

# Analysis of needs, offers and gaps for Innovation & Technology Transfer services for companies in the North-East region of Romania

Contract N° CCI 2016CE16BAT071

North-East Region of Romania (NE)

Author: Dr. Jonathan Loeffler

Version 2 – 01.12.2017

## Table of Content

1	Context of the study.....	6
2	Executive summary .....	7
2.1	Introduction.....	7
2.2	Survey on needs of companies for I&TTservices.....	9
2.2.1	Results on companies' objectives and partnerships .....	10
2.2.2	Results on innovation management, new technologies and research knowledge.....	11
2.3	Results of the survey on I&TT services offered .....	13
2.4	Gap analysis.....	16
3	Analysis of results from the on-line questionnaire concerning companies' I&TT needs.....	19
3.1	Section 1 - Profile of the companies participating to the survey in the NE Region .....	19
3.1.1	Section 1.1 - Creation date .....	20
3.1.2	Section 1.2 - Size of the company .....	20
3.1.3	Section 1.3 - Involvement in RDI activities .....	21
3.1.4	Section 1.4 – Turnover .....	22
3.1.5	Section 1.5 - Economic sector .....	23
3.1.6	Role in the value chain .....	24
3.2	Section 2 – Company's objectives and partnerships.....	26
3.2.1	Company's objectives for the near future in regard to (multiple choice possible).....	26
3.2.2	Partnership in the domain of research, technological development and innovation ..	33
3.3	Section 3 – Innovation management, new technologies and research knowledge.....	37
3.3.1	Support services needed .....	37
3.3.2	Frequency of use of RDI services per year in the future .....	41
3.3.3	Long term vision of innovation.....	42
3.3.4	Financial budget for innovation measures.....	46
3.3.5	Contribution of employees concerning innovation.....	47
3.3.6	Systematic method for innovation.....	49
3.3.7	Information sources concerning innovation and R&D activities.....	51
3.3.8	Use of new technologies/R&D knowledge for new products/services development ..	54
4	Analysis of results from the on-line questionnaire concerning I&TT offers of research organisations .....	60
4.1	Organisation profile.....	60
4.1.1	Professional experience: .....	60
4.1.2	Function in the organization: .....	60
4.1.3	In which of the following branches is your organisation active? .....	61
4.1.4	In which of the following Key Enabling Technology fields is your organization active? ..	61

4.1.5	The activities of my your organization cover the following categories (Technology Readiness Level – TRL) of research, technological development and innovation (Please check all that apply) .....	62
4.2	Services.....	63
4.2.1	Does your organization offer services to external organizations?.....	63
4.2.2	Which of the following scientific & technological services related to product development does your organization offer to external organizations? .....	64
4.2.3	From the services mentioned above, which 3 are generating the most profit?.....	66
4.2.4	How frequently does a company use these services on average during one year? .....	66
4.2.5	If services are not open to SMEs, due to which of the following <b>barriers</b> (Please check all that apply).....	67
4.2.6	We would like to understand better your approach towards services for Small and Medium Enterprises .....	67
4.2.7	Conclusion concerning services.....	69
4.3	Partnerships and Collaborations .....	70
4.3.1	Does your organisation collaborate with other Technology Platforms on applied research projects? .....	70
4.3.2	Conclusion for section 4.3 .....	74
5	Methodology of the analysis .....	75
5.1	Market-driven approach .....	75
5.1.1	Template form for data collection .....	75
5.1.2	Analysis of the data collected during the survey and formulation of recommendations	76
5.1.3	Validation of the statistical results of the survey through interviews with company representatives.....	76
5.2	Technology-driven approach.....	77
5.2.1	Methodology for gathering information from existing ITT structures in the NE Region	77
5.2.2	Template form for data collection .....	77
5.2.3	Analysis of the data collected during the survey and formulation of recommendations	78
5.3	Identification of the gaps and matches between needs and offers.....	78
5.3.1	Support competitiveness of companies .....	79
5.3.2	Support financing and knowledge exchange .....	79
5.3.3	Shift of mentality and improved collaboration culture between RDI and SMEs .....	79
6	Glossary .....	81

## List of figures

Figure 1 – Simplified model of companies' needs to achieve their main objectives .....	7
Figure 2: Link between I&TT services and companies' needs in the domain of innovation .....	8
Figure 3: Services in the 4 main phases in the I&TT support process .....	9
Figure 4 – Deficit of services in the different I&TT phases.....	15
Figure 5 - Overview on the services asked by companies.....	17
Figure 6 – Overview of services offered at different levels by RDI organisations.....	18
Figure 7 – Percentage of companies from the different economic sectors.....	23
Figure 8 – Quantitative distribution of company size in the different economic sectors.....	24
Figure 9 – Percentage of companies in each sector depending on the number of employees.....	24
Figure 10 - Distribution of objectives in the domain of products/services.....	26
Figure 11 - Distribution of objectives in the domain of Business operations .....	27
Figure 12 - Distribution of objectives in the domain of R&D / processes .....	27
Figure 13 – Objectives related to products and services in the different sectors .....	30
Figure 14 – Objectives related to business operations in the different sectors .....	31
Figure 15 – Objectives related to R&D/Processes in the different sectors.....	32
Figure 16 – RDI partnerships .....	33
Figure 17 – Number of companies having RDI partnerships at different geographical level .....	33
Figure 18 – Number of companies having RDI partnerships in relation to the size of the companies. ....	34
Figure 19 – Number and percentage of companies having RDI partnerships with different types of organisations .....	34
Figure 20 – Percentage of companies having or not having RDI partnerships .....	35
Figure 21 – RDI support services needed .....	37
Figure 22 – Need for RDI services vs. company size.....	38
Figure 23 – Needs for RDI services vs. RDI intensity .....	39
Figure 24 – Need for RDI services vs. economic sector.....	40
Figure 25 – Frequency of use of RDI services per year .....	41
Figure 26– Frequency of use of RDI services vs. company size.....	41
Figure 27 – Vision on product innovation .....	42
Figure 28 – Vision on service innovation.....	42
Figure 29 – Vision on R&D innovation.....	42
Figure 30 – Vision on product-innovation vs. company size.....	43
Figure 31 – Vision on service-innovation vs. company size .....	43
Figure 32 – Vision on R&D activities vs. company size.....	44
Figure 33 – Vision for product-innovation in the different economic sectors.....	44
Figure 34 – Vision for service innovation in the different economic sectors.....	45
Figure 35 - Vision for service innovation in the different economic sectors .....	45
Figure 36 – Percentage of companies having an internal budget for innovation .....	46
Figure 37 – Innovation budget vs. company size .....	46
Figure 38 – Percentage of companies having their own innovation budget vs. economic sectors .....	47
Figure 39 – Primary role of employees in the innovation process.....	48
Figure 40 – Role of employees vs. company size .....	48
Figure 41 - Role of employees vs. economic sectors.....	49
Figure 42 – Percentage of companies having systematic innovation method .....	50
Figure 43 - Percentage of companies having systematic innovation method vs. company size .....	50
Figure 44 - Percentage of companies having systematic innovation method vs. economic sector .....	51
Figure 45 – Internal innovation sources.....	52
Figure 46 – Market-mediated innovation sources.....	52

Figure 47 – Research-mediated innovation sources .....	53
Figure 48 – Other external innovation sources .....	53
Figure 49 – Percentage of companies using new technologies or R&D knowledge in their products/services .....	54
Figure 50 - Use of new technologies or R&D knowledge vs. company size .....	54
Figure 51 - Use of new technologies or R&D knowledge in relation to economic sectors .....	55
Figure 52 – Main drivers to use new technologies and R&D knowledge.....	56
Figure 53 – Main drivers vs. company size.....	57
Figure 54 – Main drivers vs. economic sectors .....	57
Figure 55 – Main barriers to use new technologies and R&D knowledge .....	58
Figure 56 – Main barriers vs. company size .....	58
Figure 57 – Main barriers vs. economic sectors.....	59
Figure 58 – Lack of services in the I&TT phases .....	65
Figure 59 – Market-driven and technology-driven approaches of the methodology.....	75

## List of tables

Table 1 – Distribution of the companies depending on their date of creation.....	20
Table 2 – Number of companies depending on their number of employees .....	20
Table 3 – Statistical distribution of companies depending on the percentage of RTD staff.....	21
Table 4 - Statistical distribution of companies depending on turnover.....	22
Table 5 - Statistical distribution of companies depending on economic sectors.....	23
Table 6 - Statistical distribution of companies depending on economic sectors and number of employees .....	23
Table 7 – Distribution of developers .....	25
Table 8 – Distribution of producers.....	25
Table 9 – Distribution of users .....	25

## 1 Context of the study

The Romanian Ministry of Regional Development, Public Administration and European Funds (MDRAPFE) as Managing Authority for Regional Operational Programme 2014-2020 financed under Priority Axis 1 - *Promoting technology transfer specific objective - Increasing innovation in companies by supporting innovation and entities technology transfer in the areas of smart specialization* – intends to identify priorities for Innovation & Technology Transfer (ITT) services offered by research organisations in the North-East Region of Romania. This initiative to identify the ITT needs of the companies and the gaps in the existing competences of the regional ITT offer was coordinated with the Regional Development Agency North-East (RDA NE) and was included in the Policy Mix Action Plan of the Lagging Regions Initiative.

The goal of this survey is to exploit the potential for innovation and strengths in the region by focusing on a limited number of priority areas, where there is already a competitive advantage, or one can be developed.

In the next ten years scientific developments in Key Enabling Technologies<sup>1</sup> will influence many different industrial branches e.g. agro-food, textiles & clothing, industrial automation, ICT, healthcare & well-being, environment or energy. In these industrial sectors many companies and especially SMEs are involved as traditional suppliers, start-ups or producers of high-tech products. In order to remain competitive on these markets, the companies have to integrate these new results in their commercial vision for future products.

It is of strategic importance for the companies in North-East Romania to have access to support services to develop their activities in the domain of innovation partnership and technology transfer.

Until now the acceptance and integration of novel research results by SMEs is limited. In order to improve the acceptance it is important to demonstrate to the SMEs the link between available RTD results and the technological needs of SMEs' products. For this reason it is necessary to identify the needs of the companies. This will be performed in a market-driven approach.

Furthermore this project has a cross-sectoral approach. The SMEs were chosen from different strategic industrial sectors of the region, especially aligned with the RIS3 priorities on Agro-food, Textiles & Clothing, ICT, Biotechnology, Environment, Clean & Safe energy and Tourism.

On the other side it is important to identify the Innovation & Technology Transfer structures, which already offer this type of support services to the companies and can be further developed. A technology-driven approach, based on the offers of the existing regional I&TT structures, especially for applied research aspects will be also performed at regional level. The final outcome of this initiative will be recommendations on how to support the access of companies of the NE region to Innovation Support Services and Technological Platforms<sup>2</sup>.

As important actors in the ITT process, the existing regional clusters will be strongly involved. The clusters are in the domains of Agro food, Textiles, Tourism, ICT and Biotech & Imagistic Medicine.

---

<sup>1</sup> Key Enabling Technologies (nanotechnology, photonics, advanced materials, industrial biotechnology, micro and nano electronics, advanced manufacturing technologies)

<sup>2</sup> A Technological Platforms is a technological facility (public or private) which offer services to enterprises, including SMEs like prototyping, demonstration lines, lab test facilities so that they can bring new products and services to market involving one or more KETs

## 2 Executive summary

### 2.1 Introduction

This paragraph will introduce the thematic and explain the structure of the analysis. This analysis will help to give an answer to the following questions:

1. What are the needs of companies in the domain of Innovation & Technology Transfer (I&TT) in the region?
2. What type of services can be offered by research organisations to answer the companies' needs?
3. Where are the gaps between needs and services, which could be filled by the development and support of new I&TT services through the Regional Operational Programme 2014-2020 financed under Priority Axis 1 by identifying priorities for Innovation & Technology Transfer (ITT) in the North-East Region of Romania?

In a simplified model, two main domains with specific objectives for the development of companies can be distinguished:

- The domain of *Business Development*: it is essential for companies to develop their business in order to sell their products or services to a maximum number of clients. For this they have the objectives:
  - i. To develop **attractive products and services with new functionalities** as well as,
  - ii. To identify **new clients and new markets**.
- The domain of the *Internal Company Development*: quality and costs are the main drivers in this domain, so the companies have two main objectives here:
  - i. To **improve the quality** of the existing products/services
  - ii. To **reduce costs**

In order to achieve these main objectives, the companies have needs in the following six categories:

- |              |                       |
|--------------|-----------------------|
| 1. Knowledge | 4. Management         |
| 2. Contacts  | 5. Equipment          |
| 3. Financing | 6. Qualified personal |

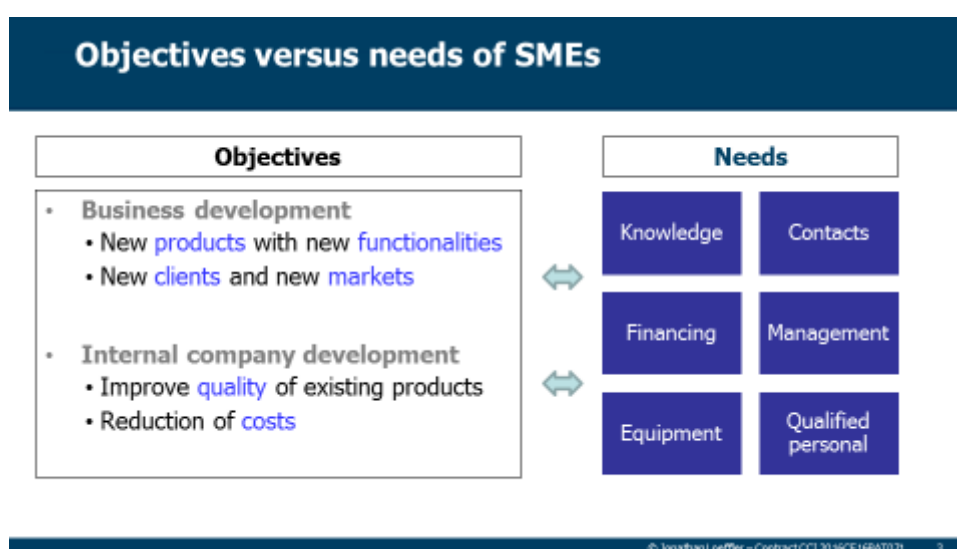


Figure 1 – Simplified model of companies' needs to achieve their main objectives

The company can either find answers to these needs *internally* or look for *external solutions* (Figure 2). Big companies have most of the resources internally, but SMEs need to enter partnerships and collaborations to boost their development. In the case of Innovation and Technological Development, the collaboration with research organisations and intermediary bodies is of strategic importance.

The main challenge of the collaboration between companies and research organisations can be formulated in one question, which will determine the structure of this analysis: **How Innovation & Technology Transfer services from R&D/Innovation (RDI) organisations can give answer to these companies' needs?**

The following figure shows which I&TT services can give an answer to the different types of companies' needs introduced before and support the objectives of the companies' development.

The strong link to the objectives of the companies is essential to achieve the sustainability at long term of the services developed. The companies will be ready to ask for the services and even to pay for them, only if they are in-line with their objectives and if they give an answer to their specific needs. For this reason the starting point of this analysis is demand-driven.

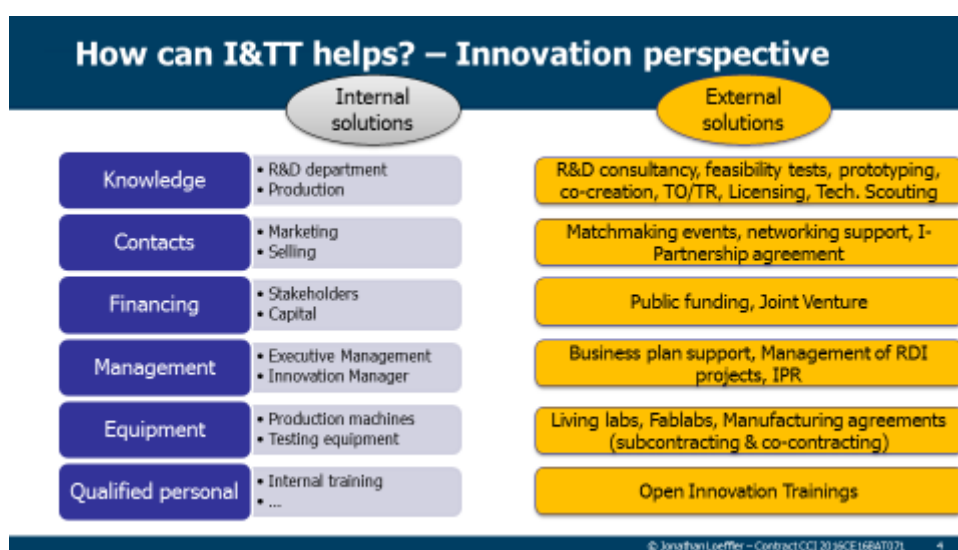


Figure 2: Link between I&TT services and companies' needs in the domain of innovation

The following list gives a short description of the different support services which were proposed to the companies in the survey in order to enhance their activities in the domain of innovation and technological development:

- Integrate New Knowledge / Technology in products or services through
  - *Research contracts* in order e.g. to develop prototypes, make some feasibility tests or have *R&D consultancy* and technical assistance support.
  - *Intellectual Property Rights* support (licensing centres, patent portfolio management)
- Contacts for *innovation partnerships* (at regional, national, international level)
  - *Brokerage Events* between companies and research organisations (study visits, conferences, fairs, idea competition and prizes)
  - *Databases* with technology offers, studies, roadmaps
- *Innovation Financing* / funding support to perform the development steps



- Innovation Management support by
  - *Training / Coaching / Mentoring* measures
  - *Technology assessment*, analysis of innovation potential
  - *Business support* (Technology scouting, Benchmarking, Market survey, commercialisation bootcamps)
- Access to high level equipment in the frame of *subcontracting or co-contracting agreements* with *Fablabs, Living labs* for the manufacturing of pre-series or quality control and testing.
- Access to qualified personnel by entering an open innovation process

These different services can be integrated in 4 different phases in the I&TT process described in the following figure:

- *Awareness raising phase* (events, information campaign...)
- *Phase for the analysis of needs* (company visits, innovation audits and business consultancy...)
- *Matchmaking phase* to initiate the innovation partnerships (brokerage events, technology requests and offers...)
- *Implementation phase* of the collaboration projects (consulting and advice contracts for proof of concept, management of IPR, investment analysis, recruitment of qualified personnel, technology audit, technology watch, coaching and mentoring with experts, prototyping, demonstration, creation of spin-offs and start-ups, feasibility studies, mentoring in innovation management...)

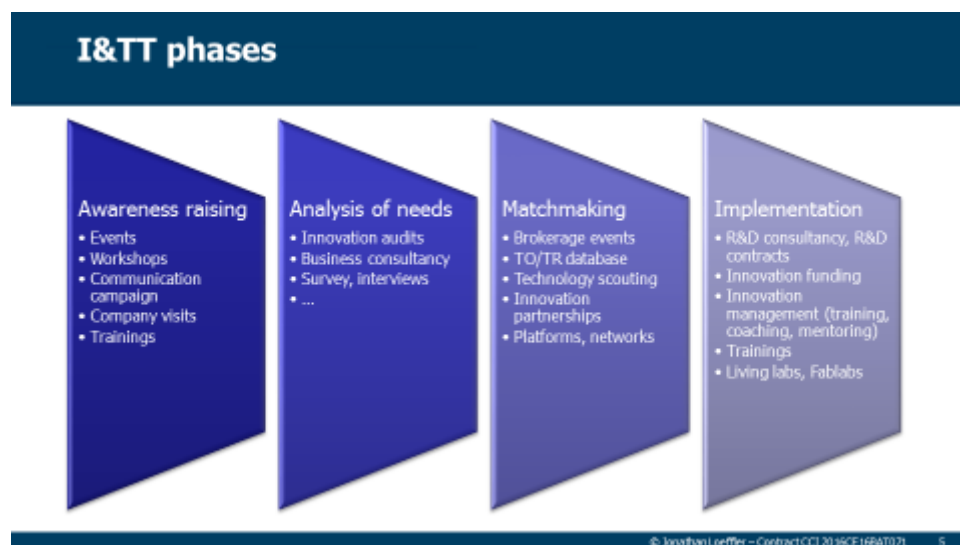


Figure 3: Services in the 4 main phases in the I&TT support process

The analysis will also identify in which phase the services should be reinforced.

## 2.2 Survey on needs of companies for I&TT services

### Profile of companies

**783 companies** have participated to the survey - 96% of the companies are established companies older than 5 years – all sizes of companies are represented (<10, 10-50, 51-250 and >250 employees)

The **economic sectors** represented are Agro-food, Bio-Tech, Environment, IT&C, Textiles & Clothing, Tourism

The survey on needs of companies for I&TT services was divided into two main sections:

1. Company's objectives and partnerships in terms of Research, Innovation and Technology Transfer
2. Needs in terms of innovation management, new technologies and research knowledge

The following paragraphs will summarised the results of the survey in these two sections.

## 2.2.1 Results on companies' objectives and partnerships

### 2.2.1.1 Companies' objectives

As explained before, the objectives of a company can be divided in two main categories: a first category of objectives dedicated to support the *internal development* of the enterprise concerning production, quality and costs. A second category related to the *external development* (business development) related to gain new clients and reach new markets.

Five objectives have been appointed by more than 60% of the companies (§3.2.1.1).

Three objectives are mainly *related to internal development* of the companies:

- (i) To reduce production costs (75%)
- (ii) To improve the quality (68%)
- (iii) To reduce energy consumption (65%).

Especially in the sectors Agro-food, BioTech and Environment the improvement of the product quality, the reduction of production costs by reducing the use of raw materials and the energy consumption is a higher priority compared to the other sectors (§3.2.1.2). The improvement of the product quality is also a stronger priority in the IT&C sector.

From a *business development point of view*, the objectives are

- (iv) To develop the company's network (75%)
- (v) To reach new markets (63%).

The objective to 'enter new markets' is of higher priority in the sectors Agro-food and Biotech compared to the other sectors (§3.2.1.2).

Concerning *R&D activities*, the objective to increase of R&D activities is especially strong in the sectors of IT&C (52%), Environment (40%) and Biotechnology (38%) compared to an average of 26% considering all sectors.

### 2.2.1.2 RDI Partnerships

Only around 10% of the companies have a partnership in the domain of research, technological development and innovation (RDI) with research organisations. These represent 85 companies in the region. They have RDI partnership at regional and national level. **Only one** of these companies has cooperation also at international level. **A focus on the support of international RDI contacts is necessary.**

Around 60% of the partnerships are with universities or research centres. 30% of the partnerships are with other companies and 10% with other types of organisations like NGO. In the ICT and BioTech sectors the highest percentage of companies have already partnership in the RDI domain. The lowest percentage is in the domain of Tourism.

**This information indicates that there is a big potential in the collaboration with networks and clusters, which should be a significant counterpart of ITT service suppliers to work with on their market development.**

The most cited reasons for not having a RDI partnership are the following:

- It does not suit to the company, company is not ready, no interest or necessity at the moment
- Not aware about the possibility, lack of information, no opportunity, lack of organisation to support the management of such partnerships
- Involve large costs, lack of funding, lack of financial resources
- Lack of human resources, company is too small
- R&D department was recently set up
- Could not find the right partners, no contact in this domain
- No institute regionally available in the domain
- Risk concerning IPR

From the companies not having RDI partnerships yet, more than 46% have the interest to join RDI projects. This shows a big potential for new partnerships and the necessity to have support organisations which help to initiate and organise the matchmaking between offer and demand in the domain of new technologies and innovation for companies.

## 2.2.2 Results on innovation management, new technologies and research knowledge

### Support services needed in I&TT (§3.3.1)

The demand for services in the domain of innovation and technology development from companies can be divided in 3 groups.

1. The main support services needed from more than 40% of companies are in the domain of the recruitment of technology qualified personnel, innovation financing, business support (Technology scouting, Benchmarking, Market survey, commercialisation bootcamps) and databases with technology offers, studies, roadmaps.
2. Around 25%-30% of the companies are looking for support for research contract, innovation management, brokerage events, technology assessment and contacts for innovation partnership.
3. Only 17% need support for IPR issues or other types of services (11%).

The strong demand in the first group for technology qualified personnel, innovation financing and business support is even higher in the sectors **environment, agro-food, biotech and IT&C**.

This strong and diversified demand can be answered in a first step by **specific RDI consultancy projects**, which are flexible and adapted to the specific need of the company. Although this type of services is offered by all the RDI organisations in the region, the demand from the company is still high. This reveals an existing gap. This situation can be improved by two type of measures: a focus on awareness, analysis of needs and matchmaking phases is necessary and also more dedicated resources should be available at the RDI organisations.

A gap can also be observed in the 2<sup>nd</sup> group of services. Especially middle size companies with 51-250 employees have a stronger demand compared to the other categories for support services of the 2nd group in the following domains:

- Research contract (43% compared to an average of 31%)
- Innovation management (41% compared to an average of 31%)
- Brokerage events (41% compared to an average of 29%)
- Technology assessment (33% compared to the other categories)

**This shows that middle size companies with 51-250 employees should be considered as a major target group.**

The demand is also especially high for these services in the sectors **environment, agro-food and IT&C.**

The demand for databases (73%) and innovation management (50%) is much higher for companies with > 250 employees compared to the other categories and in the sectors of IT&C (64%), but also Agro-food (58%) and Textiles & Clothing (50%).

#### Long term vision on innovation (§3.3.3)

It is considered that having a long term vision on innovation shows a high degree of awareness and a high demand for I&TT support to realise this vision.

##### *Product innovation*

54% of the enterprises have a long term vision on product innovation. It is a positive signal because it is more than half of the companies and this shows a big potential for TT&I services in order to support and implement this vision. **The demand for product innovation is especially strong in the sectors Agro-food (70%), Biotech (75%) and Textiles & Clothing (76%).**

##### *Service innovation*

The vision concerning **service innovation** is strongly present compared to product innovation or R&D activities. Nearly 68% of the companies declare to have a long term vision for innovative services. This shows a specific demand for a support in the domain of service innovation in the NE region, especially in the domain of **Tourism, IT&C and Environment.**

Especially in the domain of service innovation **nearly 80%** of the **micro-enterprises** have a vision at long-term. This shows a strong awareness of the enterprises for the importance of innovation, which is success factor for starting TT&I services in this domain.

##### *R&D activities*

Around 40% of the companies have a long term vision on R&D activities, which is less than for the two other domains, but still shows a strong potential corresponding to approx. **300 enterprises.** This especially the case in the sectors IT&C (56%), Biotech (50%) and Environment (49%).

##### *Focus on micro-enterprises*

More micro-enterprises (<10 employees) have a vision concerning innovation in all 3 categories of product innovation, service innovation and R&D activities compared to bigger enterprises. For this reason **specific support should be propose for micro-enterprises** e.g. through consultancy and brokerage events.

### Specific budget for innovation measures

Around 40% of the enterprises have a budget dedicated to innovation. The percentage is especially low in the agro-food sector with only 20% compared to the other sectors.

### Contribution of employees

The role of the employees is especially recognised in the sectors IT&C and Textiles, but not in environment, tourism and agro-food. A change of mentality is necessary in these sectors.

### Systematic method to source and invent new technologies

Only 20% of the companies have a systematic approach to make technology watch and technology scouting. This deficit is especially strong in the sectors of agro-food and environment and in medium sized companies with 10-250 employees.

### Main drivers and barriers to use new technologies and R&D knowledge in products or services

The main drivers to use new technologies or R&D knowledge for new products or services are similar to the objectives stated in §3.2.1, namely:

- Increase performance of existing products / services (67%)
- Increase productivity and competitiveness (67%)
- Reduce manufacturing costs (63%)

To 'reduce the manufacturing costs' is especially strong in the sector of biotech and environment. In the Textiles & Clothing sector to 'increase the performances of existing products' is especially strong.

The main barriers are:

- Equipment costs (63%),
- Qualified staff costs (45%)
- Raw material costs (35%).

This shows the **necessity to have test facilities and FabLabs with shared infrastructures and qualified personnel as service platforms** which can be contracted by the companies. An Individual company cannot afford the necessary investment. The financial risk is too high.

The barrier concerning equipment costs is especially present in the sectors Agrofood, Environment, Textiles and IT&C.

