lightweight design by teaching employees how to do it right

1. LightRight Goal:

Enabling industry to realize this vision by creating and implementing innovative training courses



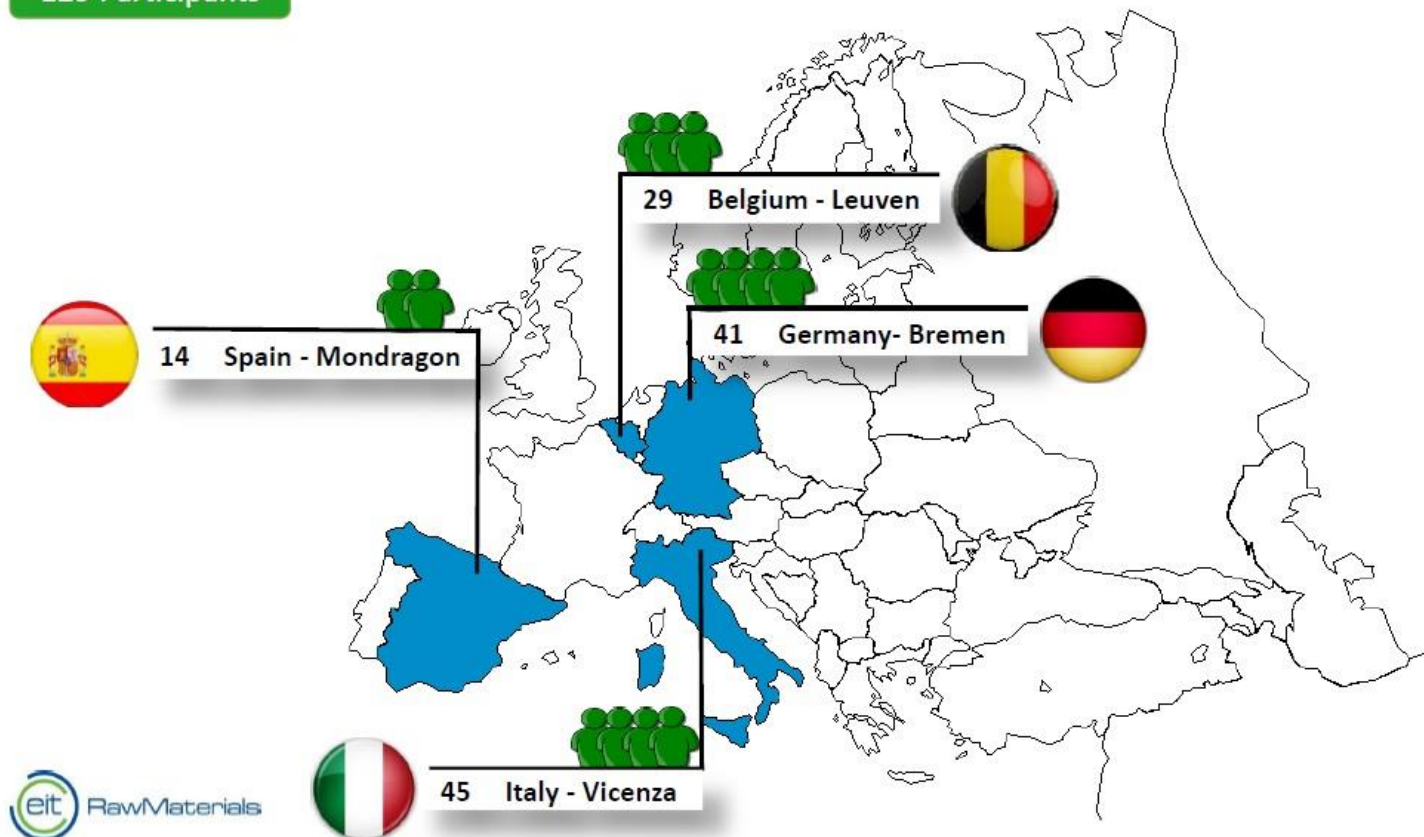
2. Lightright approach is based on three pillars



2. Lightright approach: needs' assessment in workshops

LOCATIONS & NUMBER OF PARTICIPANTS PER EVENT

129 Participants



2. Lightweight approach: needs' analysis

CONCLUSIONS

129 Participants

18 Countries

5 Profiles

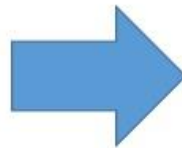
4 Groups

4 Questions

1 Result

Topics of interest

- Material information/properties
- Cost/Value Analysis (LCA)
- Selection criteria: Supply Chain/Infrastructure/Experts
- Guidelines
- Certifications
- Selection criteria
- Case Studies
- Communications
- Format:
 - T-shaped professional courses
 - Blended learning



Useful information for future courses

Courses not only for technical staff but also for other employees (purchasing department/decision maker).

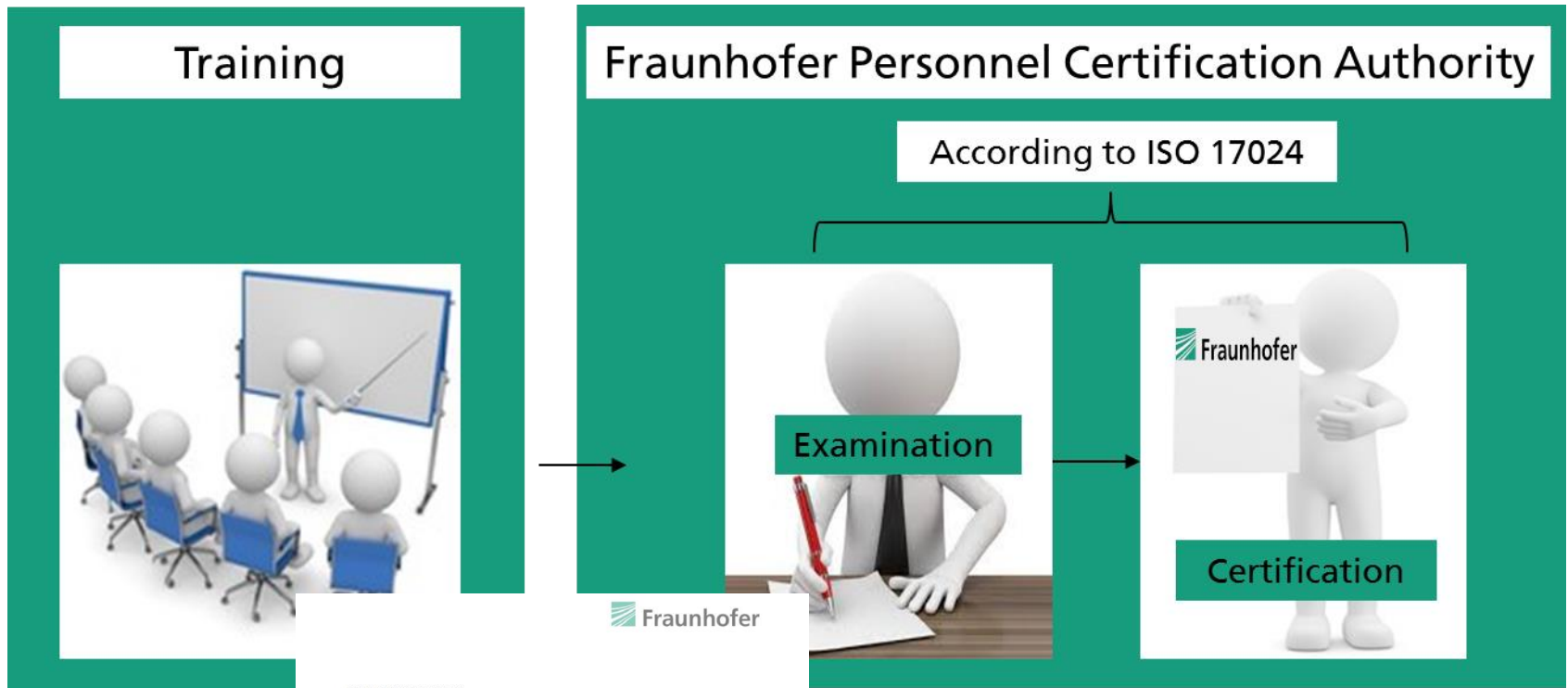
Increase transparency of decisions concerning mandatory investments going along with changes to lightweight materials.