## 2.3 Results of the survey on I&TT services offered

Ten RDI organisations from different types have participated to the survey in the NE region: 3 universities, 7 research organisations, from which 1 define itself as an SME. The organisations have a strong professional experience and are well established. 8 organisations have more than 15 years' experience in research. Only 2 have less. The highest number of research organisations are active in the sectors agro-food, biotechnology and environment. They have expertise in the following technological fields: advanced materials, nanotechnologies and industrial biotechnology.

There activities covers different Technology Readiness Level (TRL). They are mainly active in the range of TRL1 to TRL4 covering fundamental research, proof of concept and validation in the lab. Very few organisations are active in TRL 5 to TRL 7 and none of them in TRL 8 and TRL 9. Companies

are looking for support in high TRL, like TRL 5 to TRL 9 dedicated to validation, demonstration and qualification of technologies and systems in an industrial or operational environment. This shows a gap in the offer of I&TT services.

9 out of 10 research organisations offer services to external organisations mainly to SMEs, public organisations and large companies.

The services related to product/service development are described in the following manner:

- i. All I&TT organisations of the NE region which have participated to the survey propose services in the domain of *Scientific & technological Advice/Expertise/Consultancy*. For 2 of them these services are not open for SMEs.
- ii. Around 50% of the organisations offers services in the following domains:
  - Company visits
  - Innovation partnership agreements
  - Proof of concept / Lab testing of basic experimental set-up/ Characterisation
  - Component/ process development & testing
  - Project management of Research and Innovation projects
- iii. Between 30% and 40% offer services for:
  - Awareness raising events
  - Feasibility Study / initial design / Simulation
  - Prototyping (integrated system/ sub-system) development & testing
  - IPR & Knowledge Management support
  - Co-creation services
- iv. Less than 30% offer services for:
  - Innovation audit
  - Matchmaking events, brokerage events
  - Networking support
  - Living Labs and FabLabs /Pilot line/ demonstration line/ pre-series fabrication
  - Product validation / certification
  - Business plan support

**A deficit of services is especially high in the two last categories of services.**

On the other side these services like matchmaking events, brokerage events, networking support and Living Labs and FabLabs /Pilot line/ demonstration line/ pre-series fabrication or Product validation / certification are very important for companies.

#### **Deficit of services in the different phases**

The following figure shows the services (marked in orange) not sufficiently developed as described in the former paragraph in the different phases of the I&TT process in the collaboration between companies and RDI organisations.

## Deficit of services in the I&TT phases in NE region



Figure 4 – Deficit of services in the different I&TT phases

- The awareness raising phase is not sufficiently developed. The companies need more information and an overview of the services offered.
- The services of innovation audits to analyse the specific needs of the companies is missing.
- More matchmaking events and support for new contacts in different networks are necessary to be more extended.
- In the implementation phase services on product validation & certification, feasibility study & prototyping and co-creation in the frame of FabLabs or Living Labs should be further developed.

Concerning **services opened to SMEs (less than 250 employees)**, differences can be identified in the following domains:

- Awareness raising events (**specific events for SMEs should be organised**)
- Feasibility Study / initial design / Simulation
- Business plan support
- Co-creation services

In a self-assessment perspective, the research organisations show a high interest in supporting SMEs, a good understanding of their needs and a high potential for the development of services in the future. But compared to the answers given by SMEs concerning partnerships with research organisations, a gap appears because only around 10% of the companies have a partnership. The most cited reasons for not having a RDI partnership are: the right partners could not be found, no contact in this domain, not aware about the possibility, lack of information, no opportunity, no institute regionally available in the domain, lack of organisation to support the management of such partnerships, lack of funding, lack of financial resources.

This shows again that the gap is mainly in the domain of awareness, information, support of the partnership process (matchmaking) and financial resources.

## 2.4 Gap analysis

### Objectives of companies vs. services offered by research organisations

As already explained (and described more in details in § 2.2.1.1), five objectives have been appointed by more than 60% of the companies. Three of the most quoted objectives for the near future are related to the *internal development* of the companies:

- Improve product/service quality (68%)
- Reduce production costs (75%)
- Reduce energy consumption (65%)

Two of them are related to the *business development* of the companies:

- Enter new markets or increase market share (63%)
- Improve company's networks (75%)

#### **Internal development**

The objectives related to the *internal development* can be addressed mainly by **process innovations**. The following I&TT services in the categories "*Knowledge*" and "*Equipment*" can support them:

- *R&D consultancy* and *simulation* on quality improvement and smart production e.g. to reduce production time and energy consumption
- *Process development and testing*
- *Living labs, Fablabs* to test the quality and the new production steps

The results of §4.2.2 (*Question 3.2*) of the I&TT offer study show that:

- *R&D consultancy* services is offered by all the I&TT organisations in the region
- *Process development and testing* is proposed by more than 50%
- *Living labs, FabLabs* services only by 1 out of 9 organisations

**The existing gaps are in the two domains of services:**

- *Process development and testing*
- *Living labs, FabLabs*

It is particularly important to bridge these gaps in the sectors Agro-food, Bio-Tech, Environment and IT&C, in which the demand to improve product quality is especially high.

Furthermore these gaps are underlined by the fact that the results of § 4.1.5 (*Question 2.7 of the I&TT offers questionnaire*) **on TRLs**, shows that less than 30% of I&TT organisations of the region propose services for TRL6 and TRL7, and even none of them for TRL 8 and TRL9, which correspond to services for demonstration, field-tests and qualification near to market-entry.

The list of the main drivers and barriers for the use of new technologies and R&D knowledge in new products and services in §3.3.8.1 (*Q3.8 need questionnaire*) is supporting this analysis.

#### **Business development**

The two former objectives related to *business development* can be addressed mainly by the following I&TT services in the category "*Contact*":

- *Awareness raising events*
- *Matchmaking events, brokerage events*



- *Networking support*
- *Innovation Partnership Agreement*

The results of §4.2.2 (*question 3.2 of the I&TT offers questionnaire*) show that gaps are especially large in the 3 following services, which are offered by less than 30% of the I&TT organisations of the region: *Awareness raising events, Matchmaking & brokerage events, Networking support*.

Services concerning the support of *Innovation Partnership Agreement* are proposed by around 50% of I&TT organisations.

Services chosen by companies vs. services offered by RDI organisations

The demand from companies for I&TT services can be divided in 3 groups as described in Figure 5.

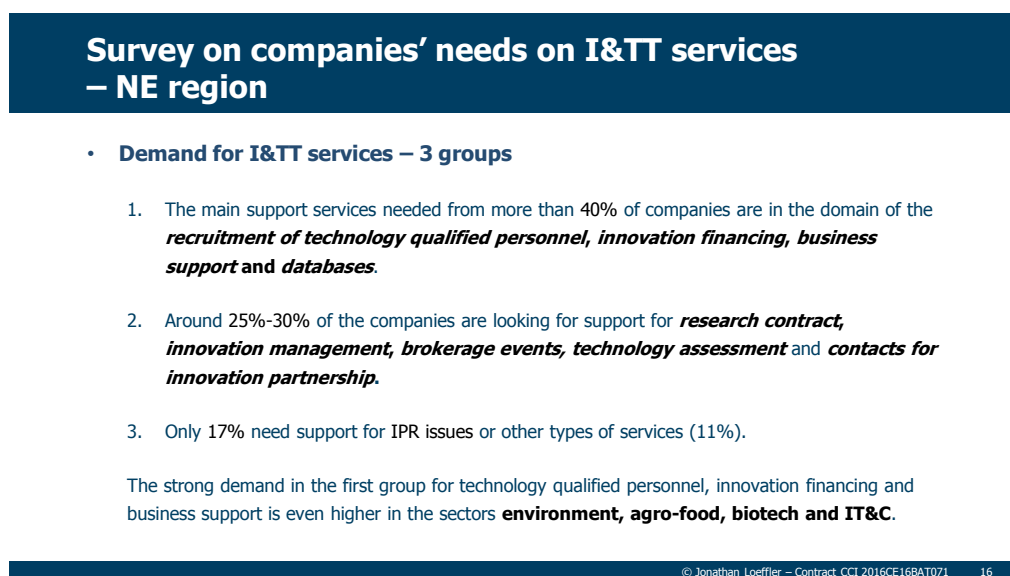


Figure 5 - Overview on the services asked by companies

#### POSSIBLE ANSWER TO THE DEMAND FOR I&TT SERVICES IN 1ST GROUP

The demand for I&TT services in the 1<sup>st</sup> group can be answered in a first step by **specific RDI consultancy projects**, which are flexible and adapted to the specific need of the company. Through RDI consultancy, the lack of qualified personnel for R&D product development can be partially answered on the development of collaborative projects. Although this type of services is offered by all the RDI organisations in the region, the demand from the company is still high. **RDI consultancy should be further developed.**

This situation can be improved by two types of measures:

1. **A focus on awareness, analysis of needs and matchmaking phases** is necessary;
2. **More dedicated resources** should be available at the RDI organisations to answer the strong demand.

There is also a strong demand in the domain of *innovation financing and business support* (including technology scouting, benchmarking, market survey). These sort of services like *business plan support* are offered only by a very few number of RDI organisations in the NE region and should be further developed.

POSSIBLE answer to the demand for I&TT services in 2<sup>nd</sup> group

A gap can also be observed in the 2<sup>nd</sup> group of services. Especially middle size companies with 51-250 employees have a stronger demand compared to the other categories for support services of the 2<sup>nd</sup> group in the following domains:

- **Research contract** (43% compared to an average of 31%)
- **Innovation management** (41% compared to an average of 31%)
- **Brokerage events** (41% compared to an average of 29%)
- **Technology assessment** (33% compared to the other categories)

This shows that middle size companies with 51-250 employees should be considered as a major target group.

Furthermore **brokerage events** is only proposed as a service by less than 30% of the RDI organisations (Figure 6).

A gap also exists in the domain of **technology assessment** which includes innovation audits and are also only offered by less than 30% of the RDI organisations (Figure 6).

I&TT services offered by RDI organisation (2) - NE Region		
<ul style="list-style-type: none"> <li>• All I&amp;TT organisations of the NE region which have participated to the survey propose services in the domain of <b>Scientific &amp; technological Advice/Expertise/Consultancy</b>.</li> </ul>		
<p>Around 50% of the organisations offer services for:</p> <ul style="list-style-type: none"> <li>• Company visits</li> <li>• Innovation partnership agreements</li> <li>• Proof of concept / Lab testing of basic experimental set-up/ Characterisation</li> <li>• Component/ process development &amp; testing</li> <li>• Project management of Research and Innovation projects</li> </ul>	<p>Between 30% and 40% offer services for:</p> <ul style="list-style-type: none"> <li>• Awareness raising events</li> <li>• Feasibility Study / initial design / Simulation</li> <li>• Prototyping (integrated system/ sub-system) development &amp; testing</li> <li>• IPR &amp; Knowledge Management support</li> <li>• Co-creation services</li> </ul>	<p>Less than 30% offer services for:</p> <ul style="list-style-type: none"> <li>• Innovation audit</li> <li>• Matchmaking events, brokerage events</li> <li>• Networking support</li> <li>• Living Labs and FabLabs / Pilot line/ demonstration line/ pre-series fabrication</li> <li>• Product validation / certification</li> <li>• Business plan support</li> </ul>

© Jonathan Loeffler – Contract CCI 2016CE16BAT071 23

Figure 6 – Overview of services offered at different levels by RDI organisations

### 3 Analysis of results from the on-line questionnaire concerning companies' I&TT needs

The questionnaire had the following three main parts:

- Part 1 - Company profile
- Part 2 - Company's objectives and partnerships
- Part 3 - Innovation management, new technologies and research knowledge

The structure gives the possibility to make some statistics for the different types of companies concerning their specific needs.

#### 3.1 Section 1 - Profile of the companies participating to the survey in the NE Region

In order to have a representative sample of companies for the survey, it is important to address different types of companies considering the following factors:

- Creation date
- Size and turnover
- Involvement in RDI activities
- Economic sectors
- Role in the value chain

An initial sample of companies were identified by the expert based on the RDA database and on the priorities of the S3 regional strategy.

Considering the statistics of the NE region given by the RDA, the number of companies compared to the number of employees are the following:

- 0-9 persons – 49.041 companies
- 10-49 persons – 6.005 companies
- 50-249 persons – 951 companies
- 250 persons and more – 157 companies

In order to have a representative sample of companies, it is proposed to send the questionnaire to all the 1.108 companies having more than 50 employees independently from their sector of activities with the exception of the trade and financing sector. The answer to the questions in section 1 of the questionnaire will give the possibility to differentiate the needs in the different economic sector.

Because the number of companies having less than 50 employees is very high with more than 55.000 companies, the questionnaire will only be sent to companies active in specific sectors related to the 6 RIS3 priorities in the NE region. **The choice of companies is presented in the Excel document named “Sampling of companies per RIS3 priority JL”**

For this reason the survey will be sent:

- to companies having more than 50 employees independently from the sector of activity;
- to companies having less than 50 employees in specific sectors related to the 6 RIS3 priorities in the NE region (Agro-food, Textiles & Clothing, IT&C, Biotechnologies, Environment, Tourism).

The following table gives an overview of the number of companies in each RIS3 area identified during the sampling process based on the database of the Regional Development Agency:

	Total	Size (Nb of employees)			
		0-9	10-49	50-249	>= 250
Agro-food	<b>383</b>	127	146	96	14
Textiles & Clothing	<b>223</b>	169	33	15	6
ICT	<b>86</b>	4	65	15	2
Biotechnologies	<b>85</b>	4	64	15	2
Environment	<b>473</b>	220	167	63	23
Tourism	<b>465</b>	0	76	308	81
<b>TOTAL</b>	<b>1715</b>	<b>524</b>	<b>551</b>	<b>512</b>	<b>128</b>
%	100%	31%	32%	30%	7%

### 3.1.1 Section 1.1 - Creation date

Table 1 – Distribution of the companies depending on their date of creation

Creation date	Number of companies	%
< 2 years	8	1%
2 - 5 years	27	3%
> 5 years	748	96%
<b>TOTAL</b>	<b>783</b>	<b>100%</b>

783 companies have participated to the survey. This number of companies is a representative sample of the regional companies and gives the possibility to make statistics from the different type of companies.

96% of the companies are established companies older than 5 years. Only 3% were 2-5 years old and 1% less than 2 years old and can be considered as start-up.

### 3.1.2 Section 1.2 - Size of the company

Their size (number of employees or turnover) helps to differentiate between micro-enterprises, SMEs or big companies.

Table 2 – Number of companies depending on their number of employees

Number of employees	Number of companies	% of total answers	Initial sample of companies identified	% of identified companies	Representability of the answers (%)
< 10	198	25%	524	31%	38%
10-50	394	50%	551	32%	72%
51-250	165	21%	512	30%	32%
>250	26	3%	128	7%	20%
<b>TOTAL</b>	<b>783</b>	<b>100%</b>	<b>783</b>	<b>100%</b>	<b>46%</b>

**Representability** - Comparison of the number of answers in the different categories of size with the initial sampling of companies identified to be relevant to answer the questionnaire chosen at the beginning of the survey.

46% of the total number of companies initially identified answered the questionnaire, which is a very good score and demonstrate a very good representability of the answers received during the survey. The representability is especially high with 72% for the companies having 10-50 employees. For companies with more than 250 employees, 20% answered the questionnaire, which is still sufficient for statistical purposes.

### 3.1.3 Section 1.3 - Involvement in RDI activities

The European Commission distinguished different types of companies depending on the intensity of their RDI activities:

- i. **Technology pioneers** – they represent in average only 1-2% of the total number of SMEs in Europe
- ii. **Early technology followers**, pioneers in implementation - they represent in average only 3-5% of the total number of SMEs in Europe
- iii. **Late technology followers** - they represent in average only 10% of the total number of SMEs in Europe
- iv. **Technology users** (in average 80%)

In order to evaluate the involvement of the companies in RDI activities, the percentage of the total staff working in the R&D department or in RDI activities will be used as a criteria to distinguish between different types of companies:

1. If more than 15% of the staff is working in RDI activities, the companies will be considered as *Technology pioneers*
2. If 11-15% of the staff is working in RDI activities, the companies will be considered as *Early technology followers*
3. If 5-10% of the staff is working in RDI activities, the companies will be considered as *Late technology followers*
4. If less than 5% of the staff is working in RDI activities, the companies will be considered as *Technology users*

Table 3 – Statistical distribution of companies depending on the percentage of RTD staff

Section 1.3 - Number of RTD staff (%)	Number	%	Type of companies
< 5%	742	95%	Late followers and technology users
5-10%	24	3%	Technology pioneers and early followers
11-15%	11	1%	
> 15%	6	1%	
<b>Total</b>	<b>783</b>	<b>100%</b>	

For statistical reasons, the two categories “Technology pioneers” and “Early technology followers” as well as “Late technology followers” and “Technology users” will be considered together.

The number of late followers and technology users is high with 95%.

### 3.1.4 Section 1.4 – Turnover

Table 4 - Statistical distribution of companies depending on turnover

<b>1.4 Annual turnover (in Mio €)</b>	<b>Number of companies</b>	<b>%</b>
< 1	501	64%
1-10	225	29%
11-50	47	6%
> 50	10	1%
<b>TOTAL</b>	<b>783</b>	<b>100%</b>

More than 60% of the companies have an annual turnover under 1 Mio. EUR, around 30% in the range 1-10 Mio EUR and 7% more than 10 MIO. EUR.

Average costs of one cooperation contract with ITT service suppliers is between 5.000 – 10.000 EUR. For the companies having a turnover higher than 1 Mio. EUR, if we consider these costs in relation to the turnover, the costs of the ITT services should not be a strong barrier representing less than 1% of the turnover. It is more a need to change SMEs mentality in respect to ITT services.

### 3.1.5 Section 1.5 - Economic sector

Table 5 - Statistical distribution of companies depending on economic sectors

1.5 Economic sector	Number of companies	%
Agro-food	191	24%
Biotechnology (Bio Chem Tech)	40	5%
Environment	88	11%
IT&C	50	6%
Others	108	14%
Textiles & Clothing	38	5%
Tourism	266	34%
N.A.	2	
<b>Total</b>	<b>783</b>	<b>100%</b>

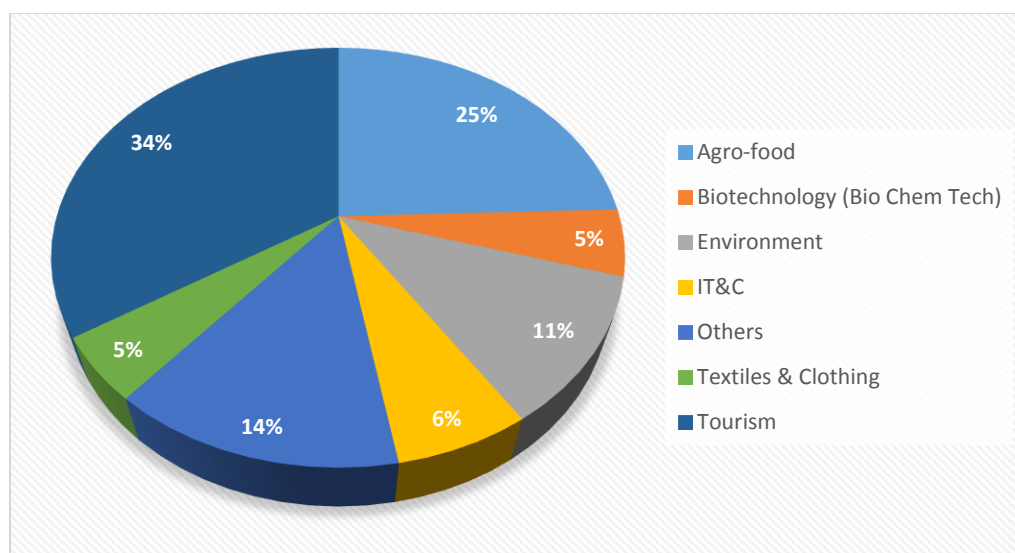


Figure 7 – Percentage of companies from the different economic sectors<sup>3</sup>

Table 6 - Statistical distribution of companies depending on economic sectors and number of employees

Economic sector	Number of employees					%
	< 10	10-50	51-250	>250	Total	
Agro-food	39	109	36	7	191	24%
Biotechnology (Bio Chem Tech)	10	24	6		40	5%
Environment	19	46	17	6	88	11%
IT&C	12	26	10	2	50	6%
Others	14	31	55	8	108	14%
Textiles & Clothing	7	18	11	2	38	5%
Tourism	95	140	30	1	266	34%
N.A.	2				2	0%
<b>Total</b>	<b>198</b>	<b>394</b>	<b>165</b>	<b>26</b>	<b>783</b>	

<sup>3</sup> Under the sector tourism are also considered companies which are delivering generic services (like transport of goods and persons, bus, car renting...), which increase the representability of this sector in the survey

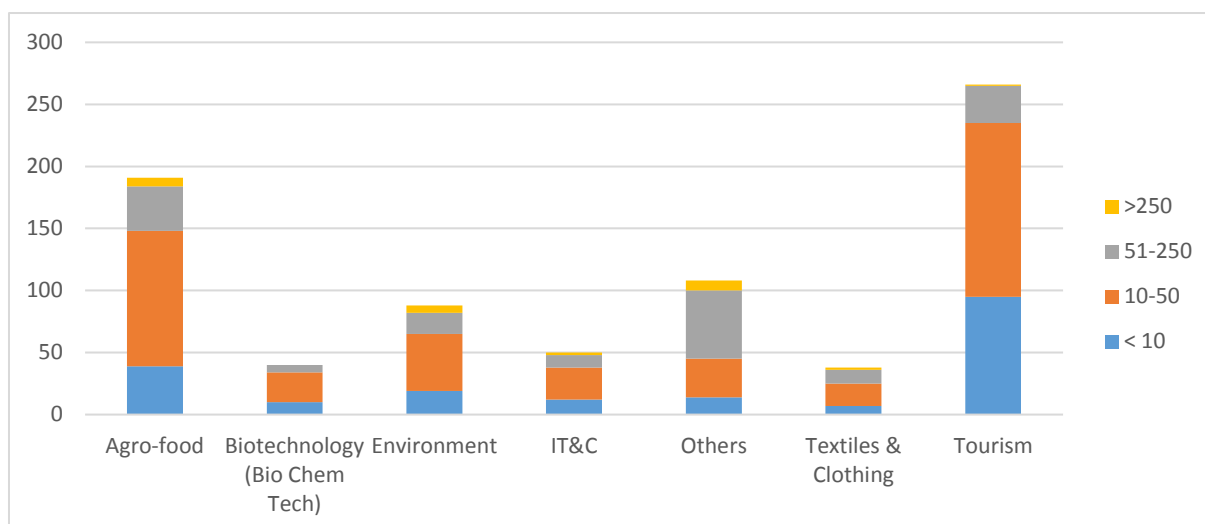


Figure 8 – Quantitative distribution of company size in the different economic sectors

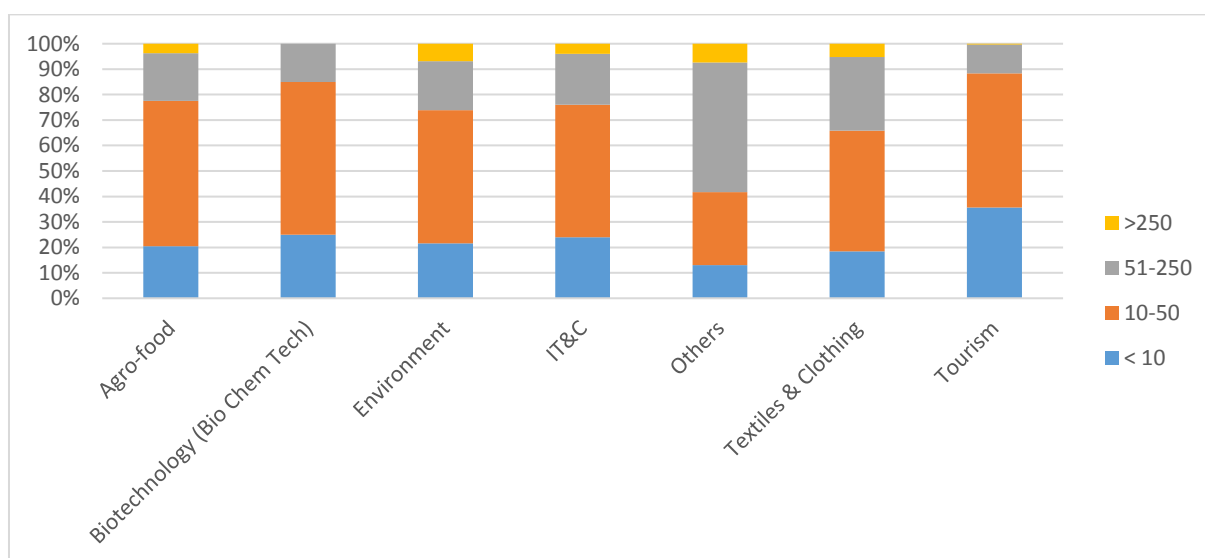


Figure 9 – Percentage of companies in each sector depending on the number of employees

In conclusion, most of interviewed companies are from the Agrofood and Tourism<sup>4</sup> sectors.

The distribution of the companies per dimension indicates that most representative group of companies in all sectors includes small and medium companies (between 10-250 employees) **that should represent the main target group of clients for ITT service suppliers.**

### 3.1.6 Role in the value chain

The following statistics show the role of companies in the value chain as *Developer*, *Producer* or *User*. In order to have the possibility to absorb new knowledge and to implement it in new products or services, the companies have to be of a certain size and/or have internal competences in new technologies through the presence of qualified high level technicians, engineers or scientists.

<sup>4</sup> Under the sector tourism are also considered companies which are delivering generic services (like transport of goods and persons, bus, car renting...), which increase the representability of this sector in the survey



### 3.1.6.1 Developers

Table 7 – Distribution of developers

Developers of	Number of companies	%
Services	228	72%
Materials	104	33%
Fabrication technologies	87	28%
Devices/components	35	11%
<b>Total of developers</b>	<b>315</b>	<b>47%</b>
Total of 'NOT developers'	350	53%
TOTAL of answers	665	100%

(Multiple choices were allowed, for this reason the total of answers can be higher than the total in the different domains of development.)

315 companies (47%) are developers, **mainly from services** (228 companies representing 72%). The other domains in the value chain represent 'materials' (104, 33%), 'fabrication technologies' (87, 28%) and 'devices/components' (35, 11%).

### 3.1.6.2 Producers

Table 8 – Distribution of producers

Producers of	Number of companies	%
Services	484	68%
Materials	275	38%
Fabrication technologies	55	8%
Devices/components	51	7%
<b>Total of producers</b>	<b>715</b>	<b>95%</b>
Total of 'NOT producers'	41	5%
TOTAL of answers	756	

(Multiple choices were allowed, for this reason the total of answers can be higher than the total in the different domains of production.)

Nearly 70% of the producers are in the domain of services and 40% in the domain of materials

### 3.1.6.3 Users

Table 9 – Distribution of users

Users of	Number of companies	%
Materials	674	86%
Services	650	83%
Devices/components	605	77%
Fabrication technologies	383	49%
<b>TOTAL of answers</b>	<b>783</b>	

(Multiple choices were allowed, for this reason the total of answers can be higher than the total in the different domains of users.)

In conclusion, most of the companies are developer of services (72%) and producer of services (68%) all companies being users of services (83%), materials (86%) and devices/components (77%). The ITT services should consider their market strategy according to this positioning of potential clients. This shows also the importance to consider service innovation support in the NE region.

## 3.2 Section 2 – Company’s objectives and partnerships

### 3.2.1 Company’s objectives for the near future in regard to (multiple choice possible)

#### 3.2.1.1 All sectors

##### Products / services

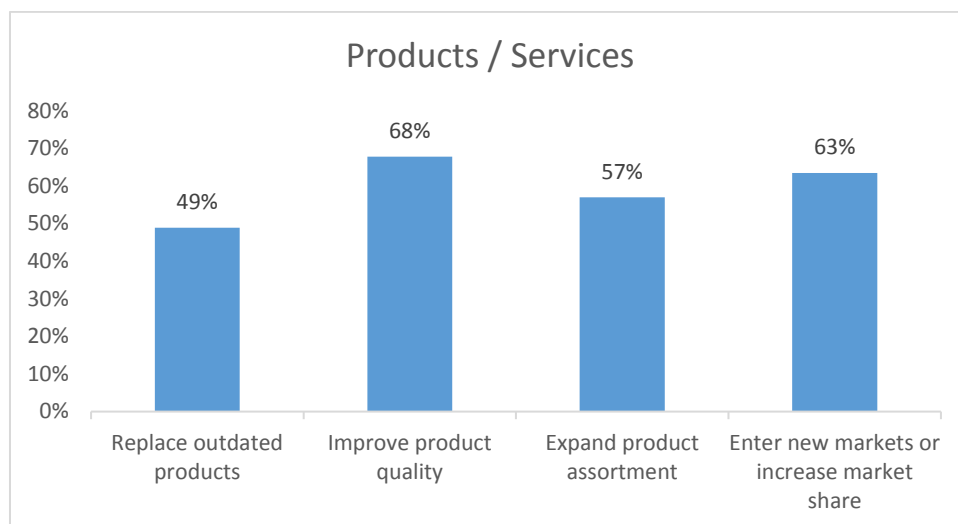


Figure 10 - Distribution of objectives in the domain of products/services

In the domain of Products/Services the focus of the objectives are on *improve product quality* and *enter new markets or increase market share*.

In order to improve the product quality, the companies mainly need support to acquire new knowledge and equipment. The I&TT services link to these two domains are (Figure 2):

- i. R&D consultancy, feasibility tests, prototyping
- ii. FabLabs, manufacturing agreements

## Business operations

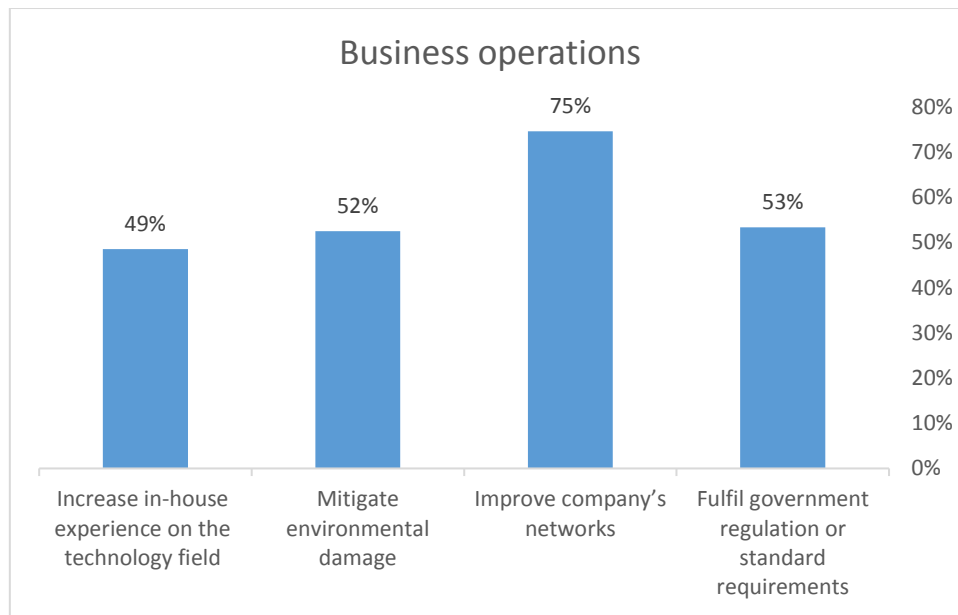


Figure 11 - Distribution of objectives in the domain of Business operations

In the domain of Business Operations, the focus of the on improvement of company's network can be observed.

## R&D / processes

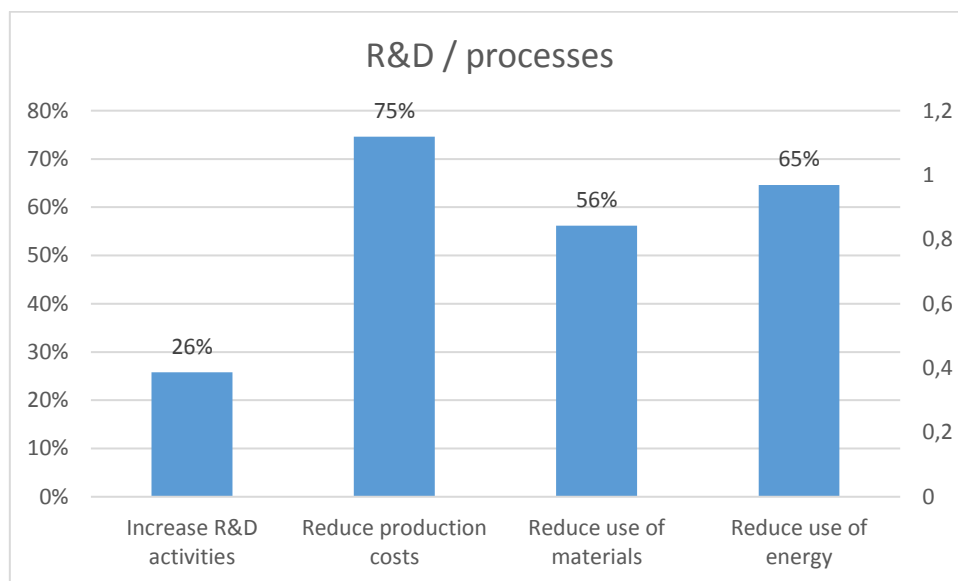


Figure 12 - Distribution of objectives in the domain of R&D / processes

A focus on reduction of production and energy costs can be noticed. Only around 25% of the companies plan to increase specifically their R&D activities, corresponding to R&D intensive companies.

Considering the 3 phases in the product life cycle: (i) the **product/service development phase** before market entry, and after market entry (ii) **the production phase** and (iii) **the business development phase**, the importance of the objectives for the companies in the NE region can be listed the following way<sup>5</sup>:

1. For the *product/service development* phase (before market entry)
  - a. Expand product assortment (57%)
  - b. Fulfill governmental regulation or standard requirements (53%)
  - c. Mitigate environmental damage (52%)
  - d. Replace outdated products (49%)
  - e. Increase in-house experience on the technology field (49%)
  - f. Increase R&D activities (26%)
2. For the *production process* phase (after market entry)
  - a. **Reduce production costs (75%)**
  - b. **Improve product quality (68%)**
  - c. **Reduce use of energy (65%)**
  - d. Reduce use of materials (56%)
  - e. Fulfill governmental regulation or standard requirements (53%)
  - f. Mitigate environmental damage (52%)
3. For the *business development* phase
  - a. **Improve company's network (75%)**
  - b. **Enter new markets or increase market shares (63%)**
  - c. Expand product assortment (57%)

## Conclusions

From the data presented above, five objectives have been appointed by more than 60% of the companies.

Three of the most quoted objectives for the near future are related to the *internal development* of the companies:

- Improve product/service quality (68%)
- Reduce production costs (75%)
- Reduce energy consumption (65%)

Two of them are related to the *business development* of the companies:

- Enter new markets or increase market share (63%)
- Improve company's networks (75%)

This information is very important for the definition of the profile of potential ITT service providers, which should offer services linked to the priorities of companies, in order to support them to achieve their objectives. In this way the acceptance for ITT services can be significantly increased.

---

<sup>5</sup> Some objectives are relevant for more than one phase. For this reason they are listed several times.

## Analysis of gaps

### **Internal development**

The objectives related to the *internal development* can be addressed mainly by process innovations. The following I&TT services in the categories “*Knowledge*” and “*Equipment*” can support them:

- *R&D consultancy and simulation* on quality improvement and smart production e.g. to reduce production time and energy consumption
- *Process development and testing*
- *Living labs, Fablabs* to test the quality and the new production steps

The results of §4.2.2 (*Question 3.2*) of the I&TT offer study show that:

- *R&D consultancy* services is offered by all the I&TT organisations in the region
- *Process development and testing* is proposed by more than 50%
- *Living labs, Fablabs* services only by 1 out of 9 organisations

**The existing gaps are in the two domains of services:**

- *Process development and testing*
- *Living labs, Fablabs*

Furthermore these gaps are underlined by the fact that the results of § 4.1.5 (*Question 2.7 of the I&TT offers questionnaire*) on **TRLs**, shows that **less than 30% of I&TT organisations of the region propose services for TRL6 and TRL7, and even none of them for TRL 8 and TRL9**, which correspond to services for demonstration, field-tests and qualification near to market-entry.

### **Business development**

The two former objectives related to *business development* can be addressed mainly by the following I&TT services in the category “*Contact*”:

- *Awareness raising events*
- *Matchmaking events, brokerage events*
- *Networking support*
- *Innovation Partnership Agreement*

The results of §4.2.2 (*question 3.2 of the I&TT offers questionnaire*) of the I&TT offer study show that gaps are especially large in the 3 following services, **which are offered by less than 30% of the I&TT organisations of the region:**

- *Awareness raising events*
- *Matchmaking events, brokerage events*
- *Networking support*

Services concerning the support of *Innovation Partnership Agreement* are proposed by around 50% of I&TT organisations.

### 3.2.1.2 Sector specific results

#### Objectives concerning products / services

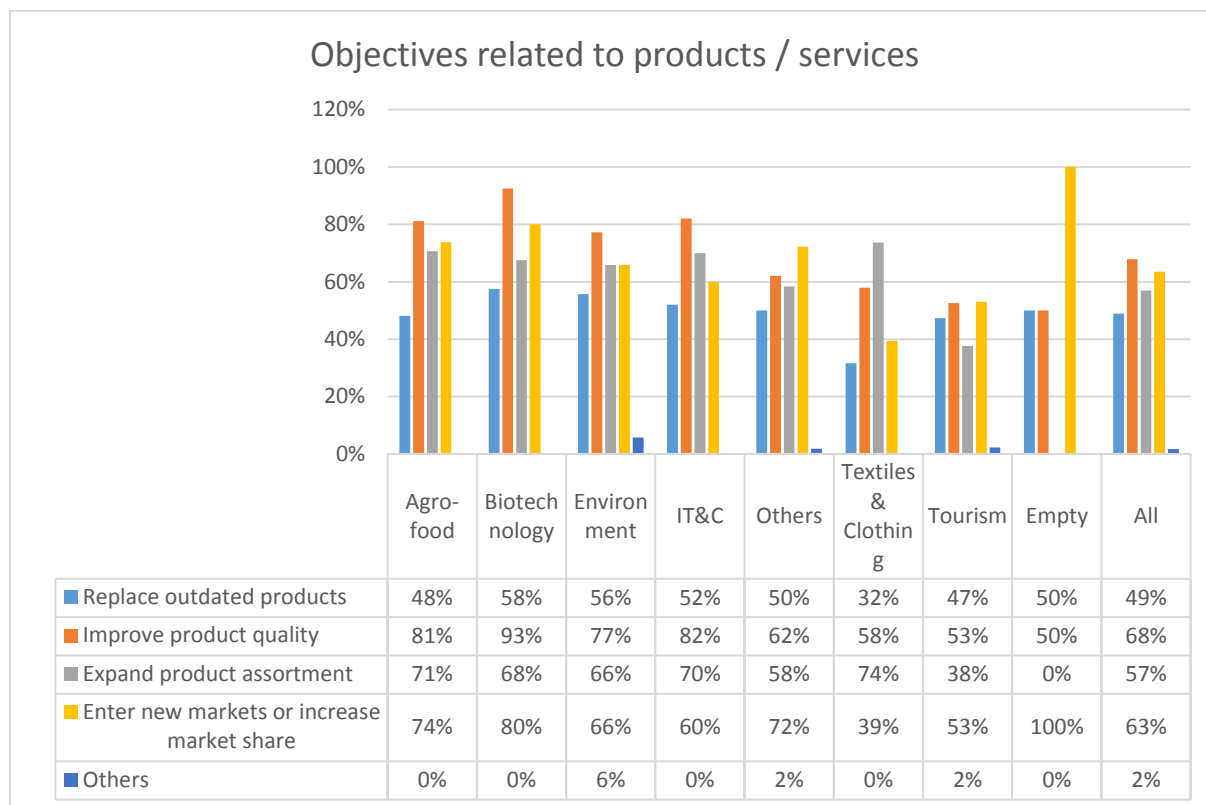


Figure 13 – Objectives related to products and services in the different sectors

Compared to the results obtained for all companies in all sectors, the following differences can be noticed in specific sectors:

- In the *Agro-food, Bio-Tech, Environment and IT&C* sectors, the objective concerning the **“improvement of product quality”** is very high.
- In the *IT&C and Textiles & Clothing* sectors, **the objectives to ‘Replace outdated products’ and ‘Enter new markets’ have a lower priority** compared to other sectors.
- The objective to **‘Expand product assortment’** is stronger in the sectors ‘Textile & Clothing’, ‘IT&C’ and ‘Agro-food’.
- The objective to **‘Enter new markets or increase the market share’** is especially strong in the sectors ‘Agro-food’ and ‘Biotech’.

## Objectives concerning business operations

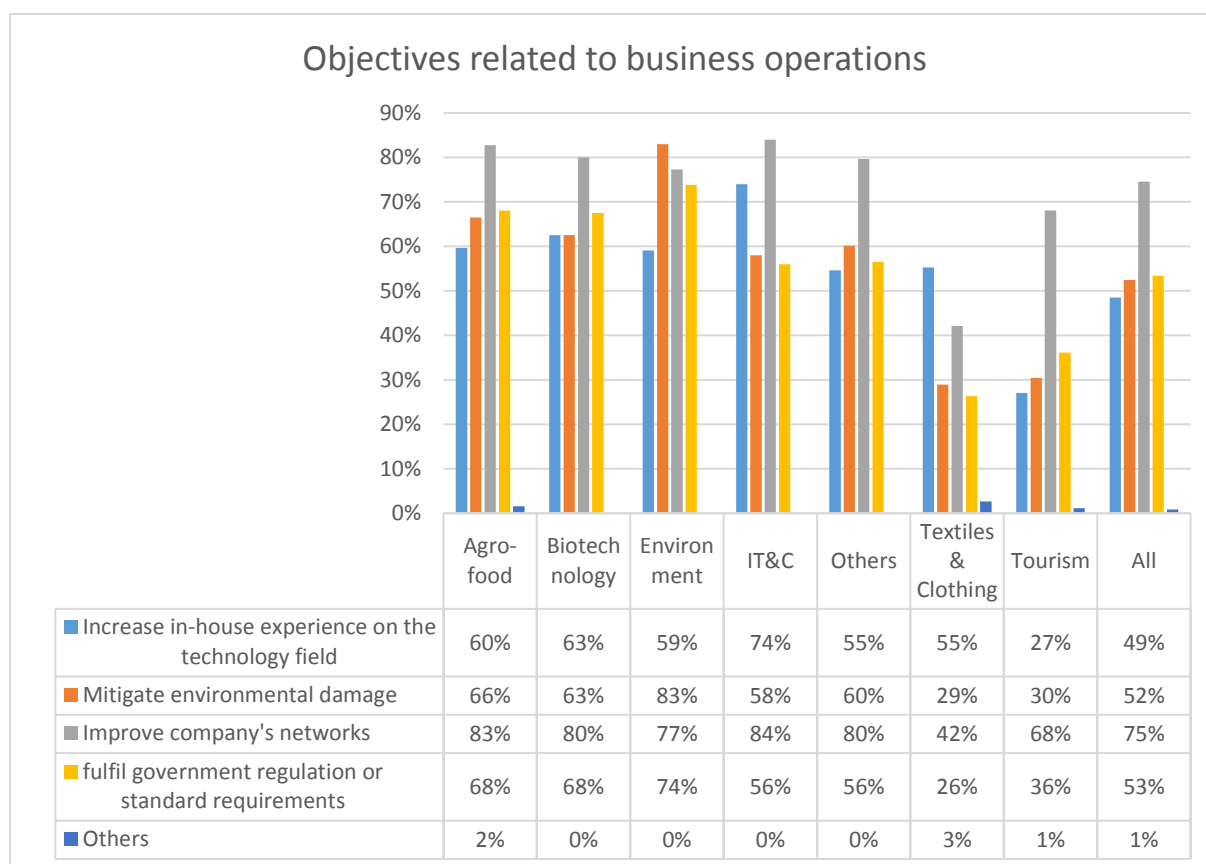


Figure 14 – Objectives related to business operations in the different sectors

Compared to the results obtained for all companies in all sectors, the following differences can be noticed in specific sectors:

- In the *Environment* sector, the objectives concerning the “**mitigation of environment damage**” and the “**fulfilment of government regulation or standard requirements**” have obviously higher priorities.
- In the *IT&C* and *Textiles & Clothing* sectors, **the objective to increase in-house experience on technology field is a stronger priority** compared to other sectors.

## Objectives concerning R&D and processes

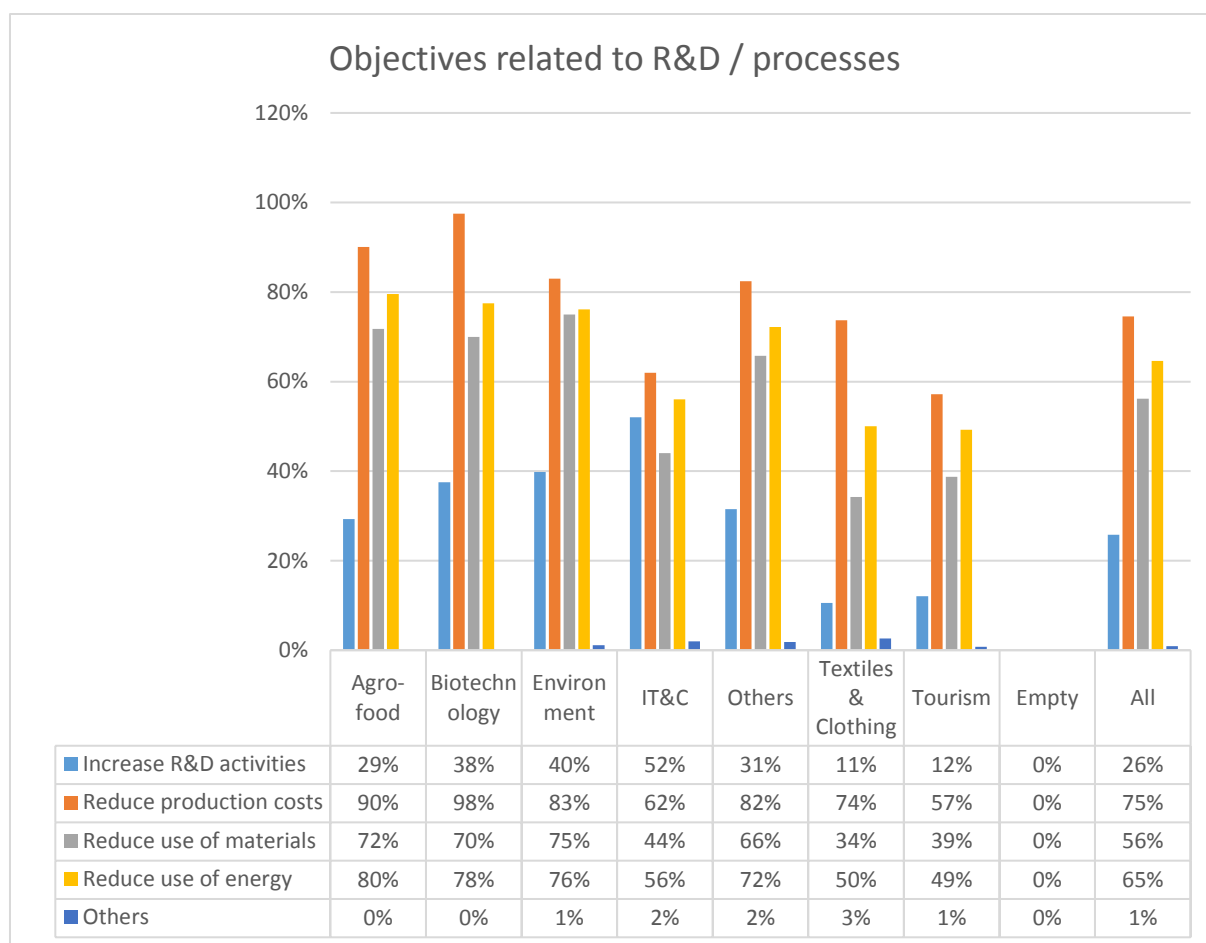


Figure 15 – Objectives related to R&D/Processes in the different sectors

Compared to the results obtained for all companies in all sectors, the following differences can be noticed in specific sectors:

- **Increase R&D activities** is especially strong in the domain of *IT&C* (52%), *Environment* (40%) and *Biotechnology* (38%) compared to an average of 26% in all sectors.
- **Reduce production costs, reduce use of materials and energy** is of higher priority in the sectors of *Bio-Tech*, *Agro-food* and *Environment* compared to the average in all sectors.

**It can be defined from the info above a clear profile of the client needs in each sector, info that should be carefully exploited by the ITT developers within PA1 Promotion of ITT ROP 2014-2020.**



### 3.2.2 Partnership in the domain of research, technological development and innovation

#### 3.2.2.1 All sectors

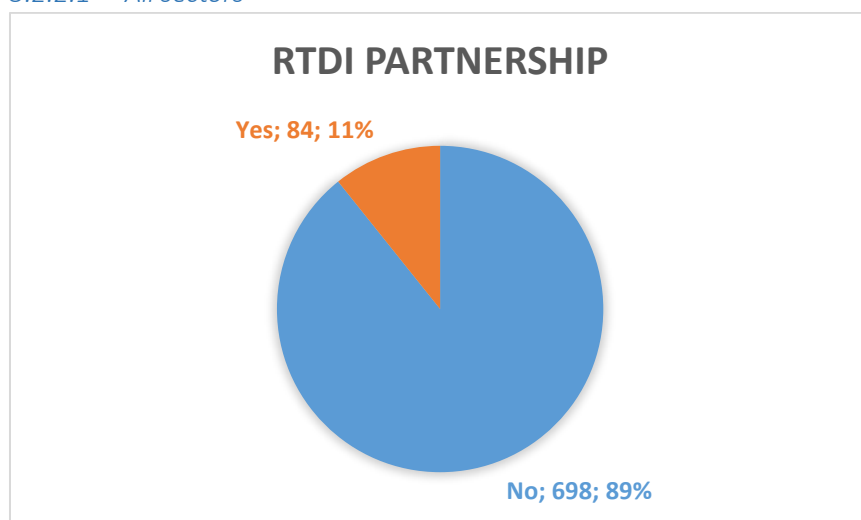


Figure 16 – RDI partnerships

**About 90%** of the companies do not have a partnership in the domain of research, technological development and innovation (RDI).

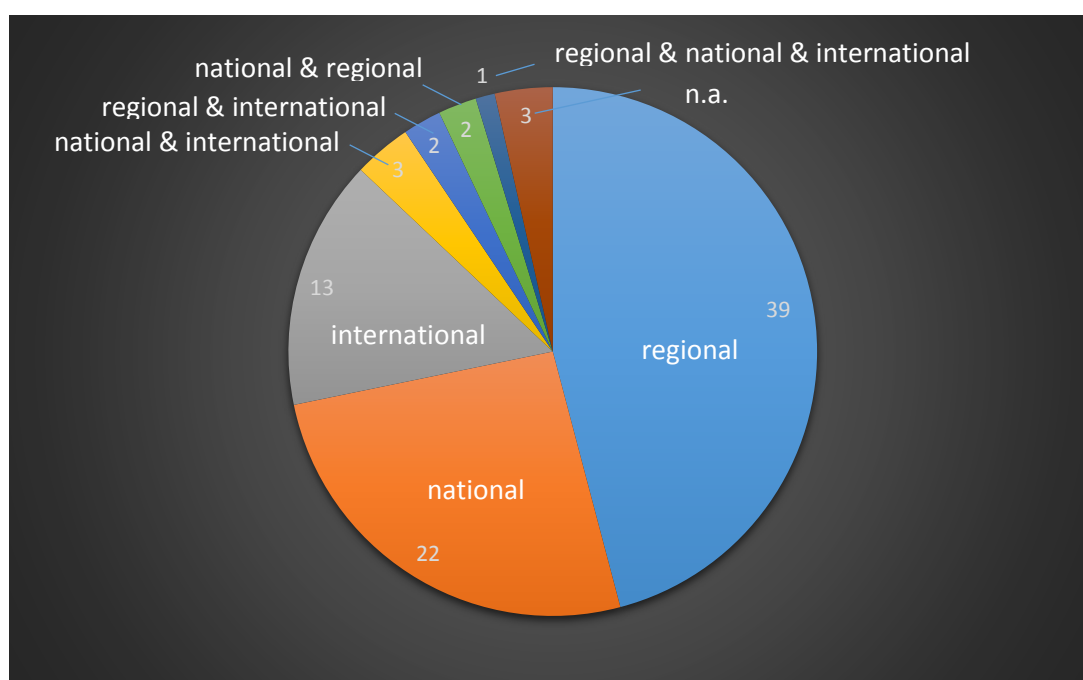


Figure 17 – Number of companies having RDI partnerships at different geographical level

The 10% of companies having RDI partnerships have it mainly at regional and national level. Very few companies have partnerships at two level. **Only one** company has cooperation at regional, national and international level.

In relation to the size of companies

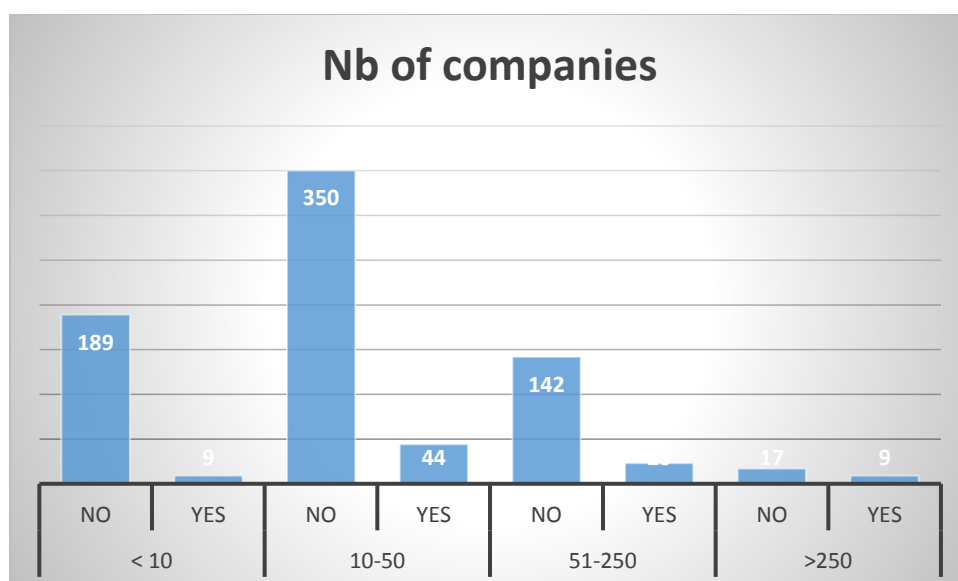


Figure 18 – Number of companies having RDI partnerships in relation to the size of the companies

The percentage of companies having RDI partnerships increases with the size of the company: 5% for companies with < 10 employees, 11% for companies with 10-50 employees, 14% for companies with 51-250 employees and 35% for companies with >250 employees.

This indicates that the main target group of the ITT service suppliers supporting cooperation should be the small and medium companies with less than 250 employees.