"Lightweight" training course should also include information about supply chains and "best practices": to change established supply chains can be a rigid barrier for innovation.

Professional training courses should always comprise practical work as well.

Participants not only ask for detailed information regarding materials suitable for lightweight applications, but also for a general overview.

2. Lightright approach: structure



ZERTIFIZIERUNGSHANDBUCH UND PRÜFUNGSORDNUNG

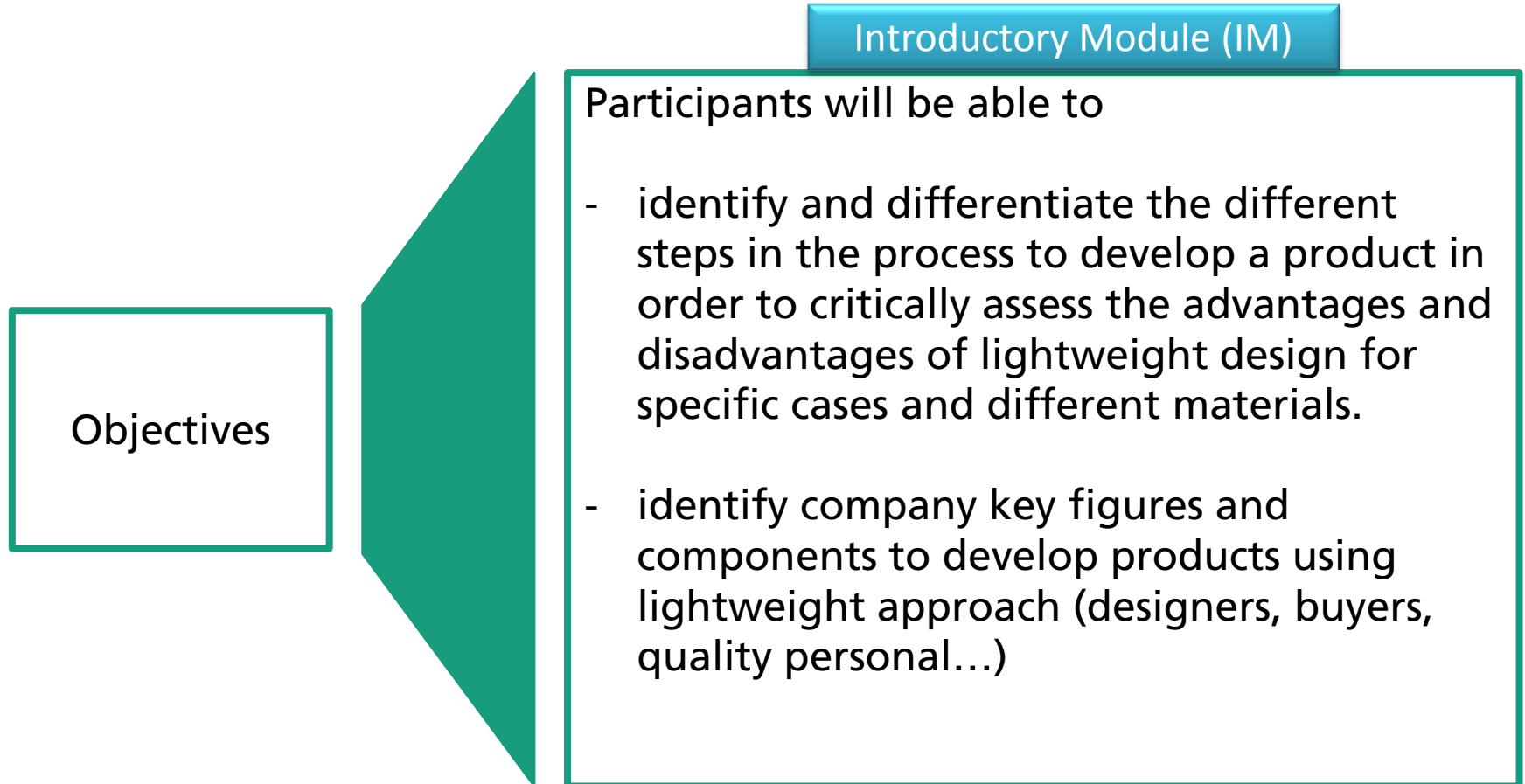
Personenzertifizierungen im Bereich
Faserverbundwerkstoffe –
Composite Engineer