### 3.2.2.2 With which type of organisation?

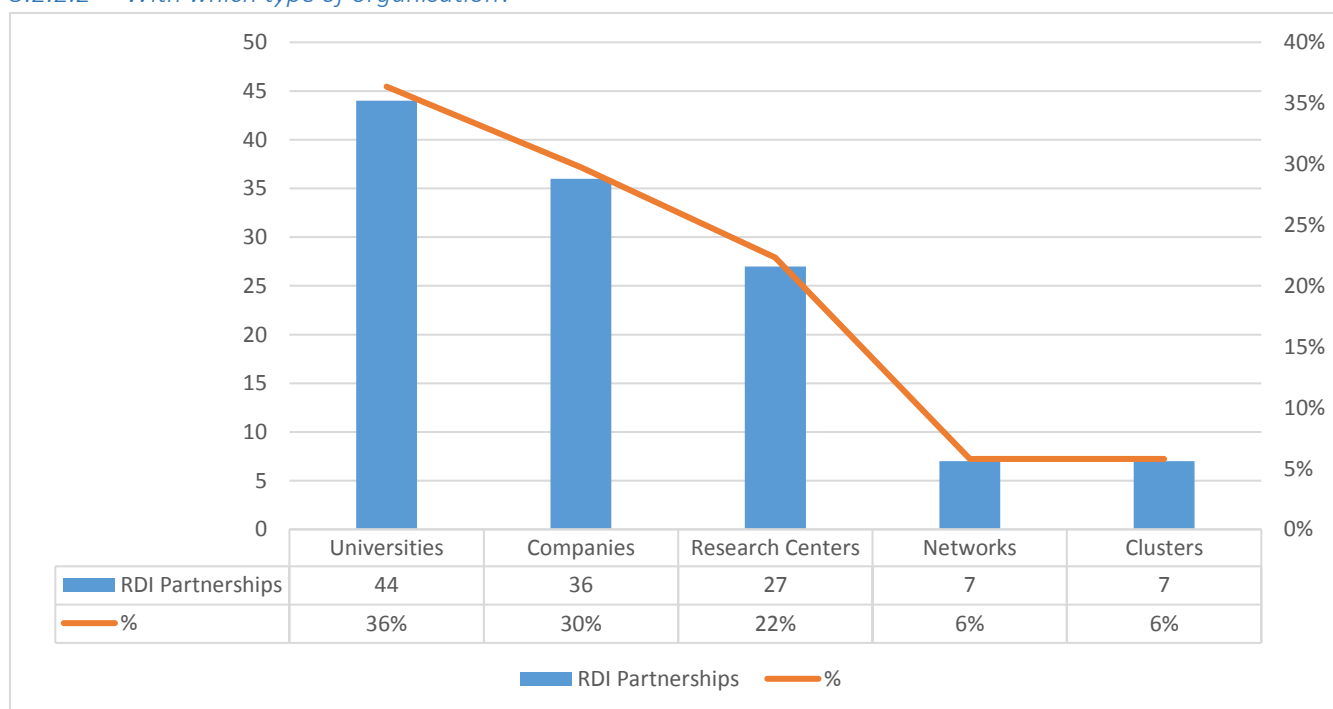


Figure 19 – Number and percentage of companies having RDI partnerships with different types of organisations

Around 60% of the partnerships are with universities or research centres. 30% of the partnerships are with other companies and 10% with other organisations. **This information indicates that there is**

**a big potential in the collaboration with networks and clusters, which should be a significant counterpart of ITT service suppliers to work with on their market development.**

### 3.2.2.3 Sector specific analysis

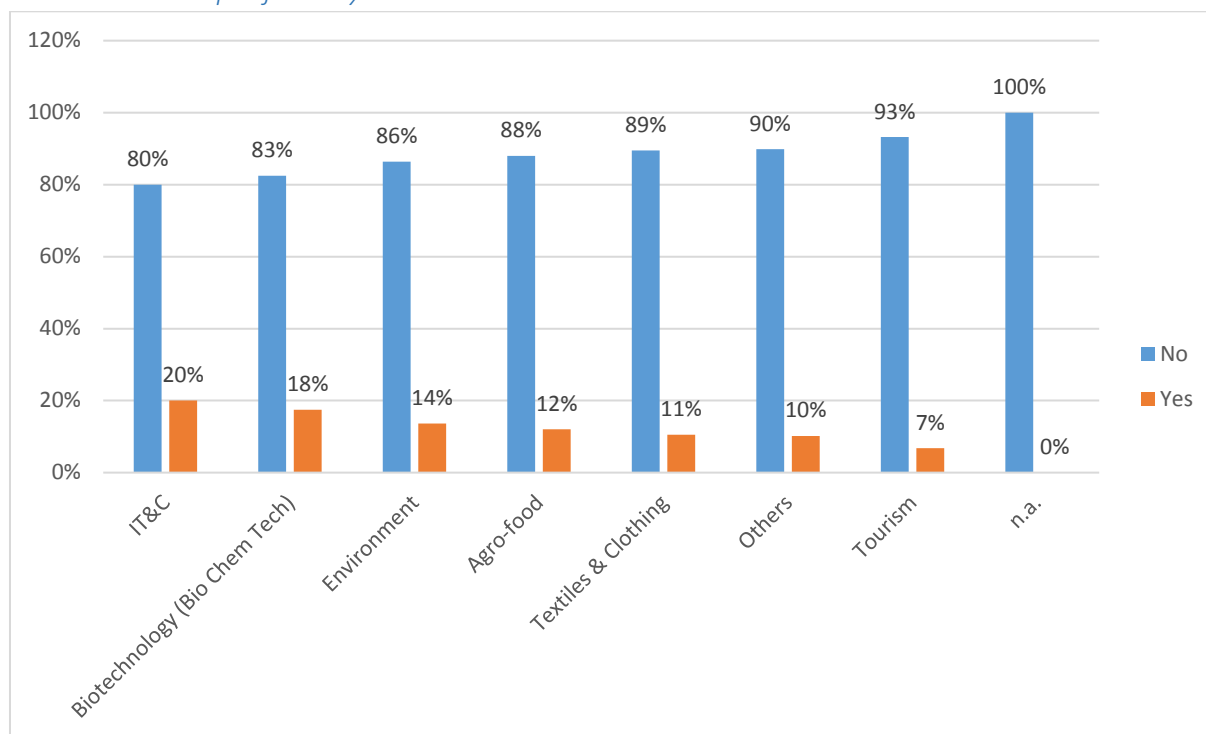


Figure 20 – Percentage of companies having or not having RDI partnerships

In total 85 companies have already partnerships with RDI organisations.

Representing the % of companies with RDI partnership reflects the intensity of this cooperation at sector level.

In the ICT and BioTech sectors the highest percentage of companies have already partnership in the RDI domain. The lowest percentage is in the domain of Tourism.

### 3.2.2.4 Reasons for not having a RDI partnership

The most cited reasons for not having a RDI partnership are the following:

- It does not suit to the company, company is not ready, no interest of the management at that time or no necessity at the moment
- Not aware about the possibility, lack of information, no opportunity,
- Lack of organisation to facilitate and to support the management of such RDI partnerships, no institute regionally available in the domain
- Involve large costs, lack of funding, lack of financial resources
- Lack of human resources, company is too small
- R&D department was recently set up
- Could not find the right partners, no contact in this domain
- Risk concerning IPR

These topics should be included in the content of all **awareness services** to be developed by the ITT suppliers.

#### *3.2.2.5 Interest to join RDI projects*

From the companies not having RDI partnerships yet, more than 46% have the interest to join RDI projects. **This shows a big potential for new partnerships and the necessity to have support organisations which help to initiate and organise the matchmaking between offer and demand in the domain of new technologies and innovation for companies.**

### 3.3 Section 3 – Innovation management, new technologies and research knowledge

#### 3.3.1 Support services needed

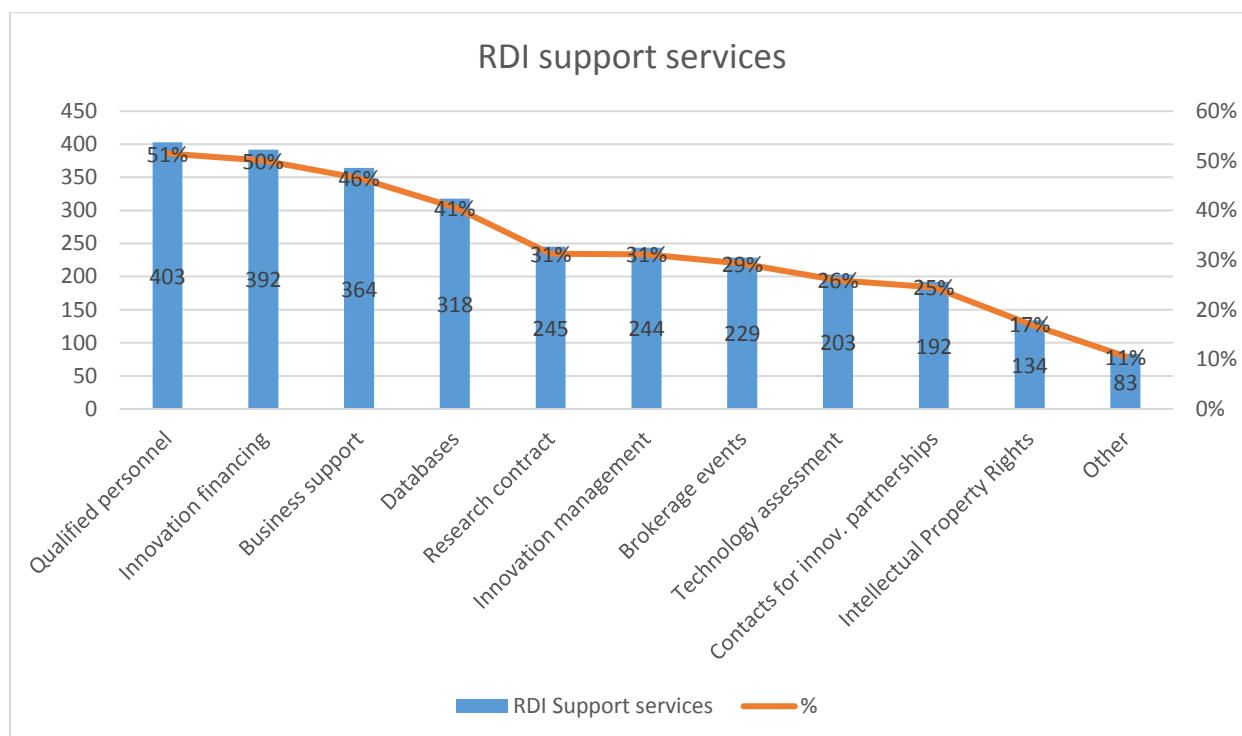


Figure 21 – RDI support services needed

The main support services needed from more than 40% of companies are in the domain of the recruitment of technology qualified personnel, innovation financing, business support and databases. Around 25%-30% of the companies are looking for support for research contract, innovation management, brokerage events, technology assessment and contacts for innovation partnership. Only 17% need support for IPR issues.

### 3.3.1.1 In relation to the size of the company

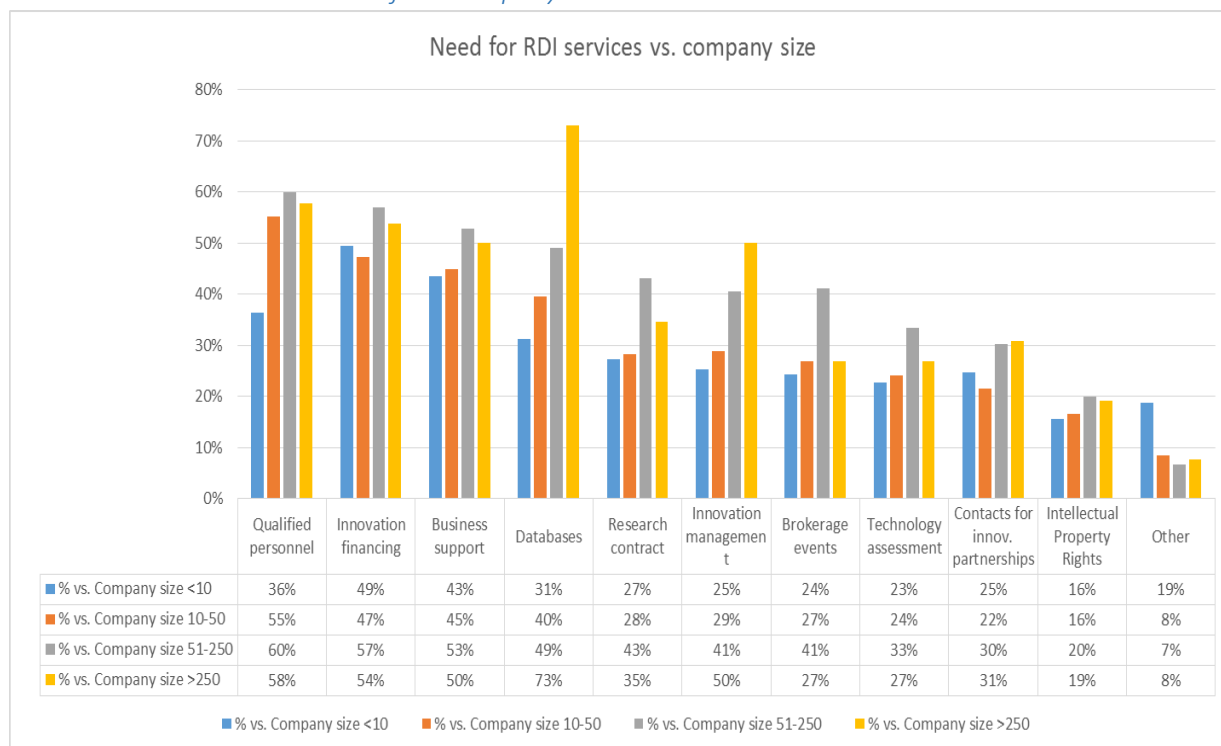


Figure 22 – Need for RDI services vs. company size

#### Services for qualified technological personnel

The demand is much higher (around 60%) for companies with more than 10 employees compared to micro-enterprises with < 10 employees (36%)

#### Services for innovation financing

The demand is similar for all categories of companies (around 50%).

#### Services for business support

The demand is similar for all categories of companies (around 45%-55%).

#### Services for databases

The demand for databases is much higher for companies with > 50 employees, especially for big companies (73%)

#### Services for research contract

The demand for research contract is especially high for middle size companies with 51-250 employees (43%) compared to the other categories.

#### Services for innovation management

The demand for innovation management is high (40%-50%) for companies with more than 50 employees.

### Services for brokerage events

The demand is high (40%-50%) for middle size companies with 51-250 employees (41%).

### Services for technology assessment

The demand is higher for middle size companies with 51-250 employees (33%) compared to the other categories.

For the other services, the demand is similar for all categories of companies (around 50%).

### Company size < 10 employees

More than 40% of companies needs services in the domain of Innovation Financing and Business Support.

#### 3.3.1.2 In relation to the RDI intensity

The following graph distinguish the needs between two types of companies:

1. Companies having a low RDI activity, due to the fact that they have less than 5% of the employees active in RDI activities (orange colour)
2. Companies having a high RDI activity (*RDI intensive*), corresponding to the fact than more than 5% of employees are active in RDI-related projects (blue colour)

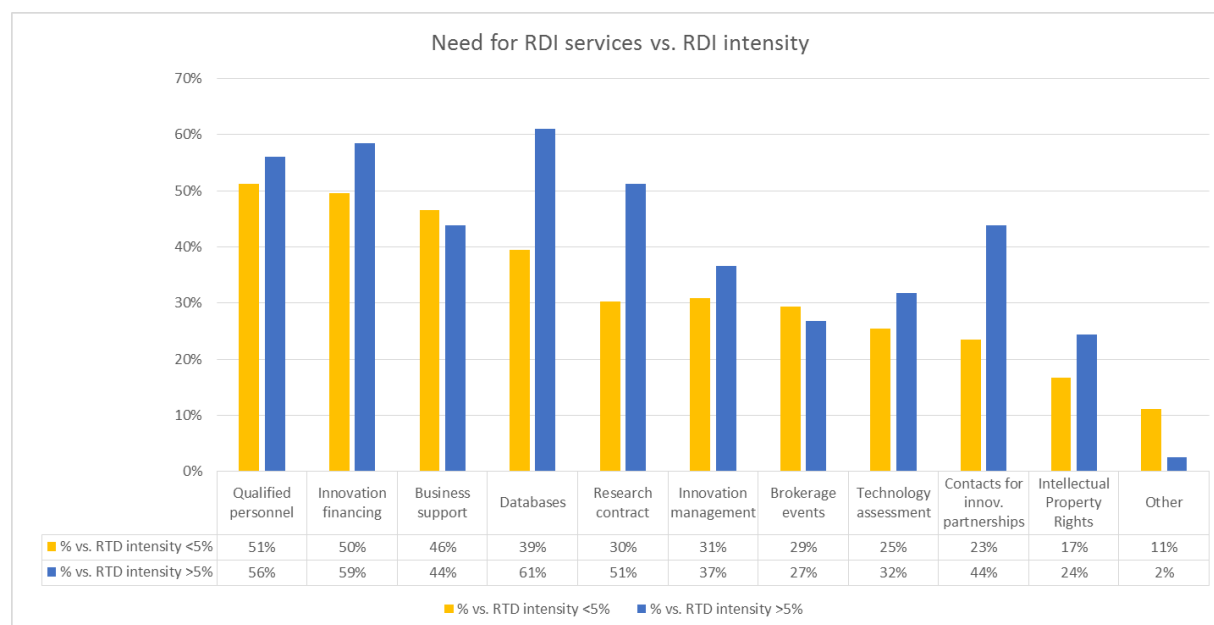


Figure 23 – Needs for RDI services vs. RDI intensity

The graph shows that the '*RDI intensive*' companies (with more than 5% employees involved in RDI activities) have a higher demand mainly in the following domains of:

- Databases (61% compared to 39%)
- Research contract (51% compared to 30%)
- Innovation financing (59% compared to 50%)
- Contact for innovation partnerships (44% compared to 23%)

### 3.3.1.3 In relation to the economic sector

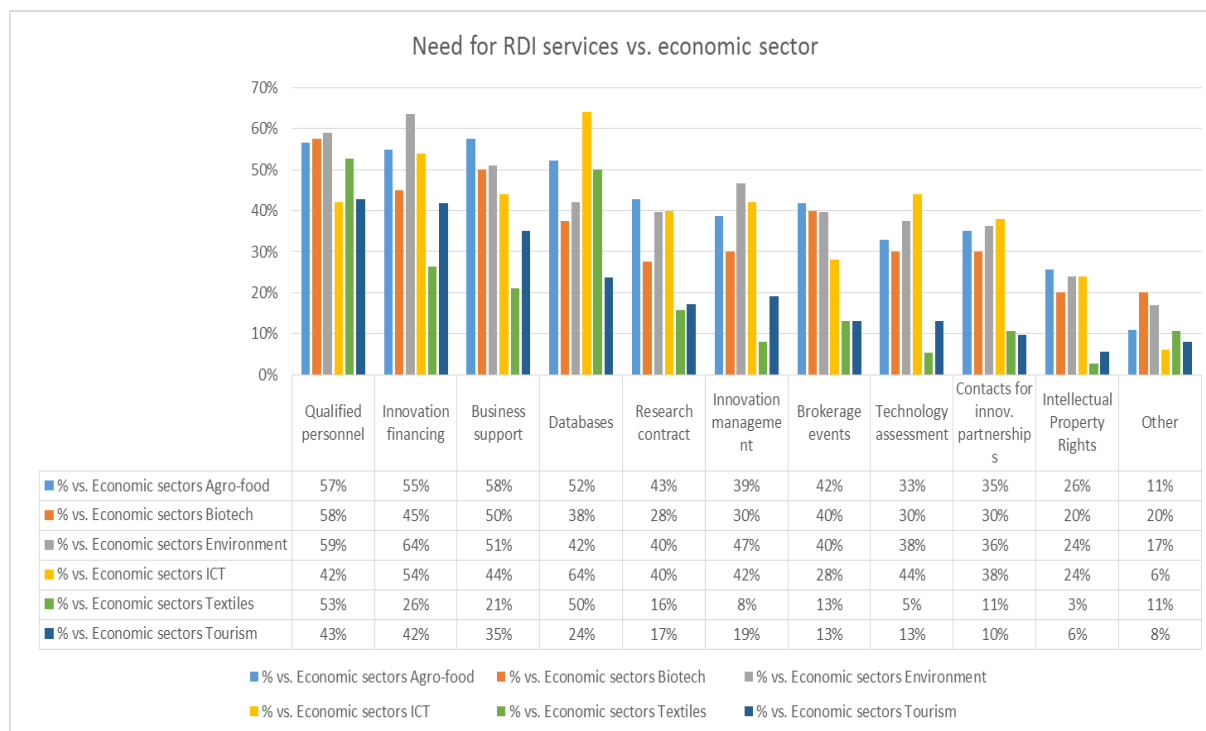


Figure 24 – Need for RDI services vs. economic sector

#### Services for qualified technological personnel

The demand is especially high in the sectors environment (59%), agro-food (57%) and Biotech (58%).

#### Services for innovation financing

The demand is especially high in the sectors environment (64%), agro-food (55%) and ICT (54%). In the domain of environment, no specific funding programme exists in Romania.

#### Services for business support

The demand is especially high in the sectors environment (51%), agro-food (58%) and Biotech (50%).

#### Services for databases

The demand is especially high in the sectors ICT (64%), agro-food (58%) and Textiles (50%).

#### Services for research contract

The demand is especially high in the sectors environment (47%), agro-food (39%) and ICT (42%).

#### Services for innovation management

The demand is especially high in the sectors environment (43%), agro-food (40%) and ICT (40%).

#### Services for brokerage events

The demand is especially high in the sectors environment (40%), agro-food (42%) and Biotech (40%).



## Services for technology assessment

The demand is especially high in the sectors ICT (44%) and environment (38%).

### 3.3.2 Frequency of use of RDI services per year in the future

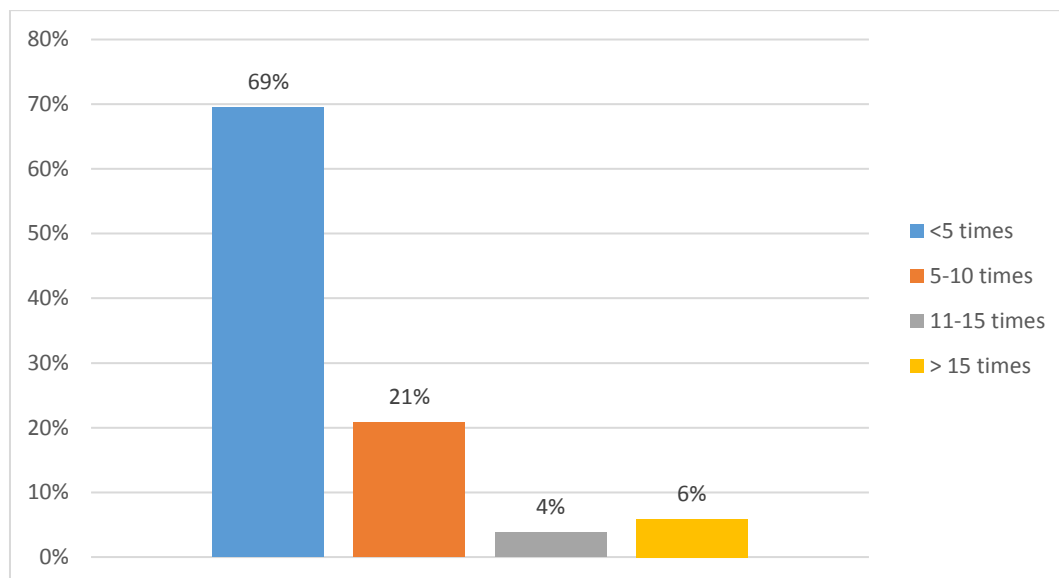


Figure 25 – Frequency of use of RDI services per year

More than 30% of the companies will use RDI services more than 5 times per year. They represent around 250 companies in the NE region and are the target group for RDI services.

### Frequency of use in relation to the company size

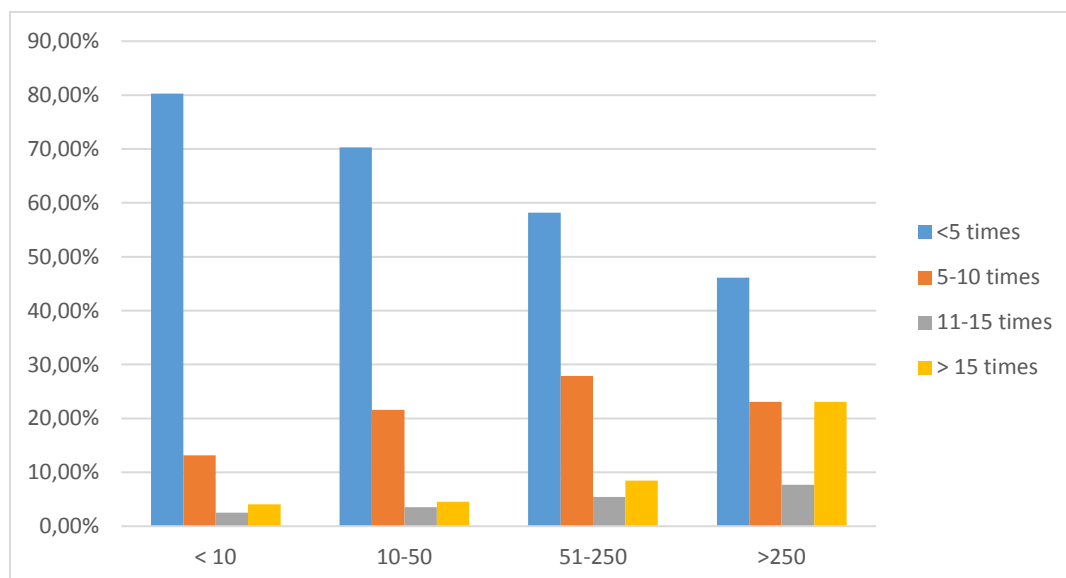


Figure 26– Frequency of use of RDI services vs. company size

The frequency of use of RDI services is increasing in average with the size of the company. Bigger companies are more aware of the importance to collaborate with RDI organisations.

### 3.3.3 Long term vision of innovation

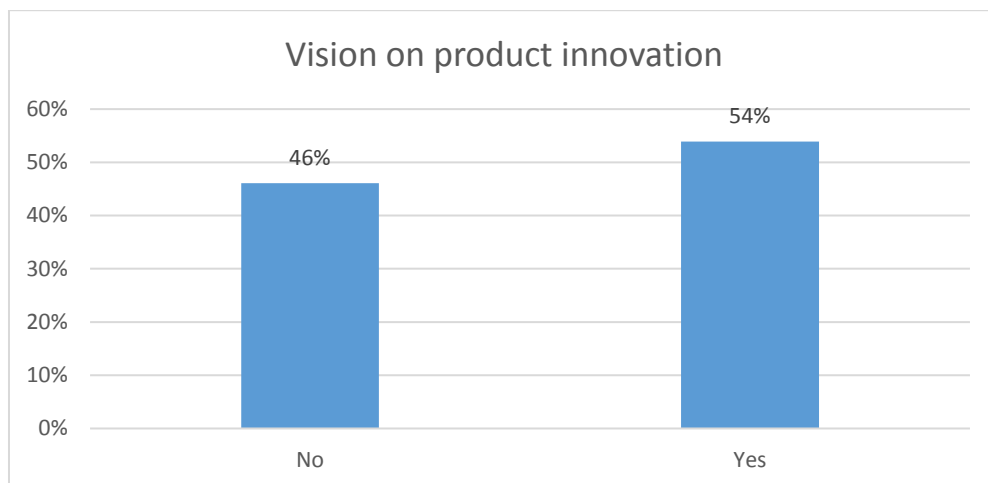


Figure 27 – Vision on product innovation

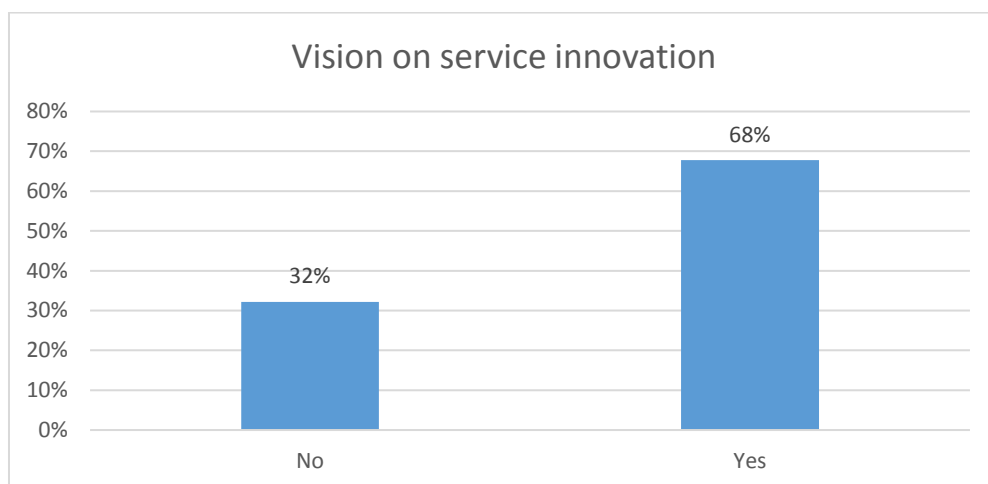


Figure 28 – Vision on service innovation

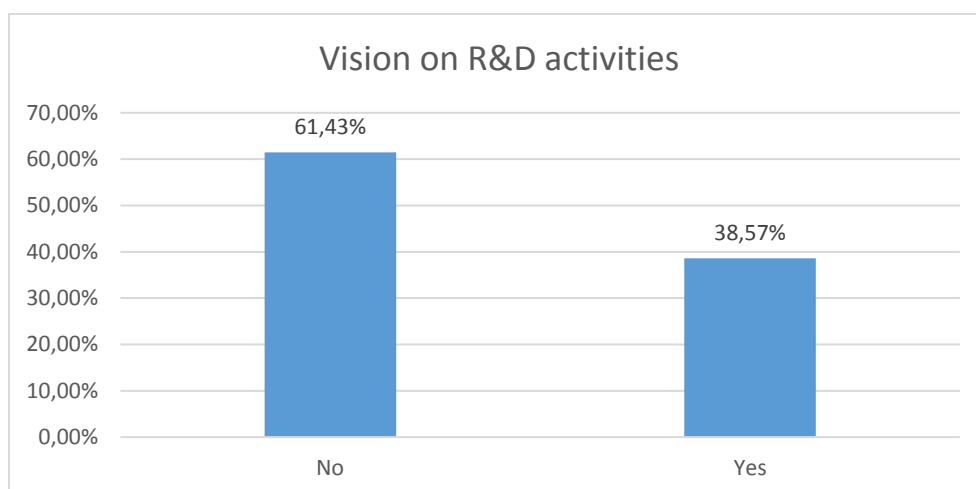


Figure 29 – Vision on R&D innovation

The vision concerning **service innovation** is strongly present compared to product innovation or R&D activities. Nearly 68% of the companies declare to have a long term vision for innovative services.

This shows a specific demand for a support in the domain of service innovation in the NE region e.g. in the domain of tourism.

### 3.3.3.1 In relation to company size

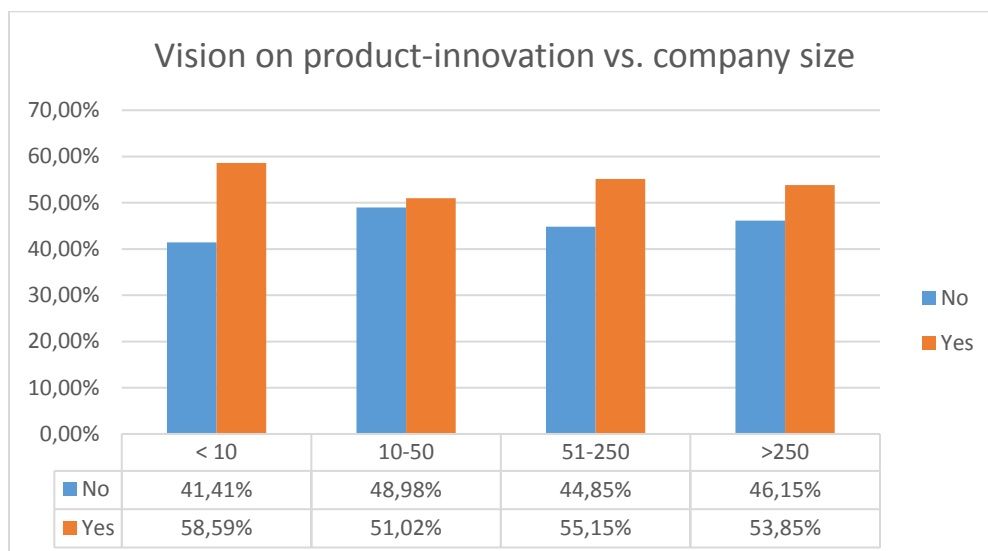


Figure 30 – Vision on product-innovation vs. company size

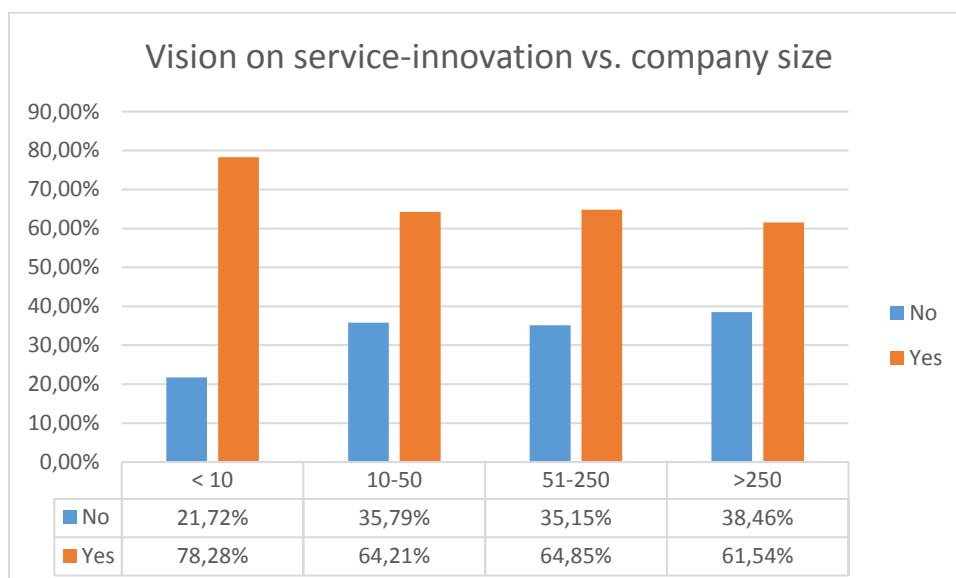


Figure 31 – Vision on service-innovation vs. company size

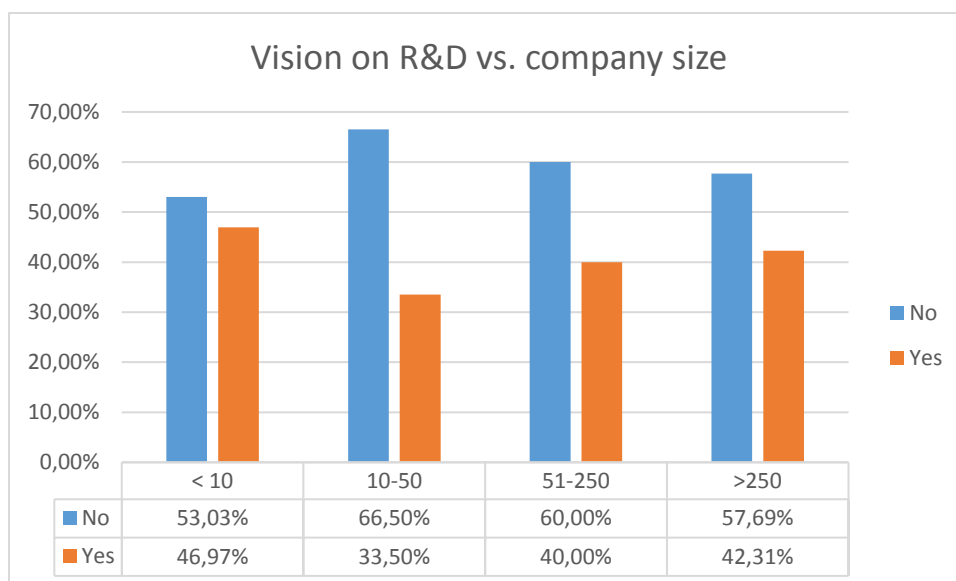


Figure 32 – Vision on R&D activities vs. company size

More micro-enterprises (<10 employees) have a vision concerning innovation in all 3 categories of product innovation, service innovation and R&D activities, compared to bigger enterprises. For this reason specific support should be propose for micro-enterprises e.g. through consultancy and brokerage events. Especially in the domain of service innovation, nearly 80% of the micro-enterprises have a vision at long-term. This shows a strong awareness of the enterprises for the importance of innovation, which is success factor for starting TT&I services in this domain.

### 3.3.3.2 In relation to the economic sectors

#### Product innovation

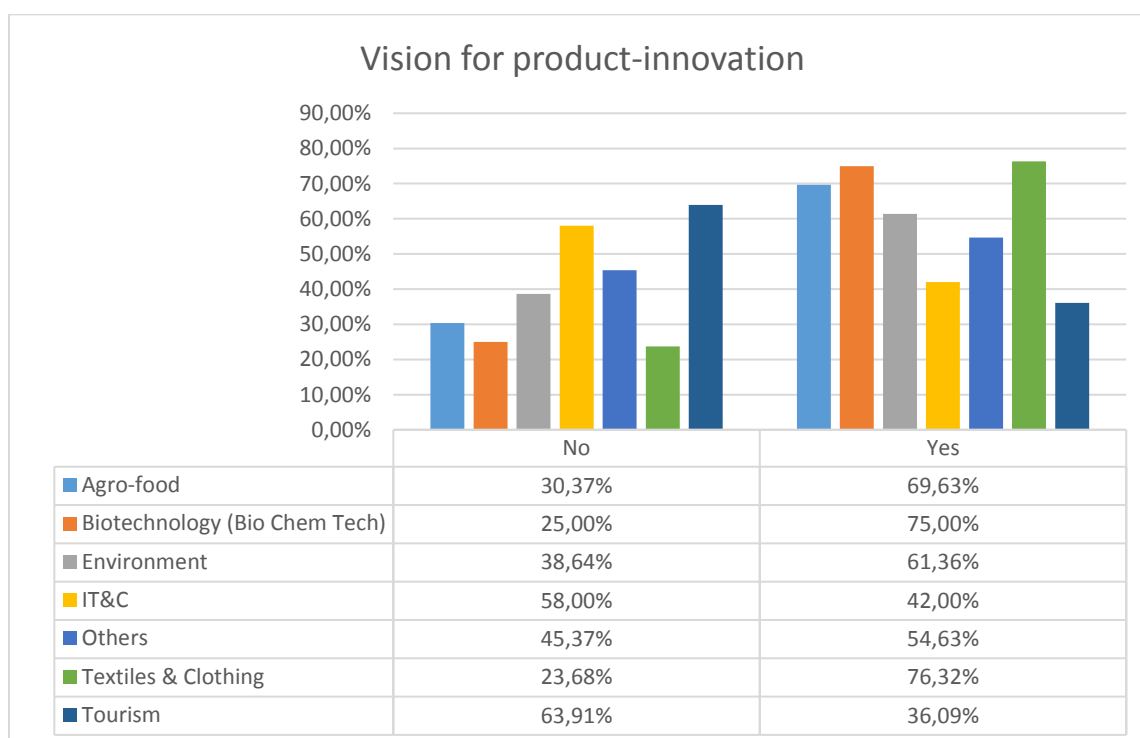


Figure 33 – Vision for product-innovation in the different economic sectors

The vision for product innovation is especially strong in the sectors of agro-food, biotech and textiles & clothing.

#### Service innovation

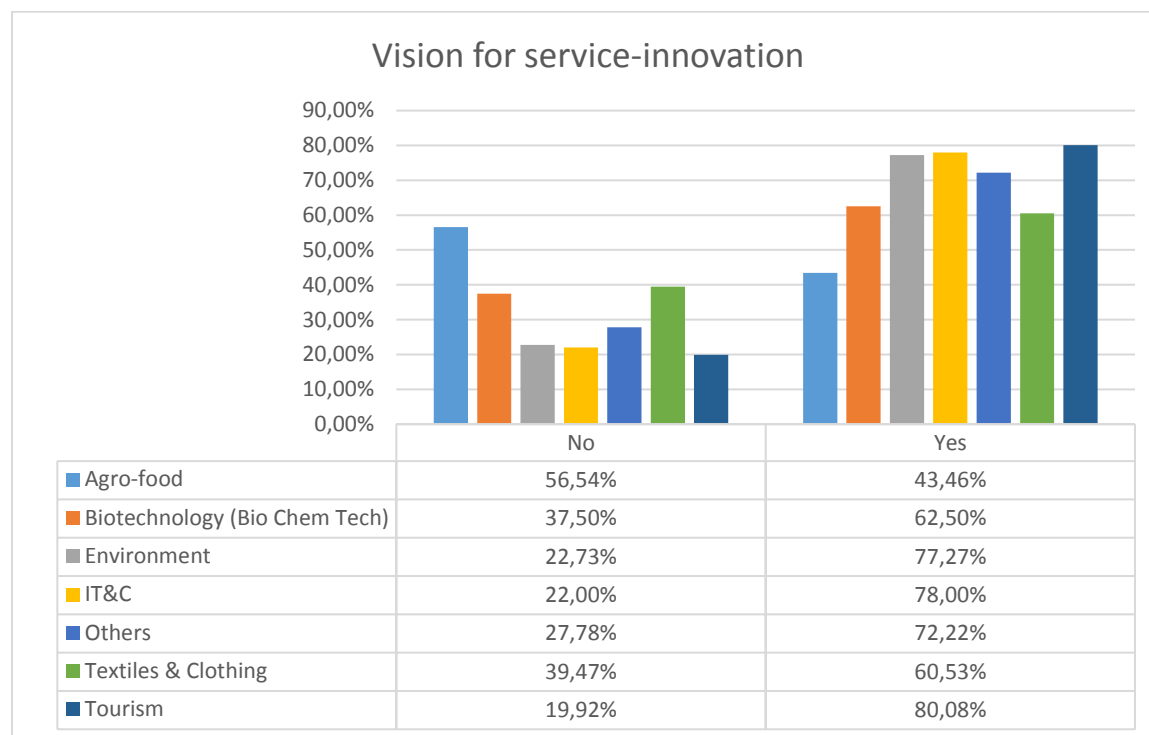


Figure 34 – Vision for service innovation in the different economic sectors

The vision for service innovation is especially strong in the sectors of tourism, IT&C and environment.

#### Vision on R&D activities

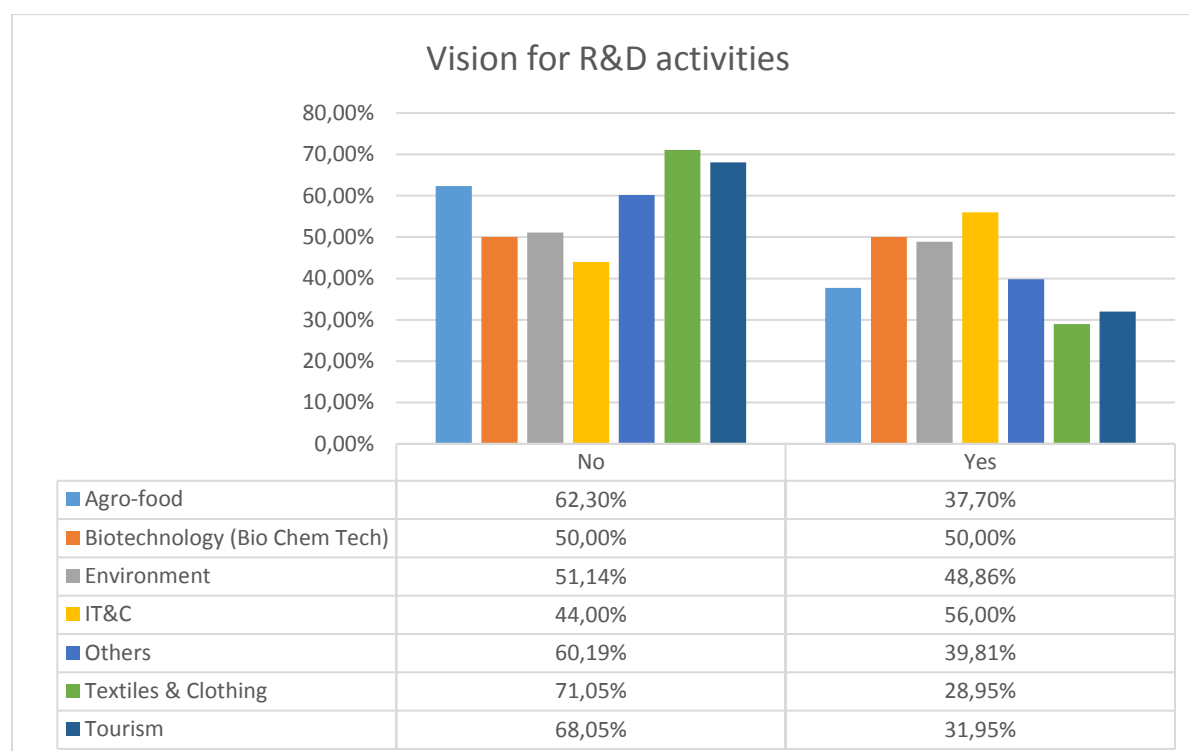


Figure 35 - Vision for service innovation in the different economic sectors

Around 40% of the companies have a long term vision on R&D activities, which is less than the two other domains, but still shows a strong potential corresponding to approx. **300 enterprises**. This especially the case in the sectors IT&C (56%), Biotech (50%) and Environment (49%).

These sectors are especially interesting to develop an offer for R&D services at long term in the region.

### 3.3.4 Financial budget for innovation measures

It is very important for companies to have a dedicated budget for innovative activities. It is an investment for the future. This shows their awareness to develop or not innovative products or services in order to ensure the future of the company.

Around 40% of the companies have a specific internal budget for innovation measures.

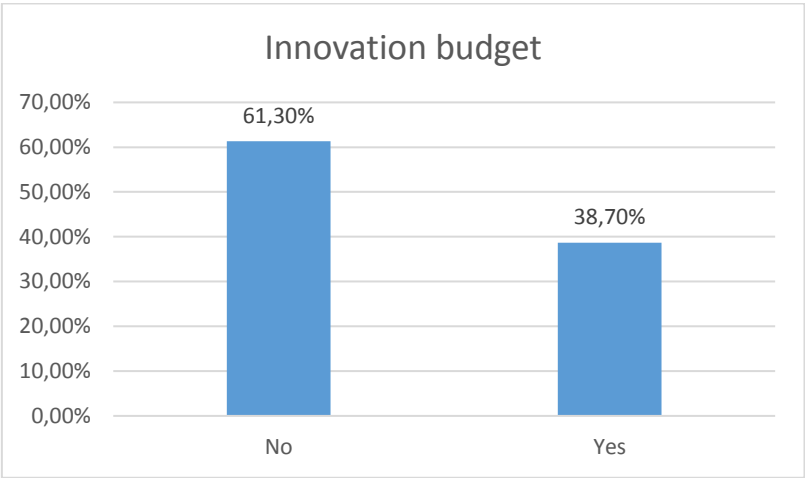


Figure 36 – Percentage of companies having an internal budget for innovation

#### 3.3.4.1 In relation to company size

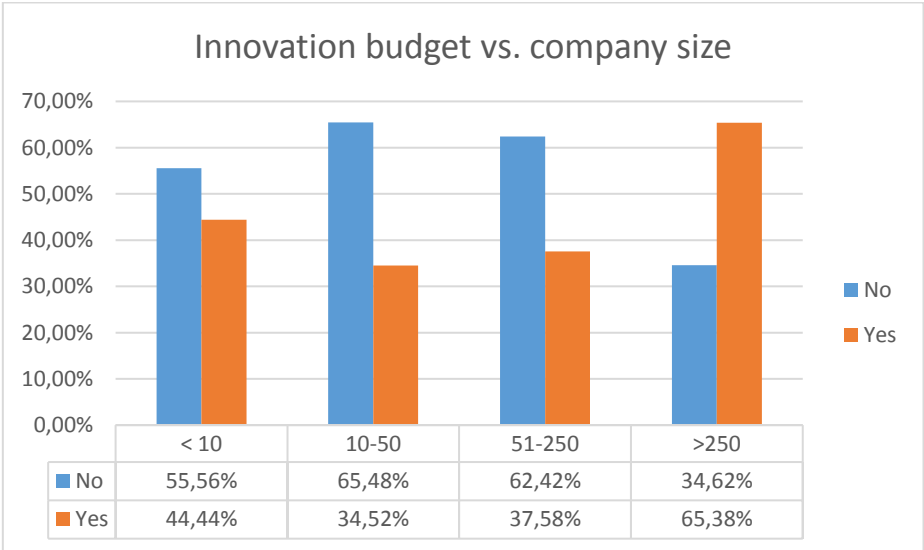


Figure 37 – Innovation budget vs. company size

The percentage is lower for companies having 10-250 employees. In conclusion there is a need to identify solutions to share the financial risk for these companies through e.g. public funded projects in medium sized companies, because only around 1/3 have an internal innovation budget.

### 3.3.4.2 In relation to economic sector

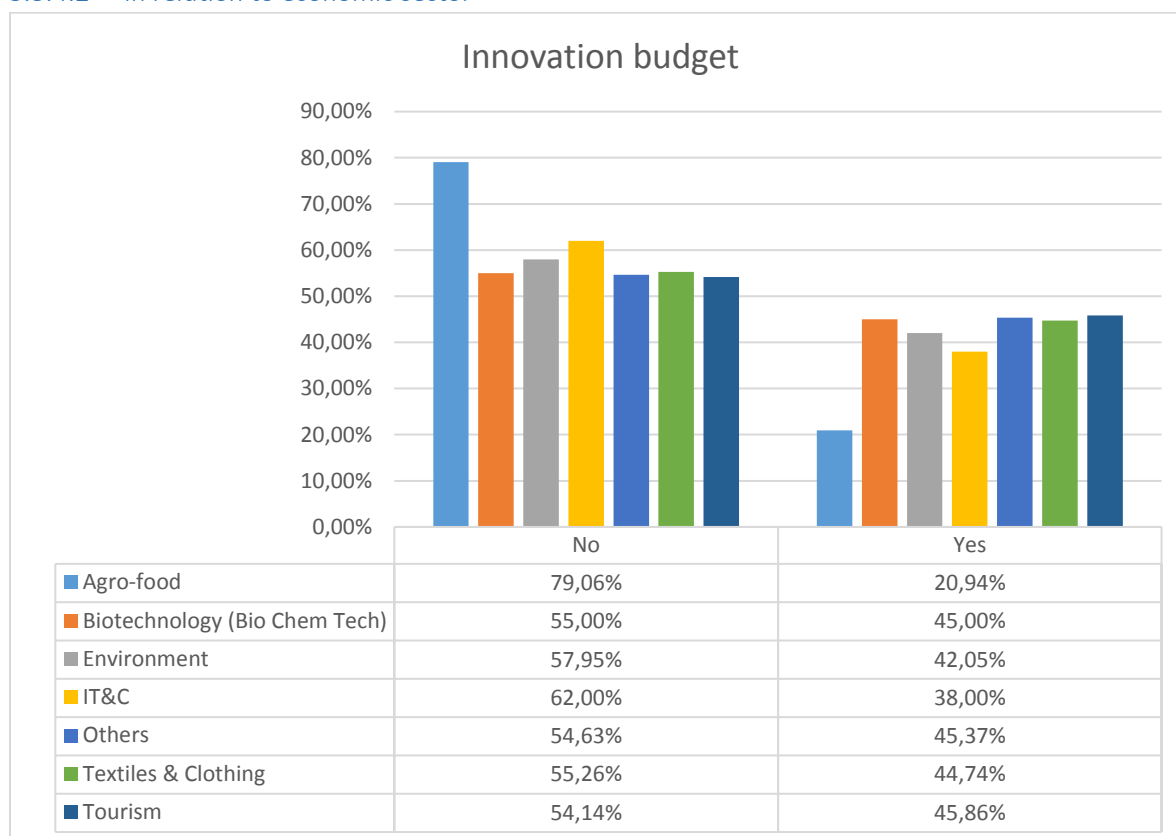


Figure 38 – Percentage of companies having their own innovation budget vs. economic sectors

Around 40% of the enterprises have a budget dedicated to innovation. The percentage is especially low in the agro-food sector with only 20% compared to the other sectors.

In the agro-food sector, the actors are mainly technology users. They are not enough aware of the growth potential for their companies to transform raw materials into added value products. A specific focus on RDI demand in the agro-food sector should be developed.

### 3.3.5 Contribution of employees concerning innovation

For the generation of innovative ideas for new products or services in a company, the employees can play an essential role if a process with specific measures to encourage and to gather these ideas is in place.

At the question “Does the contribution of the employees play a primary role concerning innovation?”, 60% of the companies answered positively.

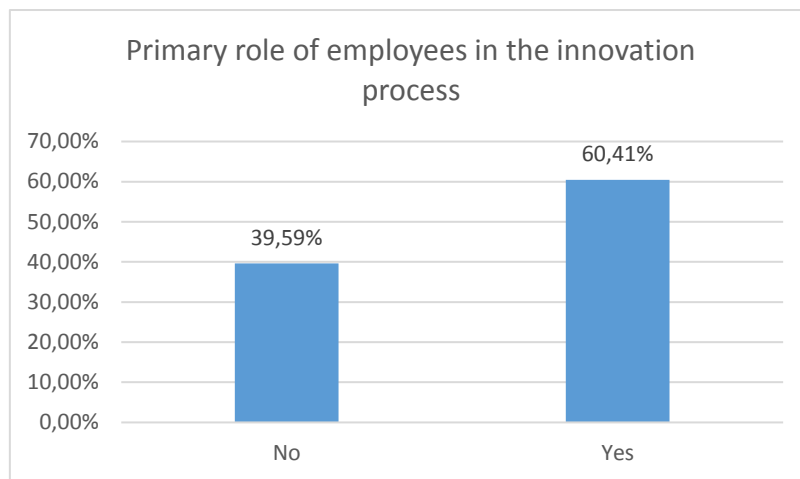


Figure 39 – Primary role of employees in the innovation process

### 3.3.5.1 In relation to company size

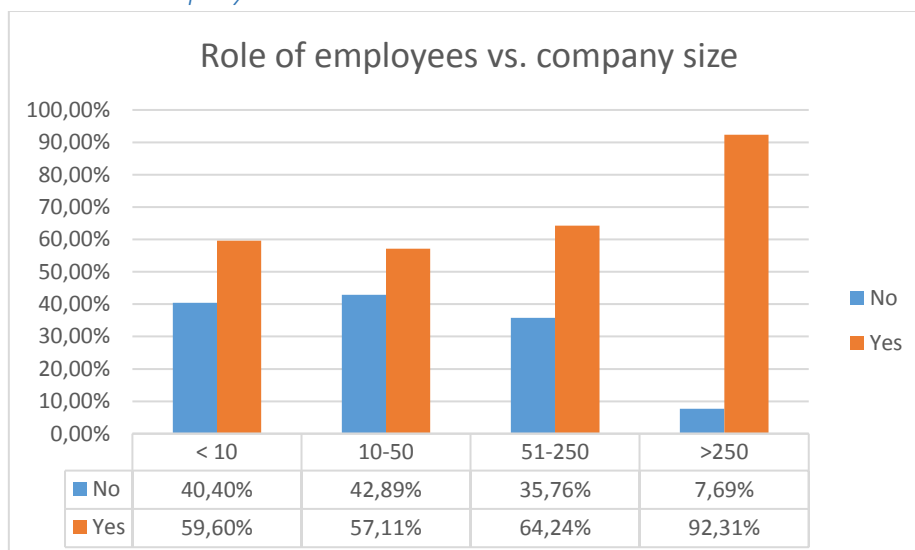


Figure 40 – Role of employees vs. company size

The primary role of employees concerning innovation measures in the company is increasing with the size of the company. In conclusion the generation of new ideas and projects in companies with less than 250 employees should be reinforced by e.g. innovation workshops.