Revision 01

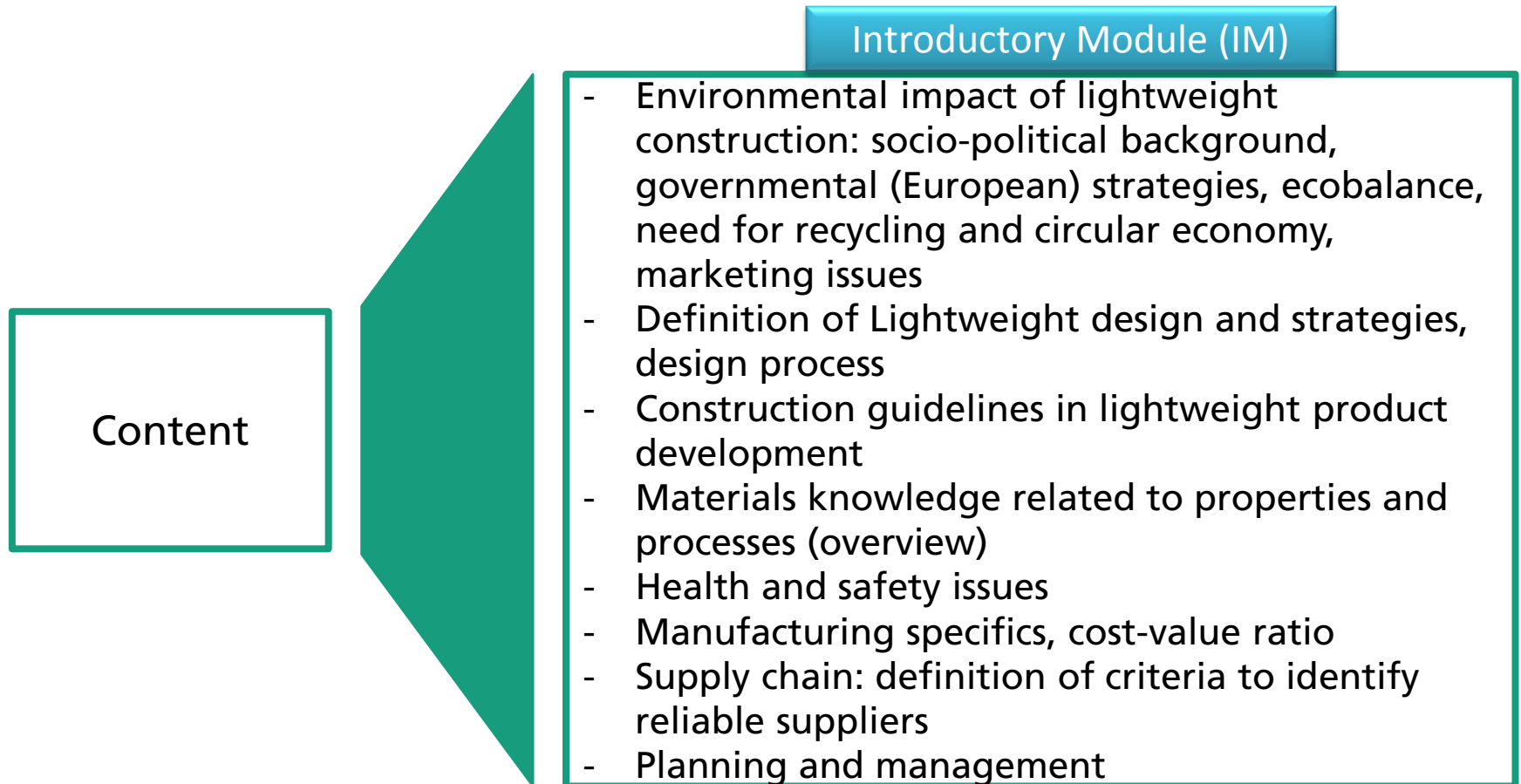
2. Lightright approach: courses' topics and structure

Lightweight Professional Course Modules	Level	Target group	Objective	Certification
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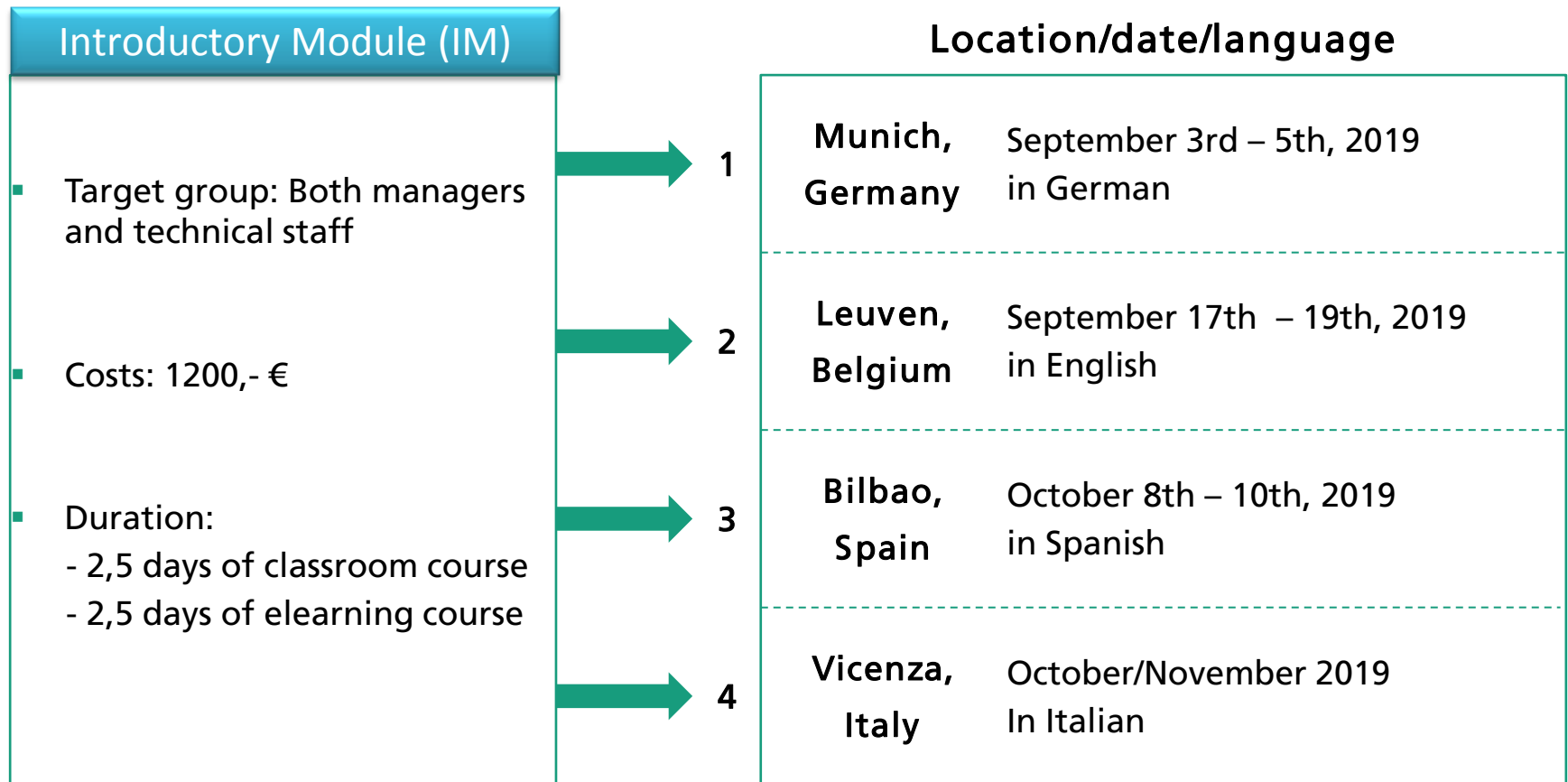
3. Lightright approach: implementation