### 3.3.5.2 In relation to economic sector

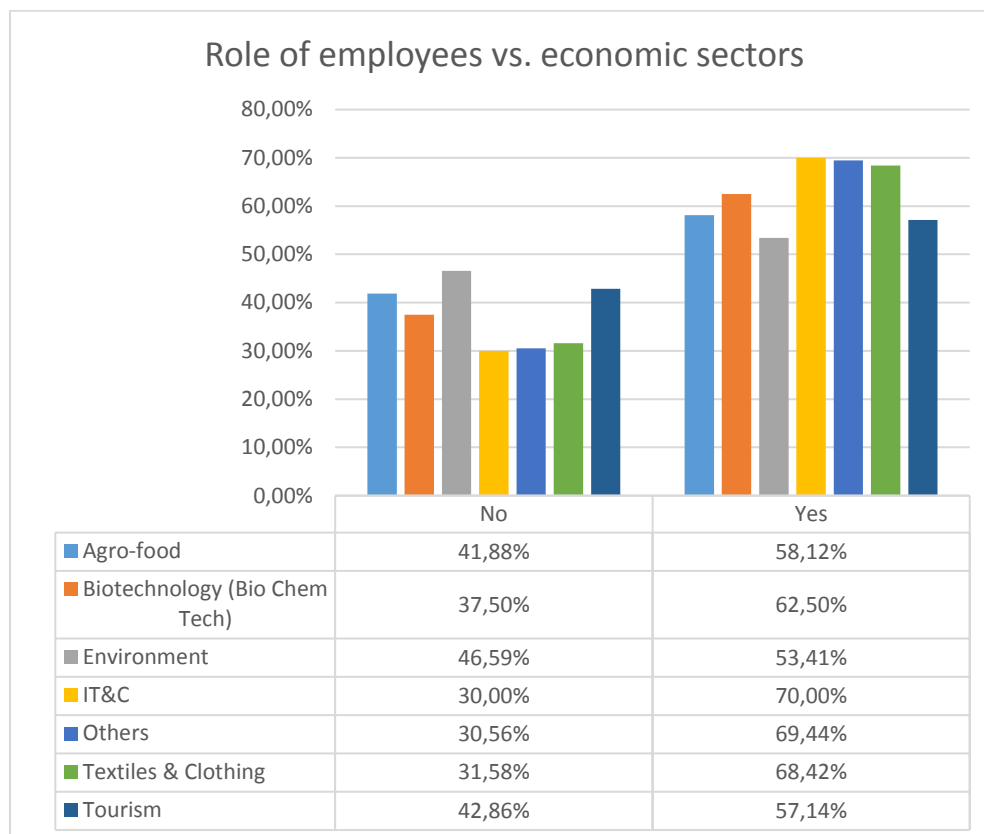


Figure 41 - Role of employees vs. economic sectors

The role of employees in the innovation process is especially recognised in the sectors IT&C and Textiles, but not in environment, which is a sector with special needs to conform with specific regulations involving technological changes, as well as in tourism and agro-food (in which a very low technology level is present). A change of mentality and support for specific technological/innovation competences is necessary.

### 3.3.6 Systematic method for innovation

For innovative companies it is essential to have a systematic approach concerning innovation e.g. to have regular technology watch and technology scouting activities in order to be aware of the latest state of the art in their domain of activity. Also innovation management techniques can strongly help to develop an innovation culture in companies and transform innovative ideas into successful commercial products.

To the question “Do you have a systematic method to source and invent continuously new technologies for your future needs?”, only 20% of the companies have answered with “yes” (Figure 42). This low percentage shows a strong demand for innovation management techniques.

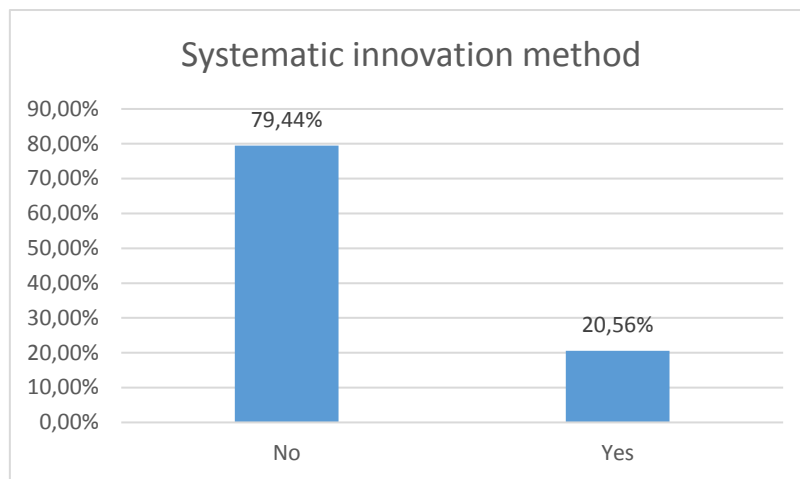


Figure 42 – Percentage of companies having systematic innovation method

### 3.3.6.1 In relation to company size

The lowest percentage of companies having systematic innovation method is for companies having 10-50 and 51-250 employees.

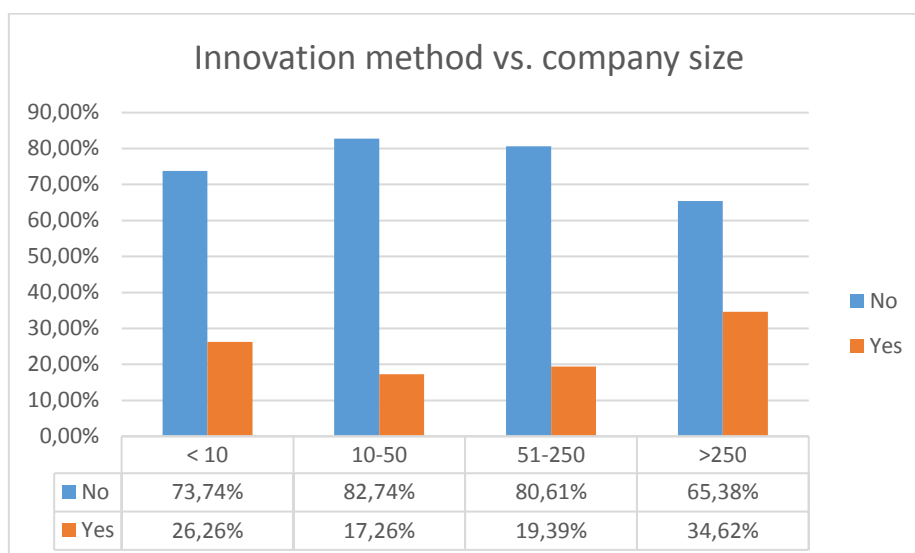


Figure 43 - Percentage of companies having systematic innovation method vs. company size

### 3.3.6.2 In relation to economic sector

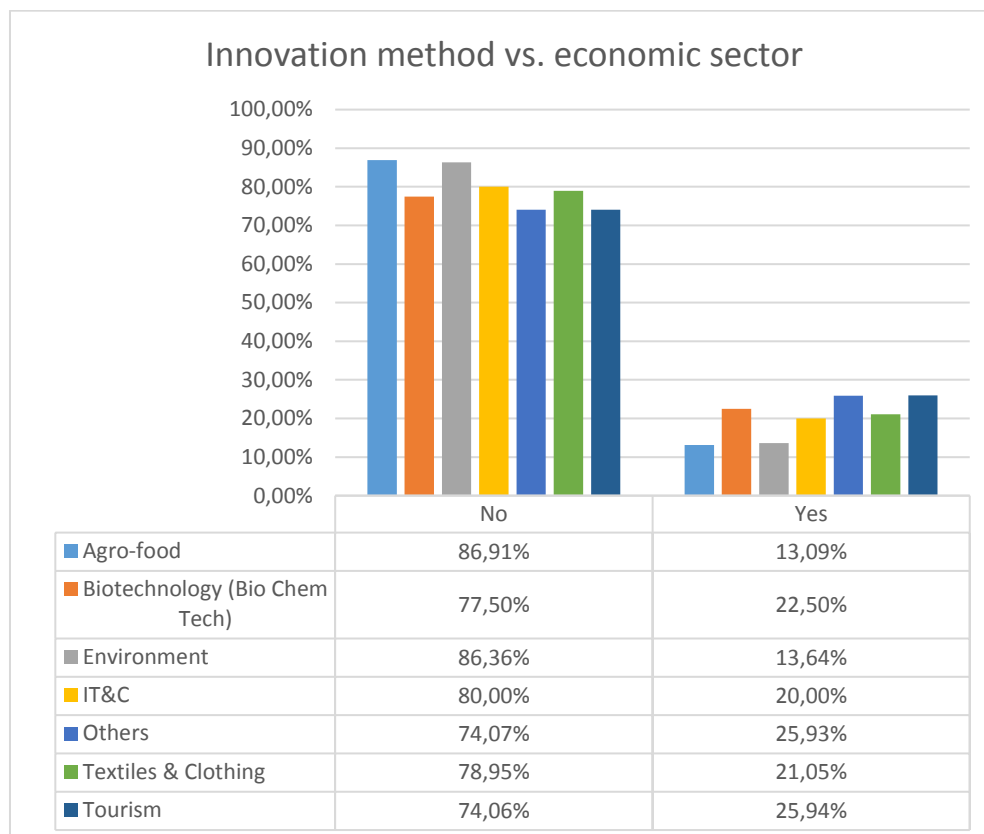


Figure 44 - Percentage of companies having systematic innovation method vs. economic sector

Only 20% of the companies have a systematic approach to make technology watch and technology scouting. This deficit is especially strong in the sectors of agro-food and environment and in medium sized companies with 10-250 employees.

### 3.3.7 Information sources concerning innovation and R&D activities

Concerning innovation and R&D activities, a company can have different types of sources of information:

1. Internal sources: own employees and specific working groups from different departments
2. Market-mediated sources: competitors, customers, consulting firms or suppliers
3. Research-mediated sources: universities, public or non-profit research institutes
4. Other external sources: patents, conferences, scientific and commercial publications, databases, trade fairs, exhibitions

To the question “Which source(s) of information concerning innovation do you consider?” the companies have given the following answers (Figure 45 - Figure 48):

### 3.3.7.1 Internal sources

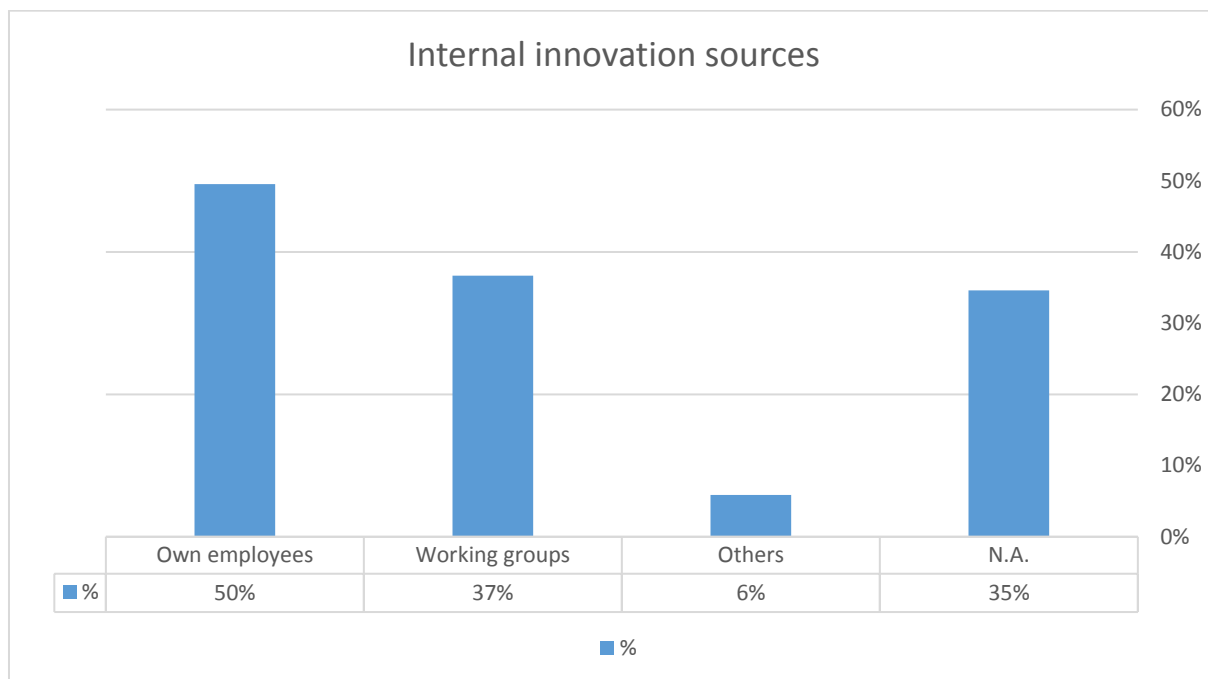


Figure 45 – Internal innovation sources

### 3.3.7.2 Market-mediated sources

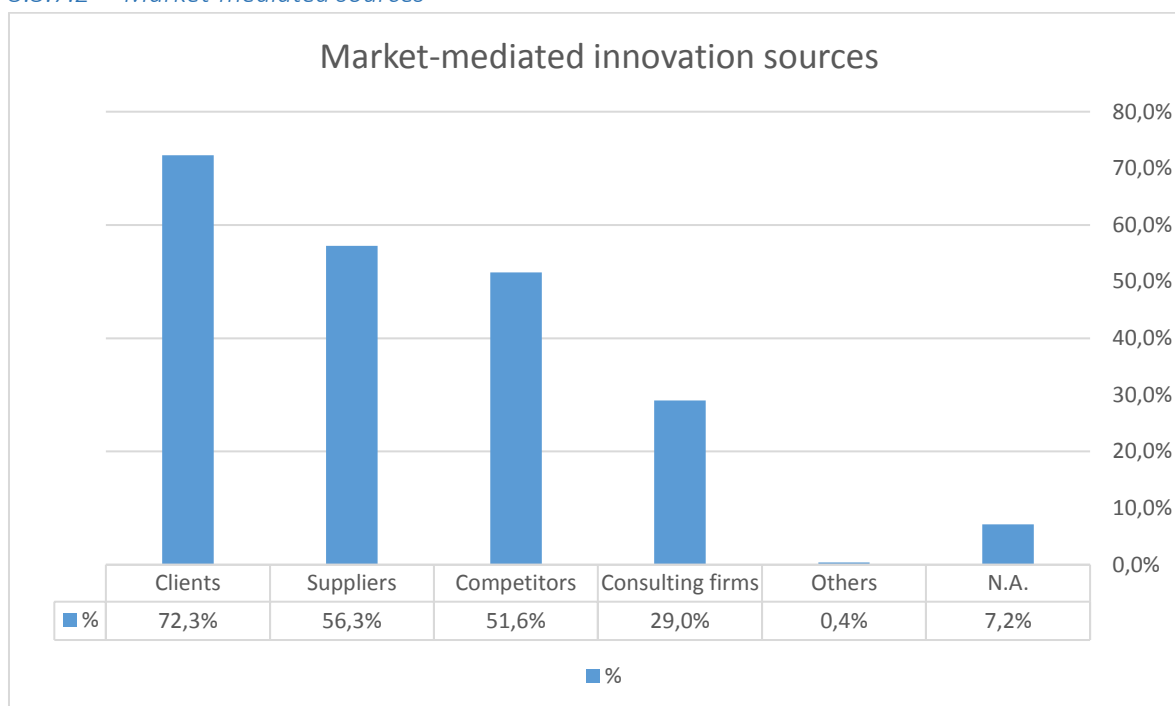


Figure 46 – Market-mediated innovation sources

### 3.3.7.3 Research-mediated sources

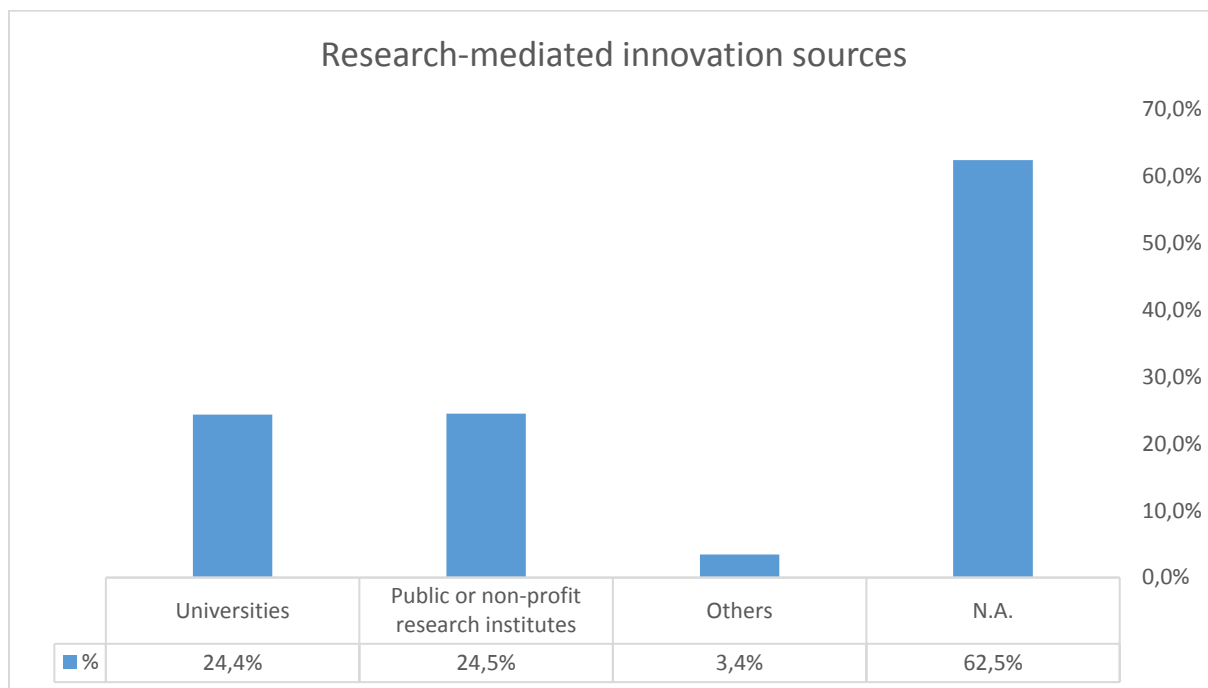


Figure 47 – Research-mediated innovation sources

### 3.3.7.4 Other external innovation sources

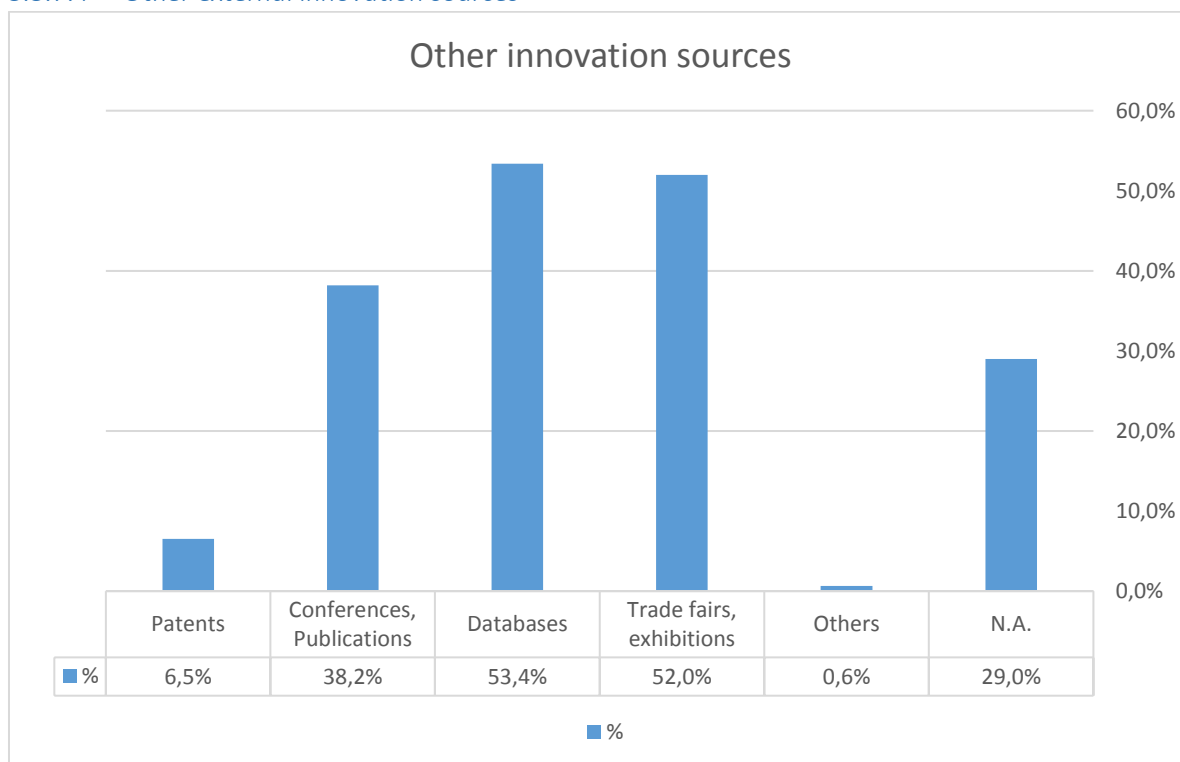


Figure 48 – Other external innovation sources

### 3.3.8 Use of new technologies/R&D knowledge for new products/services development

For the purpose of this survey, new technologies are considered to be not older than 5 years.

Around 50% of the companies are using new technologies or R&D knowledge in their products or services (Figure 49).

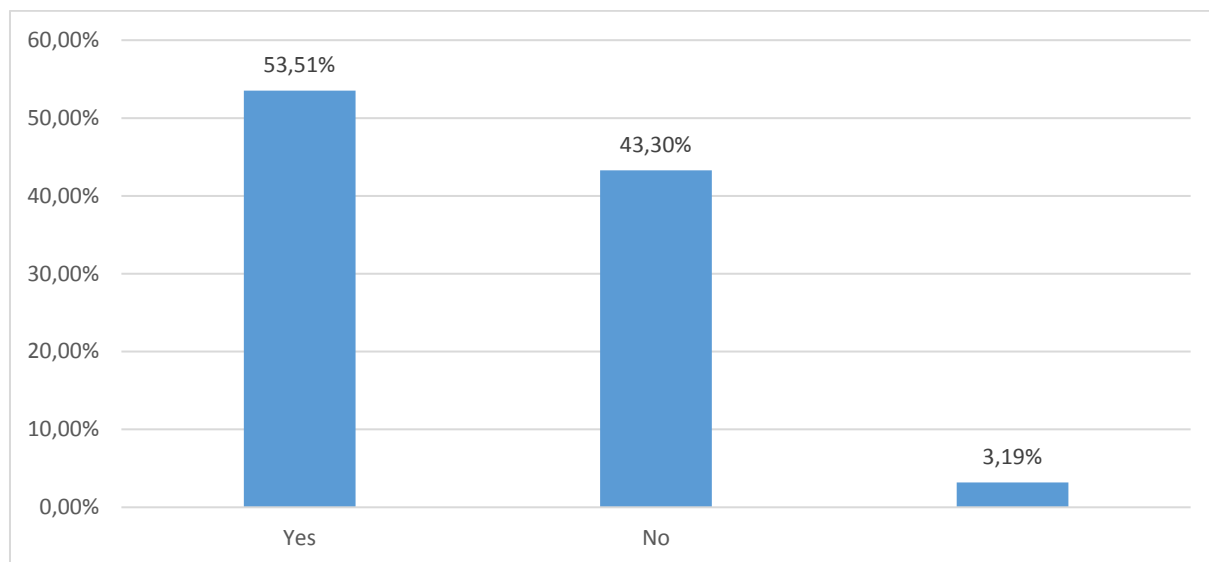


Figure 49 – Percentage of companies using new technologies or R&D knowledge in their products/services

#### Use of new technologies or R&D knowledge in relation to company size

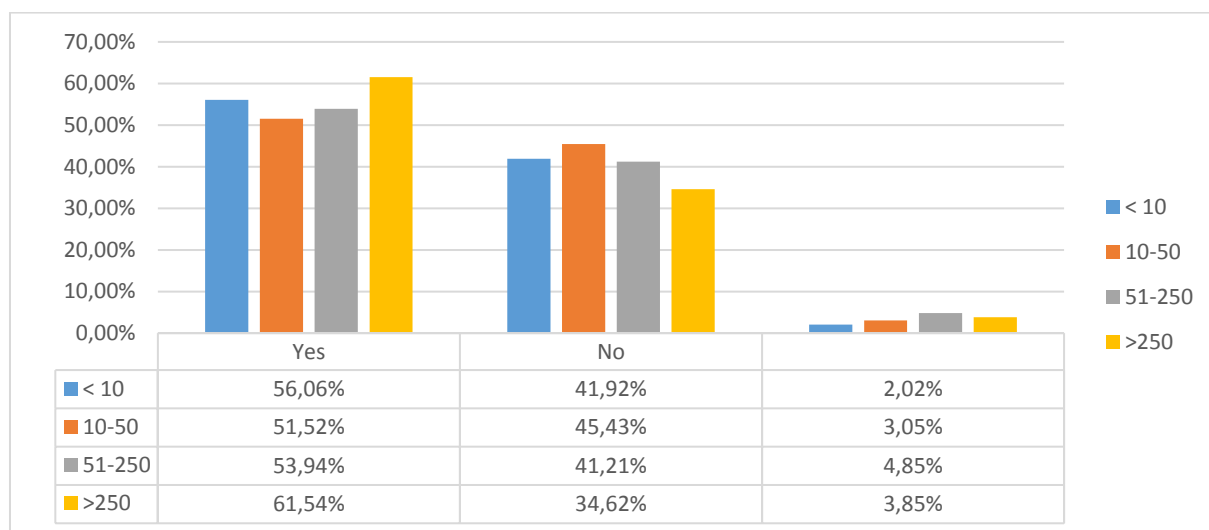


Figure 50 - Use of new technologies or R&D knowledge vs. company size

## In relation to economic sector

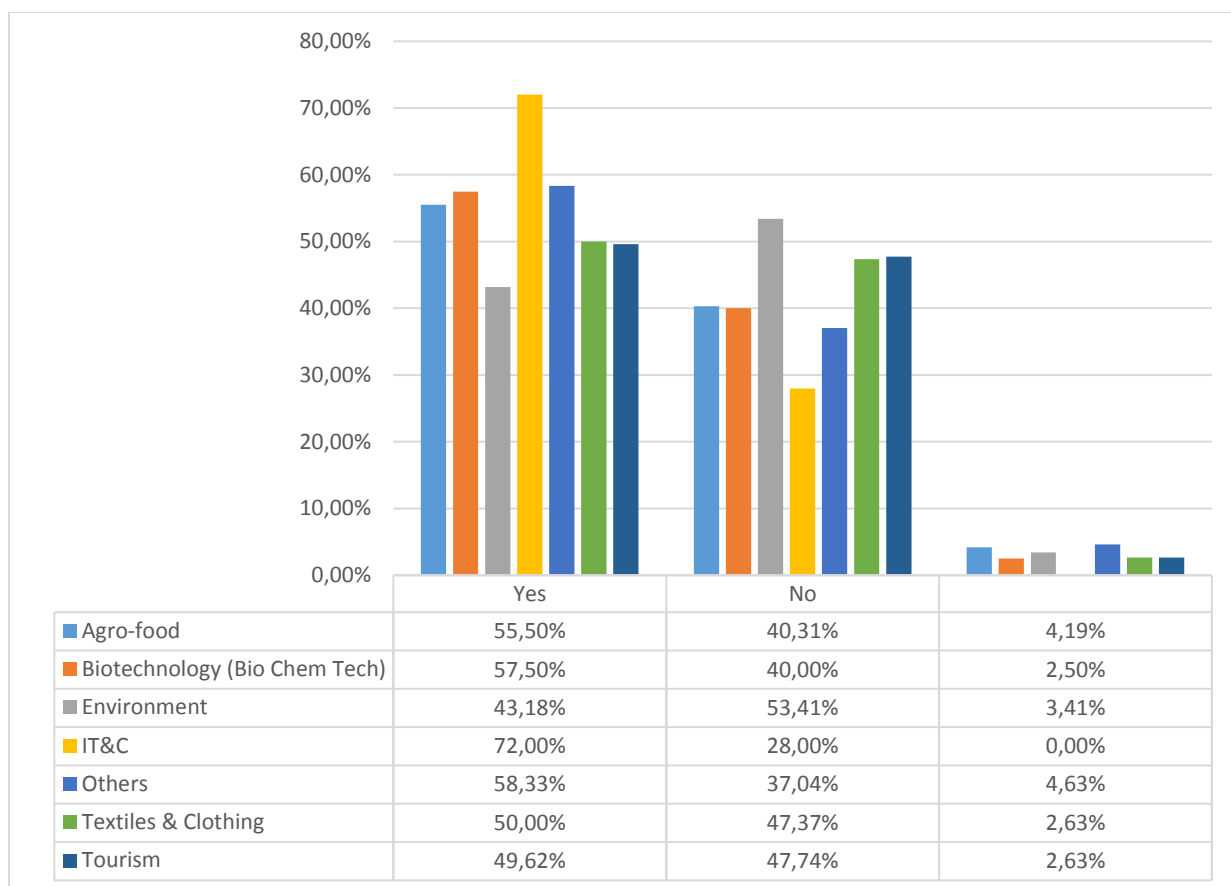


Figure 51 - Use of new technologies or R&D knowledge in relation to economic sectors

### 3.3.8.1 Main drivers to use new technologies and R&D knowledge

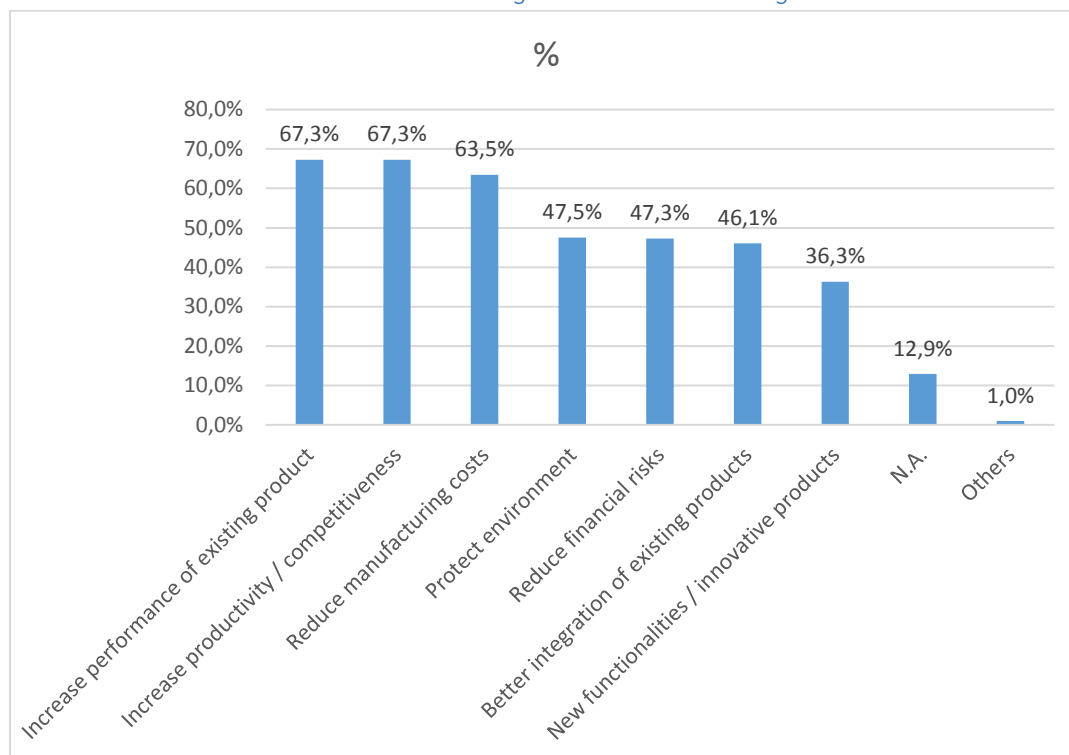


Figure 52 – Main drivers to use new technologies and R&D knowledge

The main drivers to use new technologies or R&D knowledge for new products or services are similar to the objectives stated in §3.2.1, namely:

- Increase performance of existing products / services (67%)
- Increase productivity and competitiveness (67%)
- Reduce manufacturing costs (63%)

To '**reduce the manufacturing costs**' is especially strong in the sector of biotech and environment. In the Textiles & Clothing sector to '**increase the performances of existing products**' is especially strong.