3. Lightweight approach: implementation



3. Lightright approach: implementation



5. COMBINATION WITH EXISTING TRAINING COURSES IN COMPOSITE TECHNOLOGY



COURSES

Target group	Welding	Adhesive Bonding	Fiber composite technology
managers	IW Engineer Guideline DVS®-IIW/EFW 1170 (IAB 252r1-11)	EA Engineer Guideline DVS®/ EWF 3309 und EWF 517	Composite Engineer Fraunhofer PersZert „Zertifizierungshandbuch“
supervisors	IW Specialist Guideline DVS®-IIW/EFW 1170 (IAB 252r1-11)	EA Specialist Guideline DVS®/ EWF 3301 und EWF 516	FRP Specialist Fraunhofer PersZert „Zertifizierungshandbuch“
operators	IW Practitioner Guideline DVS®-IIW/EFW 1170 (IAB 252r1-11)	EA Bonder Guideline DVS®/ EWF 3305 und EWF 515	FRP – Manufacturer FRP – Remanufacturer Fraunhofer PersZert „Zertifizierungshandbuch“

Adhesive bonding technology and surfaces



Composite Engineer

Objectives of the training course

- Overview over the whole process chain
- Professional and appropriate application of FRP technology
- To think, judge, decide and act in an interdisciplinary way

Duration and exam:

- Every module takes three days (independently bookable)
- Overall duration of 30 days (6 weeks resp. 240 hours)
- The basic and advanced modules are completed by written exams

Target groups:

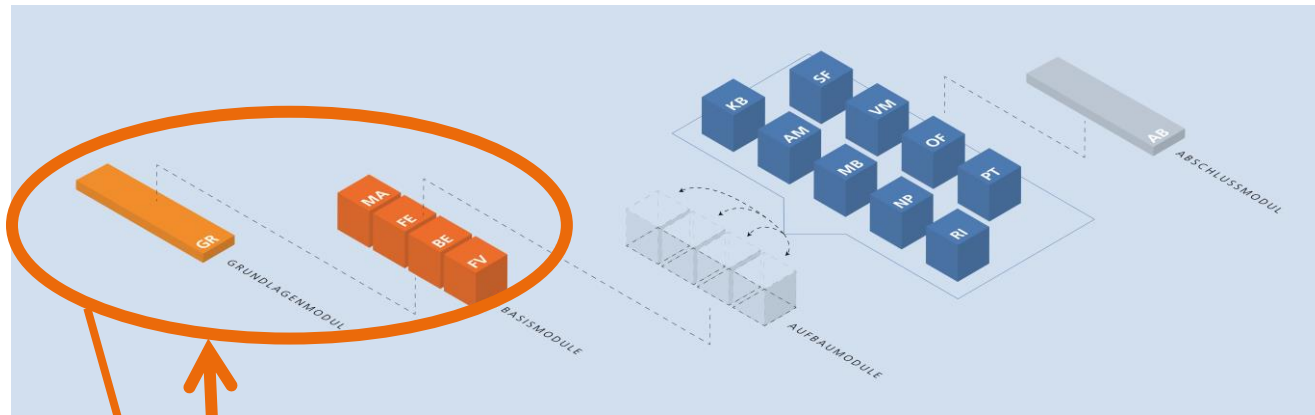
- Engineers, natural scientists and experienced employees whose work involves planning the manufacture of FRPs and implementation in the process chain, and those in companies that want to start manufacturing FRPs.

Composite Engineer



- Fundamental module
- 4 basic modules (compulsory):
 - Materials
 - Manufacturing methods
 - Machining and processing
 - Joining techniques
- 4 advanced modules (elective) out of ten (e.g. construction methods, simulation, surface treatment, virtual material design etc.)
- Termination module
 - Revision
 - Final examination (Certificate: Composite Engineer)
- **International CE starting in November 2019!**
- **For further information: www.bremen-composites.com**

LIGHTWEIGHT PROFESSIONAL AND COMPOSITE ENGINEER: INTEGRATION AND INTERACTION



Lightweight Professional Course Modules

	Level	Target group	Objective	Certification
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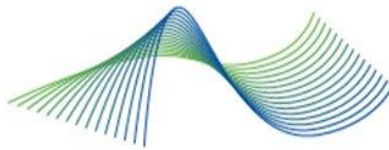
Adhesive bonding technology and surfaces

TRAINING CENTER FOR FIBER COMPOSITE TECHNOLOGY



Shaping a stronger future

www.bremen-composites.com



LightRight
Materials for Lightweight Design



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Adhesive bonding technology and surfaces

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IFAM