## Main drivers in relation to company size

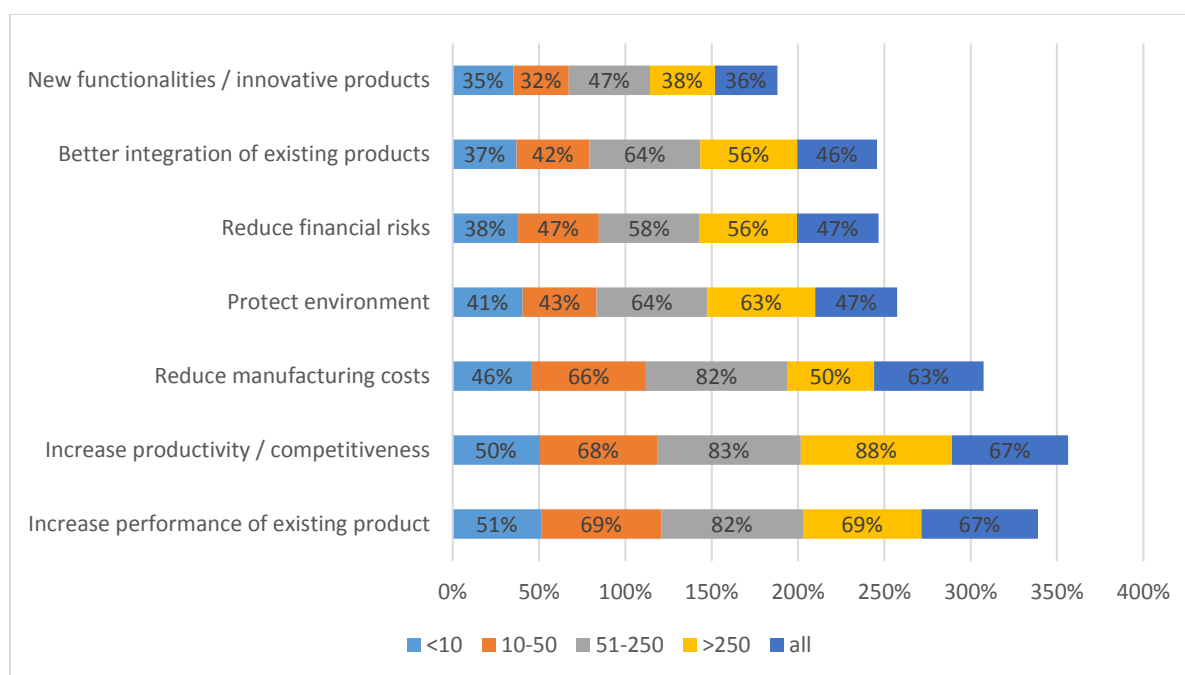


Figure 53 – Main drivers vs. company size

## Main drivers in relation to economic sectors

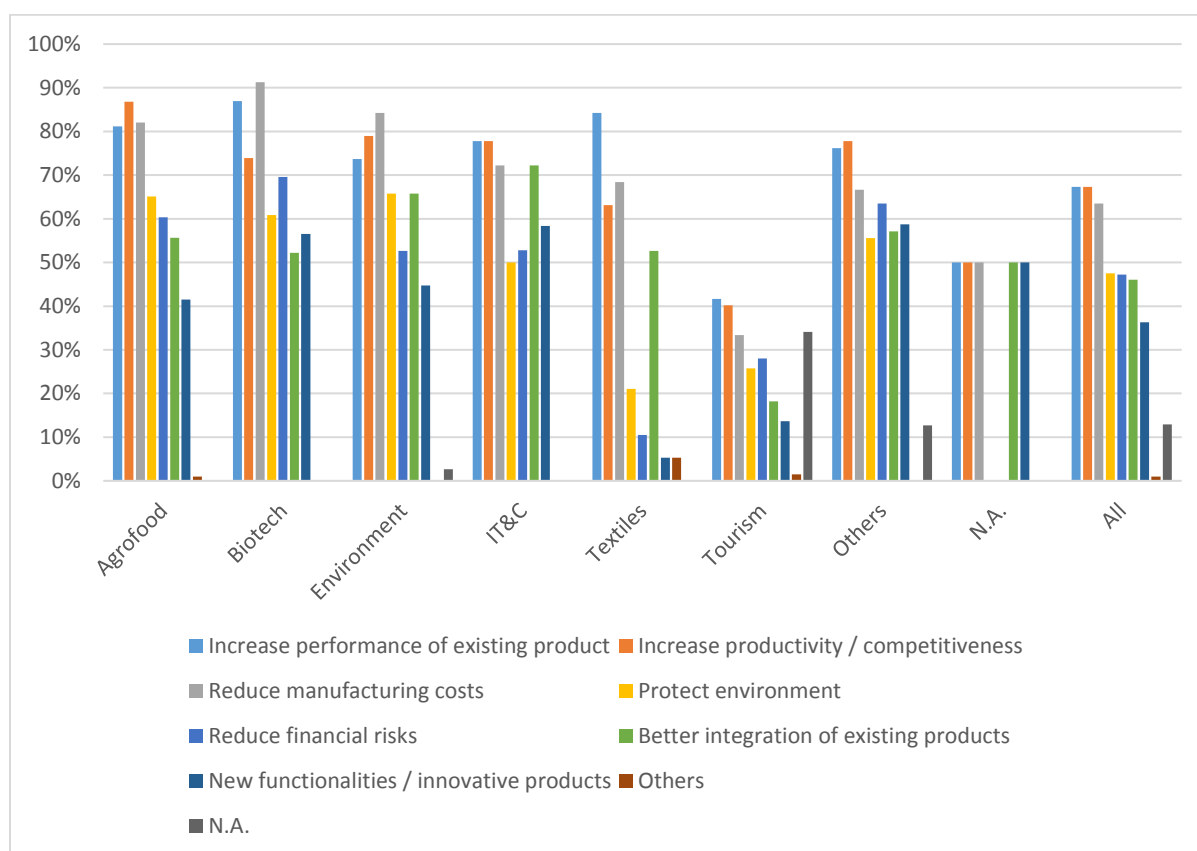


Figure 54 – Main drivers vs. economic sectors

### 3.3.8.2 Main barriers to use new technologies and R&D knowledge

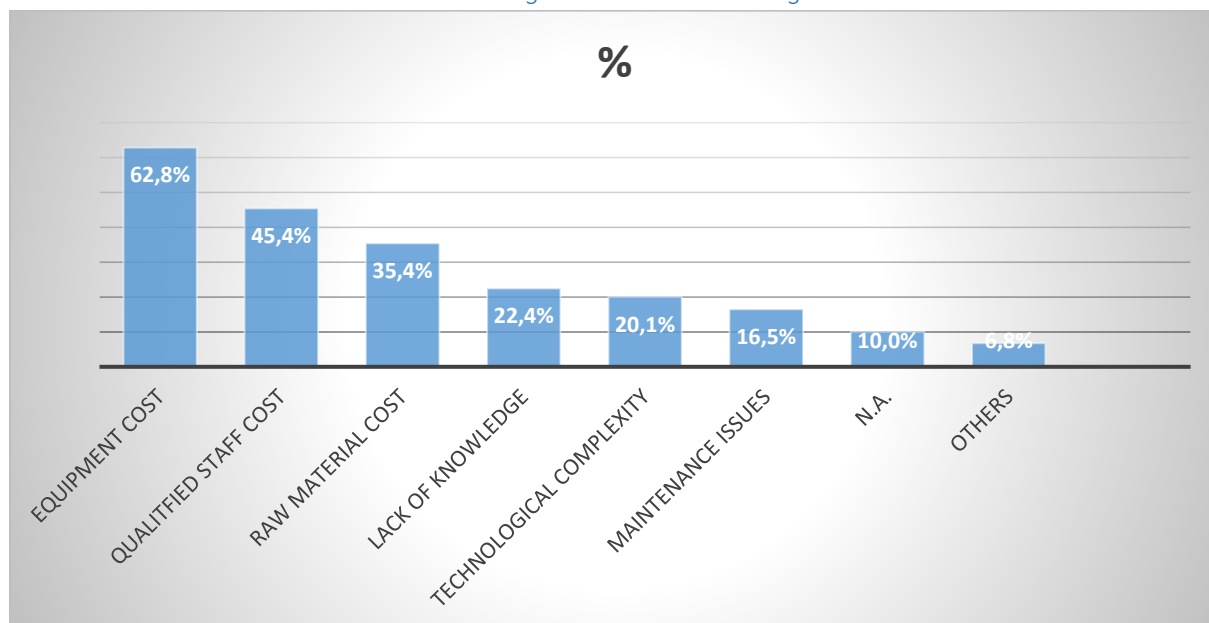


Figure 55 – Main barriers to use new technologies and R&D knowledge

### Main barriers in relation to company size

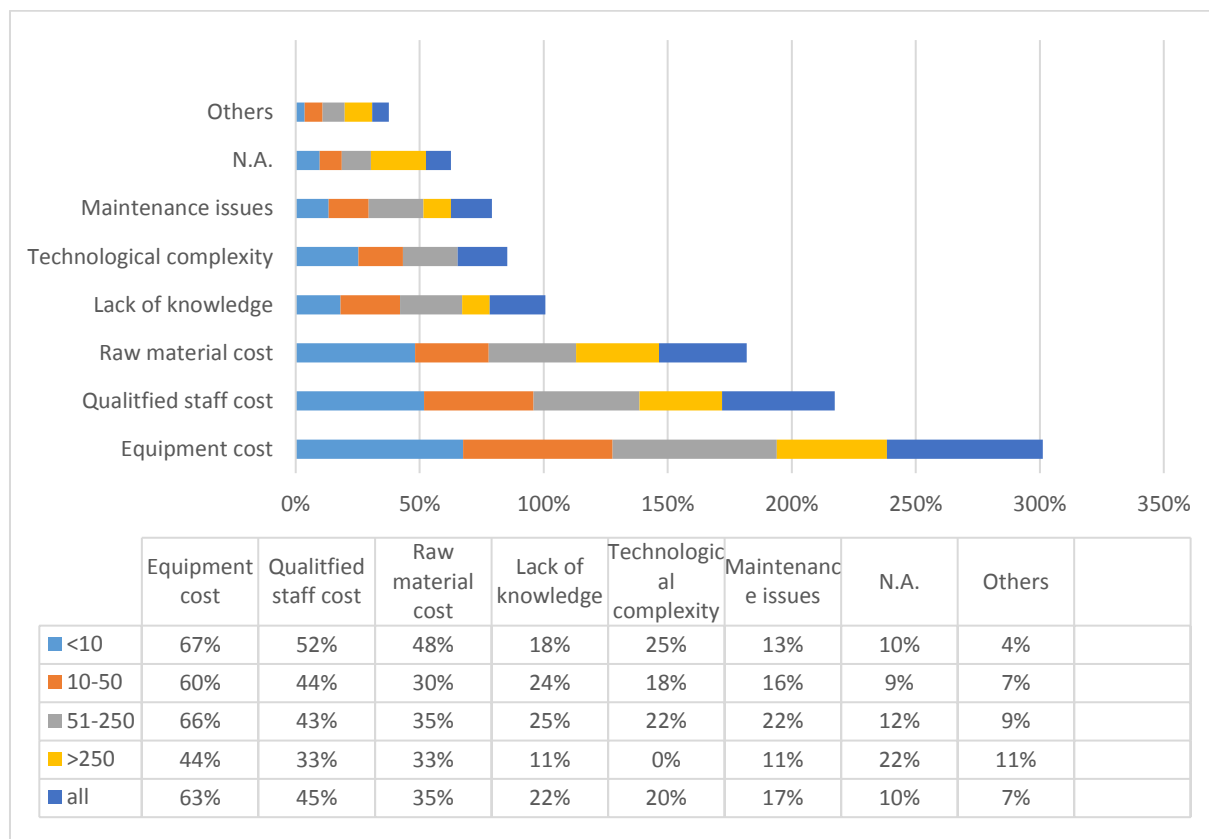


Figure 56 – Main barriers vs. company size

## Main barriers in relation to economic sectors

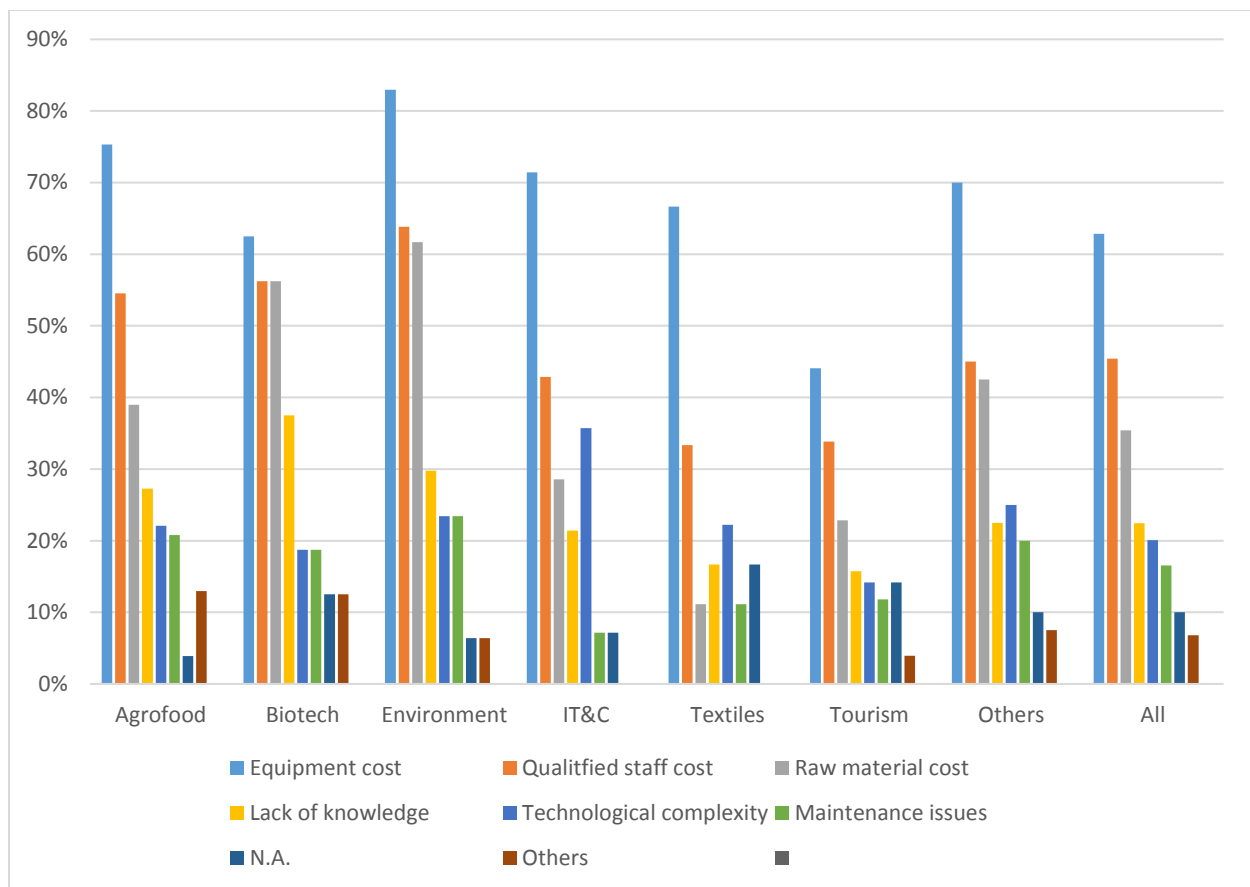


Figure 57 – Main barriers vs. economic sectors

The main barriers to use new technologies and R&D knowledge are (Figure 55):

- Equipment costs (63%),
- Qualified staff costs (45%)
- Raw material costs (35%).

This shows the necessity to have test facilities and Fab Labs with shared infrastructures and qualified personnel as service platforms which can be contracted by the companies. An Individual company cannot afford the necessary investment. The financial risk is too high.

The barrier concerning **equipment costs** is especially present in the sectors Agrofood, Environment, Textiles and IT&C (Figure 57). The test facilities and Fab Labs should be developed mainly in these sectors.

## 4 Analysis of results from the on-line questionnaire concerning I&TT offers of research organisations

### 4.1 Organisation profile

Ten research organisations from different types have participated to the survey:

- 3 universities
- 7 research organisations, from which 1 define itself as an SME

Type of organisation	Number
Higher, Secondary Education Establishment	3
Research Organisation	6
Research Organization, Small or medium enterprise (less than 250 full time employees)	1
<b>Total</b>	<b>10</b>

#### 4.1.1 Professional experience:

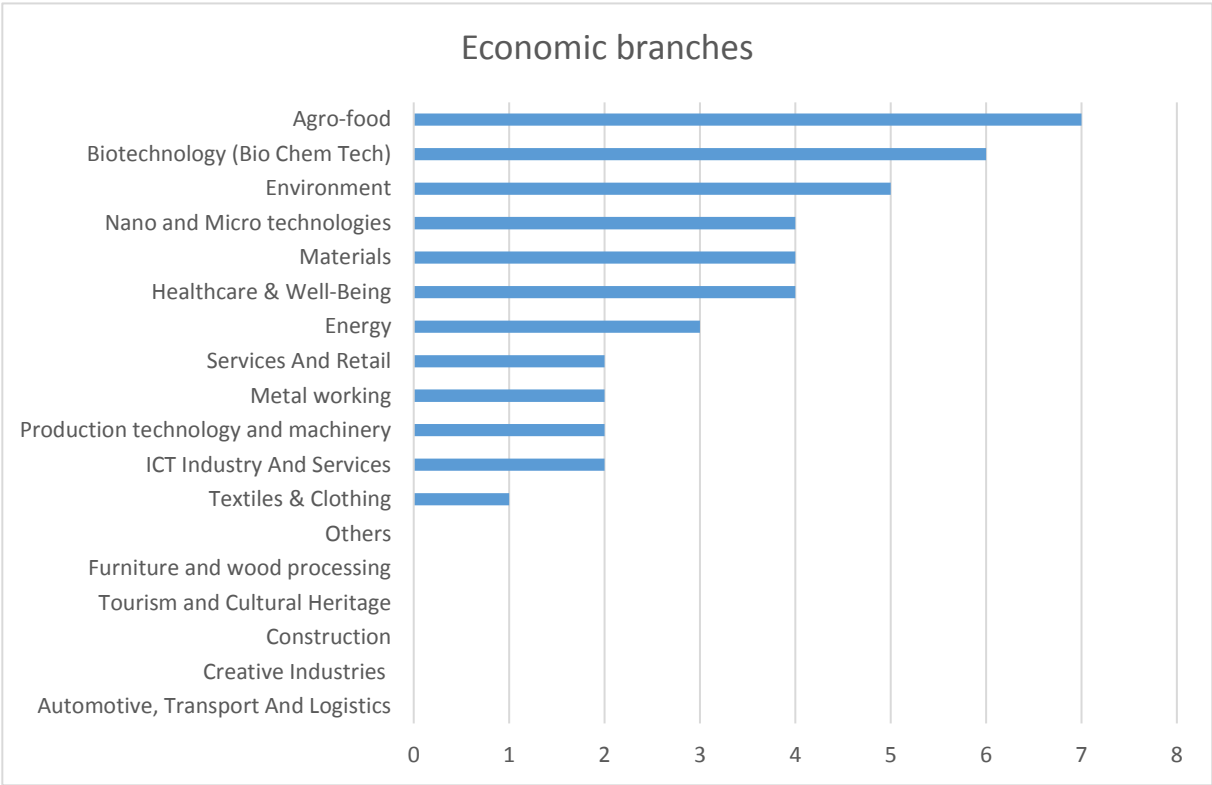
The organisations have a strong professional experience and are well established. 8 organisations have more than 15 years' experience in research. Only 2 have less.

Function in the organisation	Number
<b>Higher, Secondary Education Establishment</b>	<b>3</b>
>25 years	1
15-25 years	2
<b>Research Organization</b>	<b>6</b>
>25 years	3
0-5 years	1
15-25 years	1
5-15 years	1
<b>Research Organization, Small or medium enterprise (less than 250 full time employees)</b>	<b>1</b>
>25 years	1
<b>Total</b>	<b>10</b>

#### 4.1.2 Function in the organization:

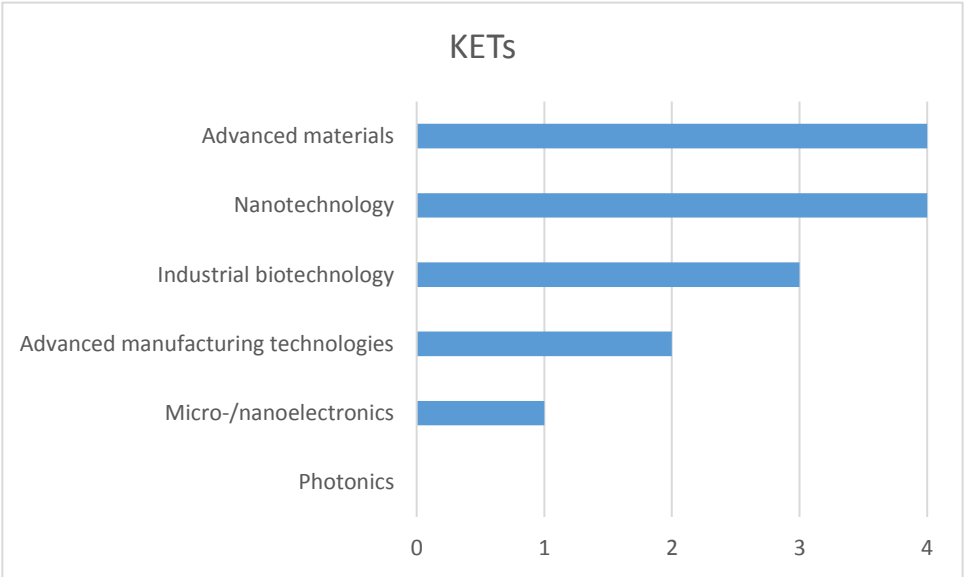
Function in the organisation	Number
Dean of the Faculty of Bioengineering	1
Head of Unit / Laboratory	1
Manager / Director of the organization	2
Researcher	3
Researcher Assistant	1
Technology Transfer Officer / Consultant	1
Vice President of the Research Institute	1
<b>Total</b>	<b>10</b>

4.1.3 In which of the following branches is your organisation active?



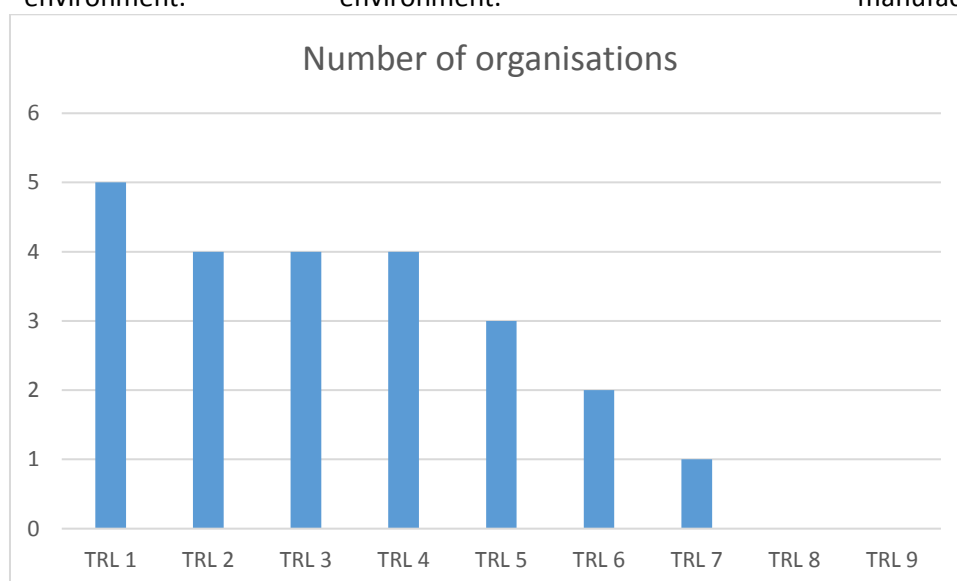
The highest number of research organisations are active in the sectors agro-food, biotechnology and environment.

4.1.4 In which of the following Key Enabling Technology fields is your organization active?



#### 4.1.5 The activities of my your organization cover the following categories (Technology Readiness Level – TRL)

- |  |   |   |   |   |
|--|---|---|---|---|
| <input type="checkbox"/> <b>TRL 1</b><br>Basic principles observed.                                  | <input type="checkbox"/> <b>TRL 2</b><br>Technology concept formulated.                             | <input type="checkbox"/> <b>TRL 3</b><br>Experimental proof of concept. | <input type="checkbox"/> <b>TRL 4</b><br>Technology validated in lab.   | <input type="checkbox"/> <b>TRL 5</b><br>Technology validated in relevant industrial environment. |
| <input type="checkbox"/> <b>TRL 6</b><br>Technology demonstrated in relevant industrial environment. | <input type="checkbox"/> <b>TRL 7</b><br>System prototype demonstration in operational environment. | <input type="checkbox"/> <b>TRL 8</b><br>System complete and qualified. | <input type="checkbox"/> <b>TRL 9</b><br>Actual system proven in operational environment (competitive manufacturing). |   |



Very few organisations are active in TRL 5 to TRL 7 and none of them in TRL 8 and TRL 9.

Companies are looking for support in high TRL, like TRL 5 to TRL 9 dedicated to validation, demonstration and qualification of technologies and systems in an industrial or operational environment. This shows a gap in the offer of I&TT services.

## 4.2 Services

### 4.2.1 Does your organization offer services to external organizations?

☐ Yes

☐ No

9 YES and 1 NO

If “Yes”:

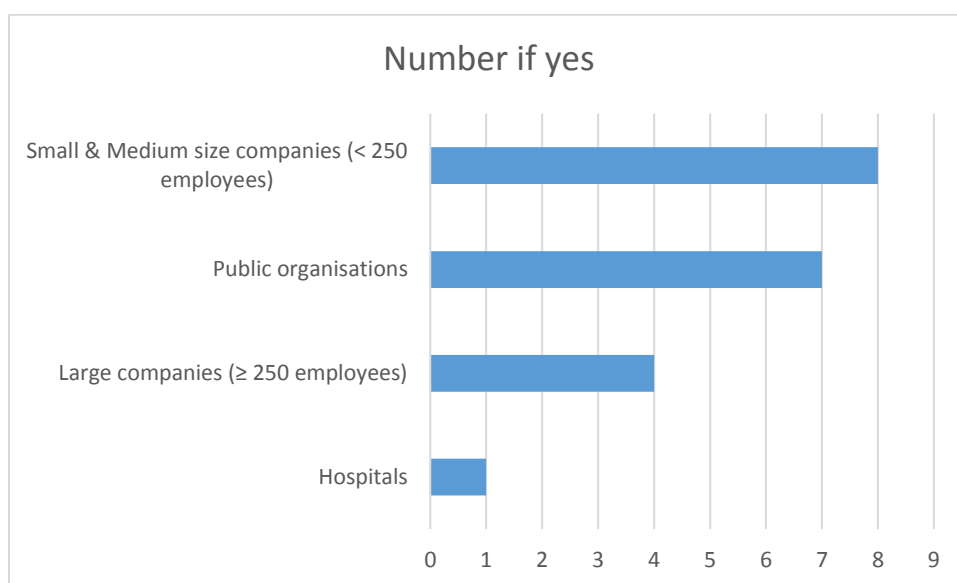
#### 4.2.1.1 What type of clients do you have?

☐ Large companies ( $\geq 250$  employees)

☐ Small & Medium size companies ( $< 250$  employees)

☐ Public organisations

☐ Others: \_\_\_\_\_



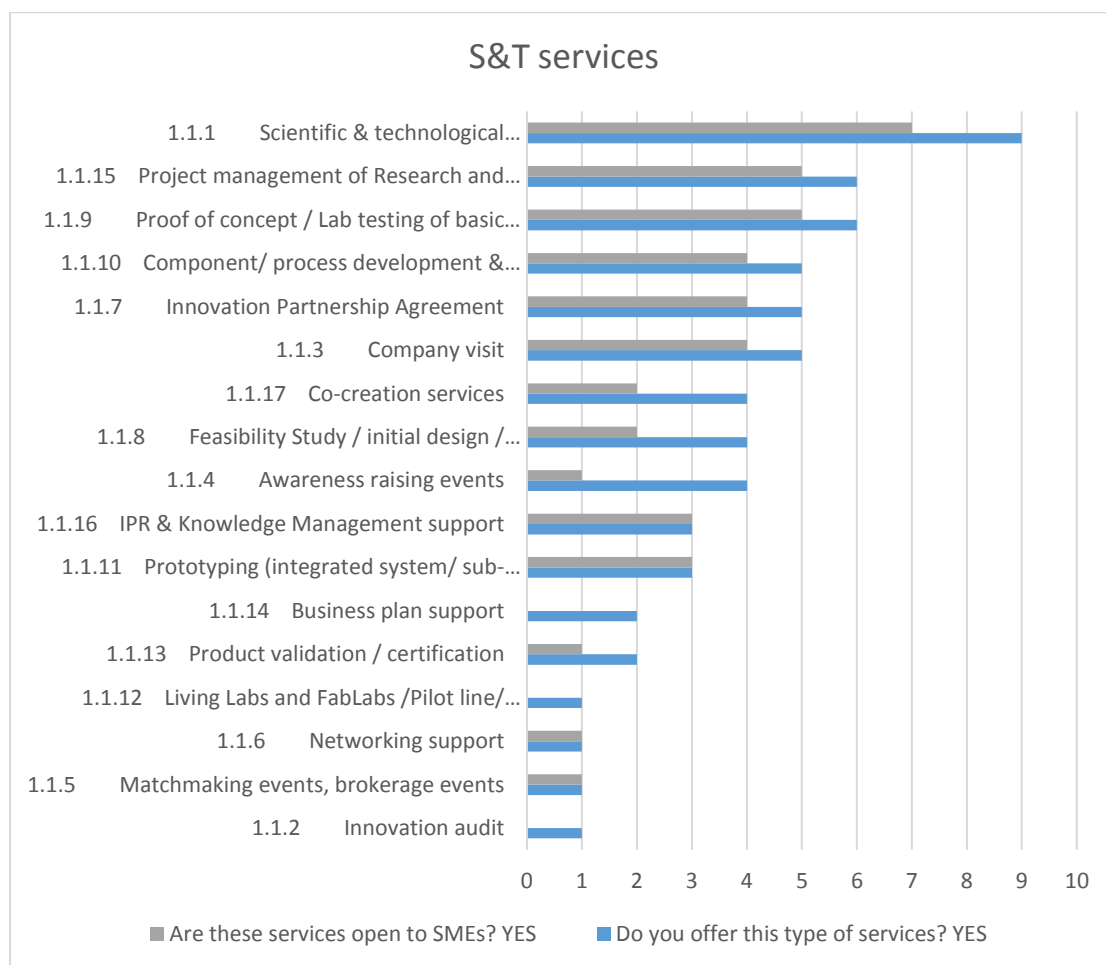
If “No”:

#### 4.2.1.2 Could you briefly explain why your organisation does not provide any services / facilities to other organisations?

Only one organization, which cannot participate to tenders

9 out of 10 research organisations offer services to external organisations mainly to SMEs, public organisations and large companies.

#### 4.2.2 Which of the following scientific & technological services related to product development does your organization offer to external organizations?



(1) All I&TT organisations of the NE region which have participated to the survey propose services in the domain of *Scientific & technological Advice/Expertise/Consultancy*. For 2 of them these services are not open for SMEs.

(2) Around 50% of *the* organisations offers services in the following domains:

- Project management of Research and Innovation projects
- Proof of concept / Lab testing of basic experimental set-up/ Characterisation
- Component/ process development & testing
- Company visits
- Innovation partnership agreements

(3) Between 30% *and* 40% offer services for:

- Awareness raising events
- Feasibility Study / initial design / Simulation
- Prototyping (integrated system/ sub-system) development & testing
- IPR & Knowledge Management support
- Co-creation services



(4) Less than 30% *offer* services for:

- Innovation audit
- Matchmaking events, brokerage events
- Networking support
- Living Labs and FabLabs /Pilot line/ demonstration line/ pre-series fabrication
- Product validation / certification
- Business plan support

**A deficit of services is especially high in the two last categories of services.**

### Deficit of services in the different phases

The following Figure 58 shows the services (marked in orange) not sufficiently developed as described in the former paragraph in the different phases of the I&TT process in the collaboration between companies and RDI organisations.

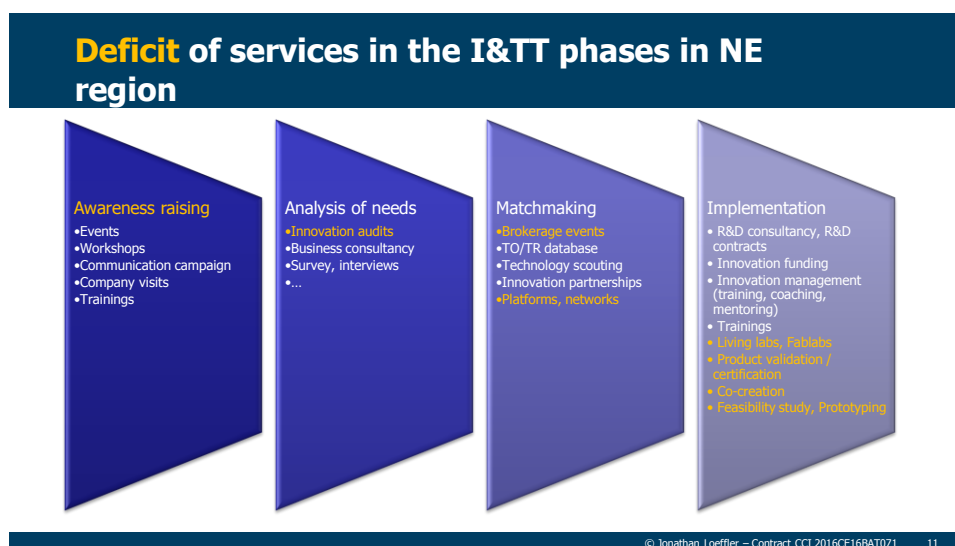


Figure 58 – Lack of services in the I&TT phases

- The awareness raising phase is not sufficiently developed. The companies need more information and an overview of the services offered.
- The services of innovation audits to analyse the specific needs of the companies is missing.
- More matchmaking events and support for new contacts in different networks are necessary to be more extended.
- In the implementation phase services on product validation & certification, feasibility study & prototyping and co-creation in the frame of FabLabs or Living Labs should be further developed.

Concerning **services opened to SMEs**, differences can be identified in the following domains:

- Awareness raising events (**specific events for SMEs should be organised**)
- Feasibility Study / initial design / Simulation
- Business plan support

- Co-creation services

Further services which were not listed in the questionnaire are proposed by single organisation:

- HR training regarding agro-zootechnics information
- Physical-chemical laboratory analysis services
- Provision of high quality biological material
- Delivery of special magnetic materials in the form of conventional wires, microfibres and thin strips with amorphous and nanocrystalline structures - compositional, morphological and topological analyses by scanning or transmission electron microscopy techniques for micro and nanomaterials - magnetic low/high temperature measurements; magnetic high frequency measurements; non-destructive / non-invasive control of materials

#### 4.2.3 From the services mentioned above, which 3 are generating the most profit?

The following list are estimations of individual organisations about which services are generating the most profit.

<i>Name of the services</i>	<b>Estimated contribution in %</b>
<i>Component/process development &amp; testing</i>	45%, 15%, 15%
<i>Proof of concept / Lab testing of basic experimental set-up</i>	45%, 10%, 10%
<i>Project Management of RDI projects</i>	40%, 10%, 2%,
<i>Scientific &amp; technological Advice/Expertise/Consultancy</i>	25%, 20%, 10%, 5%
<i>Co-creation services</i>	20%, 10%
<i>Innovation Partnership Agreement</i>	10%, 8%, 3%
<i>Awareness raising events</i>	10%
<i>Product validation / certification</i>	3%

Although the individual estimated contributions in % are very different, a trend can be observed concerning the generation of profit through the 4 types of services: *Component/process development & testing*, *Proof of concept / Lab testing of basic experimental set-up*, *Project Management of RDI projects* and *Scientific & technological Advice/Expertise/Consultancy*.

#### 4.2.4 How frequently does a company use these services on average during one year?

<b>Frequency per year</b>	<b>Number of answers</b>
< 5 times	5
5-10 times	2
11-15 times	0
> 15 times	2

4.2.5 If services are not open to SMEs, due to which of the following **barriers** (Please check all that apply)

- ☐ Communication 2
- ☐ Legal issues 1
- ☐ Cost 5
- ☐ Resources 2

Other (please specify): Institution policy

In the case where services are not open to SMEs, the main barrier is related to cost.

4.2.6 We would like to understand better your approach towards services for Small and Medium Enterprises

4.2.6.1 Do you agree with the following statements?

	1 – Disagree	2 – Tend to disagree	3 – Neutral	4 – Tend to Agree	5 – Agree
1.1.1.1 SMEs have shown a keen interest to acquire services from my organisation.	2	0	2	0	5
1.1.1.2 My organisation has a good understanding of the needs of SMEs in our field.	0	0	0	0	9
1.1.1.3 SMEs in our field are aware of our services and capacities.	0	1	3	0	5
1.1.1.4 SMEs can greatly benefit from our services.	0	0	1	0	8
1.1.1.5 Our services are more useful for large industrial partners rather than SMEs.	0	2	4	0	3
1.1.1.6 I expect the interest from SMEs for our services to grow.	0	0	0	0	9

The different answers show in a self-assessment perspective a high interest in supporting SMEs, a good understanding of their needs and a high potential for the development of services in the future. Compared to the answers given by SMEs concerning partnerships with research organisations, **a gap appears because:**

- Only around 10% of the companies have a partnership in the domain of research, technological development and innovation (RDI) with research organisations.
- The most cited reasons for not having a RDI partnership are: the right partners could not be found, no contact in this domain, not aware about the possibility, lack of information, no opportunity, no institute regionally available in the domain, lack of organisation to support the management of such partnerships, lack of funding, lack of financial resources.

The gap is mainly in the domain of awareness, information, support of the partnership process (matchmaking) and financial resources.

4.2.6.2 *Could you recall a particular case of collaboration with an SME that you would consider as an example of good practice? If yes, please describe shortly:*

- Delivering valuable genetic material that has led to increased production in sheep farms boosting profitability by over 30%
- Equipment for Plasma Decontamination Plant - The invention received the gold medal
- Making feed for ruminants
- Handles with the research and development of sensors with multi-sectoral applications using modern technologies for the printing of electrodes both on hard surfaces and on flexible surfaces.
- Research on establishing the best fertilizer solutions in fruit growing by using ASFAC-BC 0-4 growth stimulator and determining its influence on fruit production in the species: apple, cherry, sour cherry and plum.
- Developing anti-erosion solutions
- Joint development of research projects under the PN II Programme

4.2.6.3 *Does your organisation provide trainings to other organisations?*

6 Yes

3 No



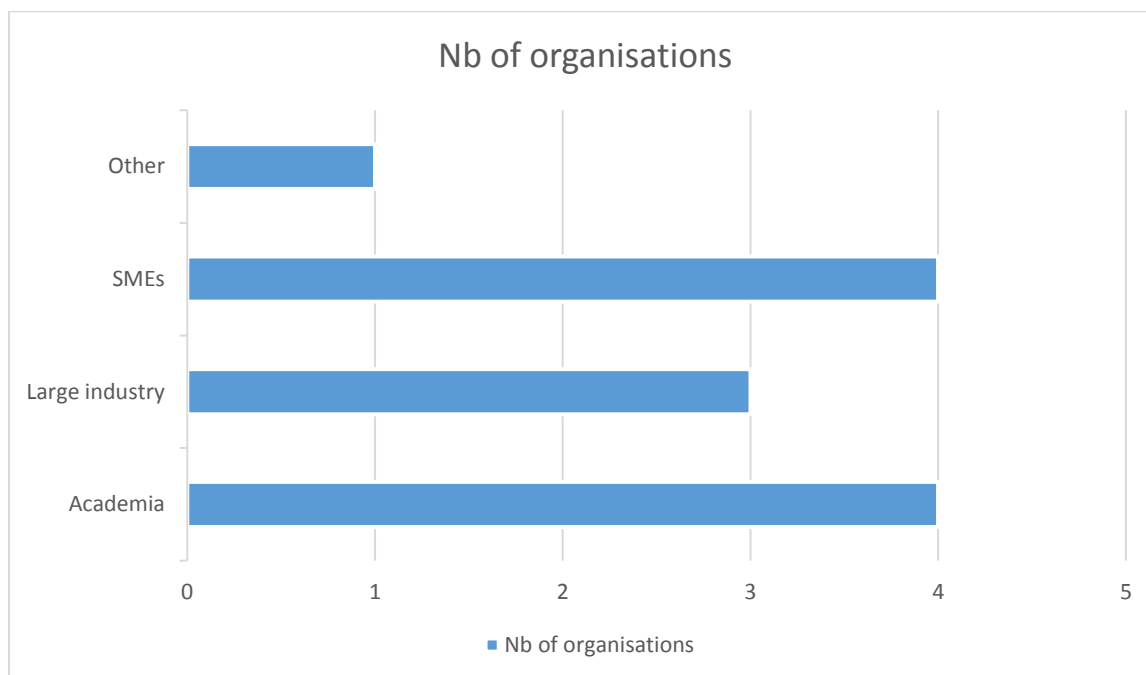
4.2.6.4 What type of background do the participants of the trainings have (Please check all that apply)?

4 Academia

3 Large industry

4 SMEs

Other (please specify): \_\_\_\_\_students\_\_\_\_\_



4.2.7 Conclusion concerning services

As explained before, in conclusion the following gap could be identified:

- The *awareness raising phase* is not sufficiently developed. The companies need more information and an overview of the services offered in the region.
- The services of *innovation audits* to analyse the specific needs of the companies is missing.
- More *matchmaking events* and support for *new contacts* in different networks are necessary to be more extended.
- In the implementation phase services on *product validation & certification, feasibility study & prototyping* and *co-creation* in the frame of *FabLabs* or *Living Labs* should be further developed.

Concerning **services opened to SMEs**, differences can be identified in the following domains:

- Awareness raising events (**specific events for SMEs should be organised**)
- Feasibility Study / initial design / Simulation
- Business plan support

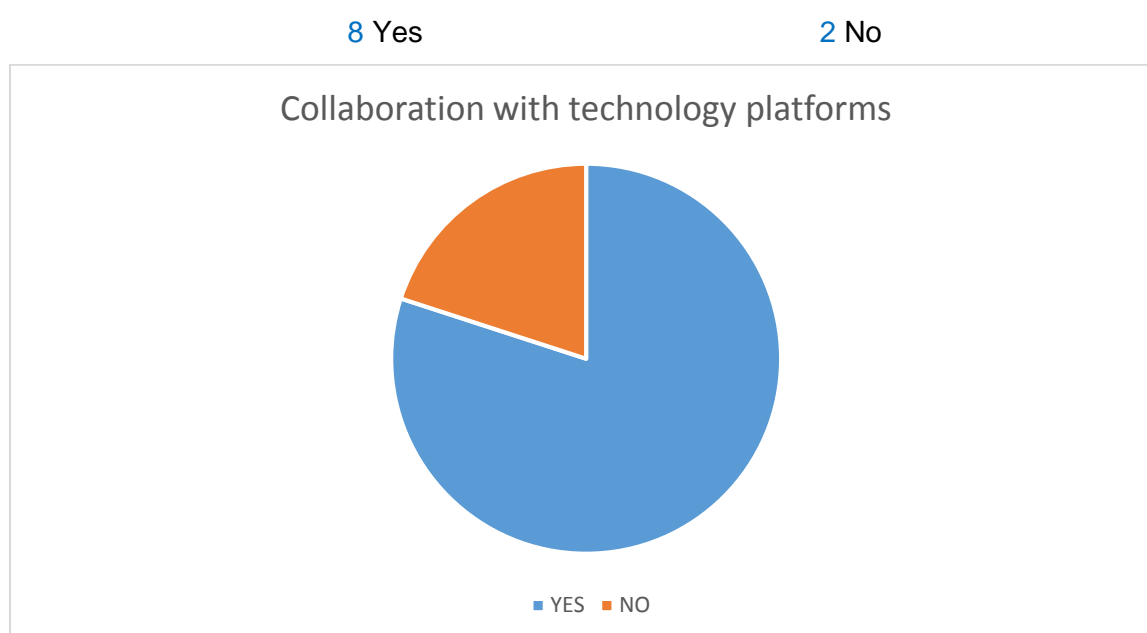
In a self-assessment perspective, the research organisations show a high interest in supporting SMEs, a good understanding of their needs and a high potential for the development of services in the future. But compared to the answers given by SMEs concerning partnerships with research

organisations, a gap appears because only around 10% of the companies have a partnership. The most cited reasons for not having a RDI partnership are: the right partners could not be found, no contact in this domain, not aware about the possibility, lack of information, no opportunity, no institute regionally available in the domain, lack of organisation to support the management of such partnerships, lack of funding, lack of financial resources.

This shows again that the gap is mainly in the domain of awareness, information, support of the partnership process (matchmaking) and financial resources.

## 4.3 Partnerships and Collaborations

### 4.3.1 Does your organisation collaborate with other Technology Platforms<sup>6</sup> on applied research projects?



#### **If No**

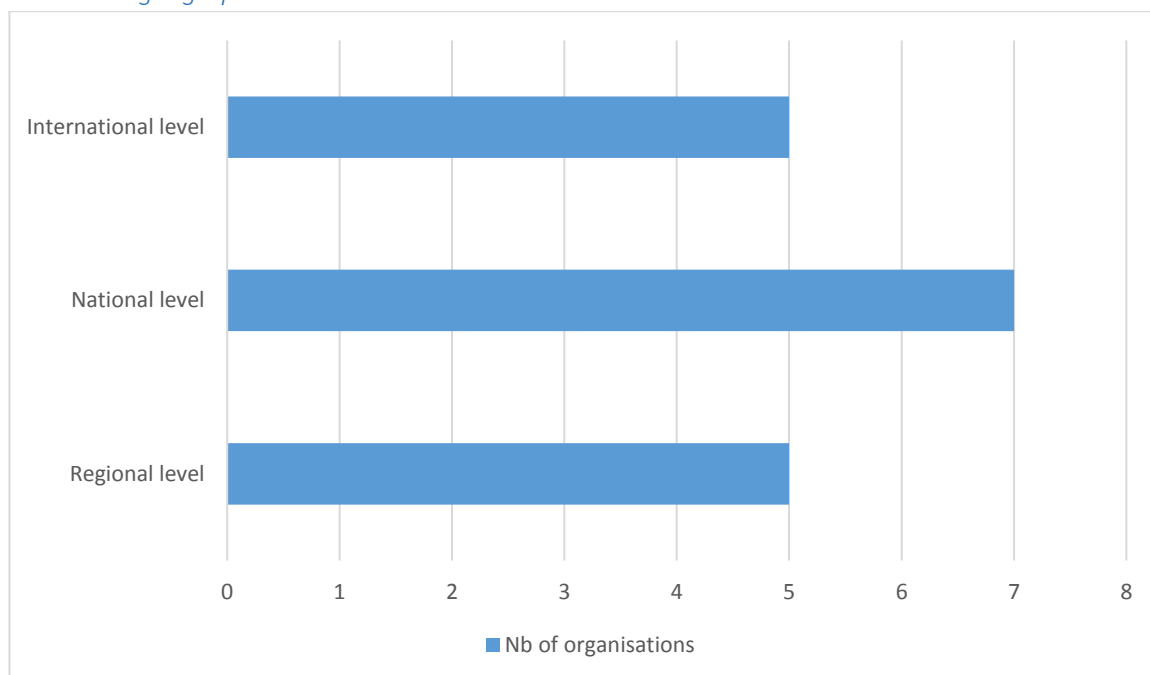
##### 4.3.1.1 Could you please explain the principal reason(s) why your organisation does not collaborate with Technology Platforms?

- Lack of interest for our activity that does not produce immediate profit, only in 5/10 years
- Lack of human resources
- Difficulty to finance these activities

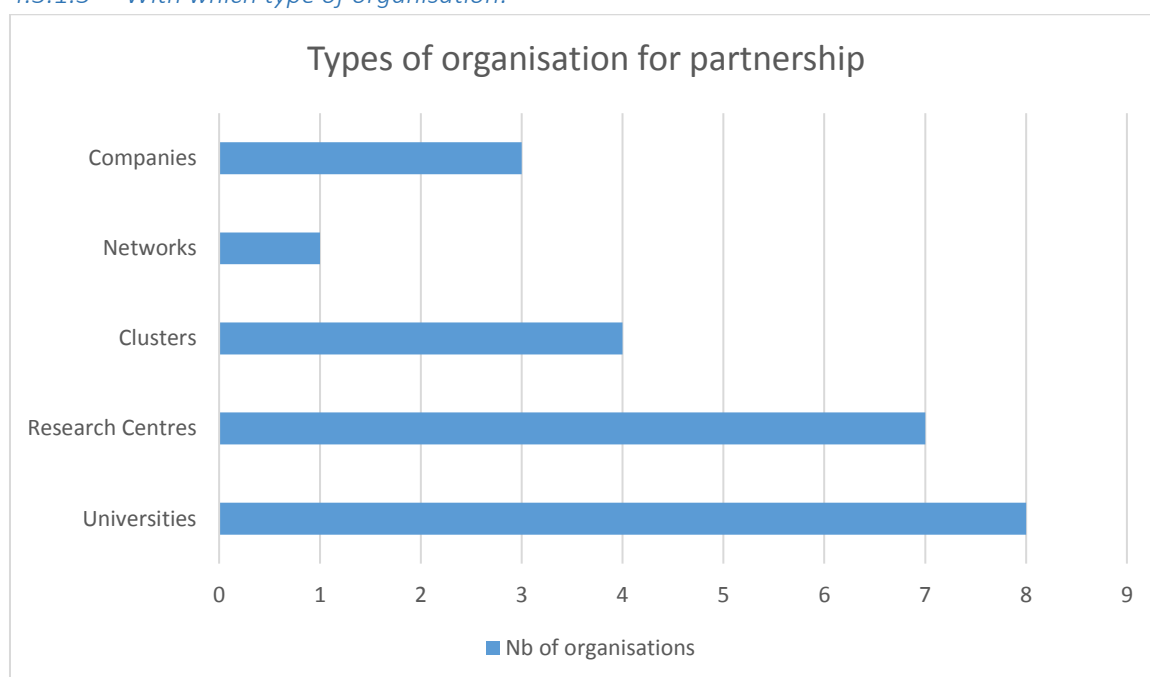
<sup>6</sup> **Technology Platforms**, i.e. a public or private organisation which provides technological services to industry/SMEs such as prototyping, demonstration lines, lab test facilities etc. so that they can bring new KETs products and services to the market. The focus is on applied and/or industrial research projects.

**If yes,**

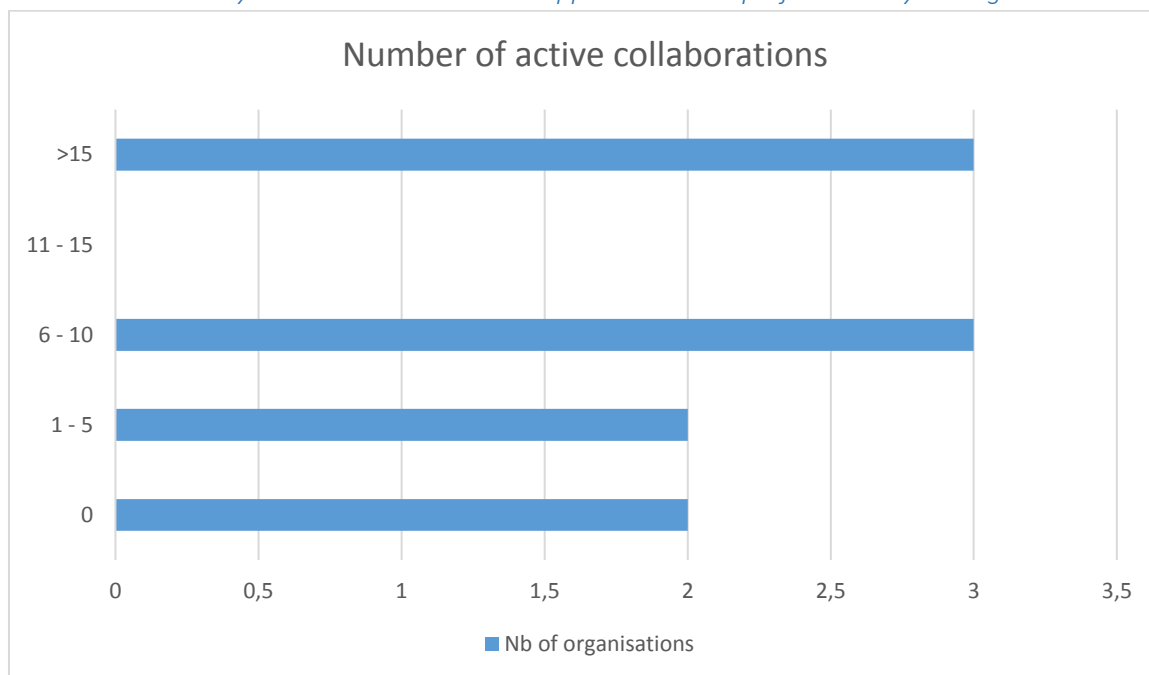
*4.3.1.2 At which geographical level:*



*4.3.1.3 With which type of organisation:*

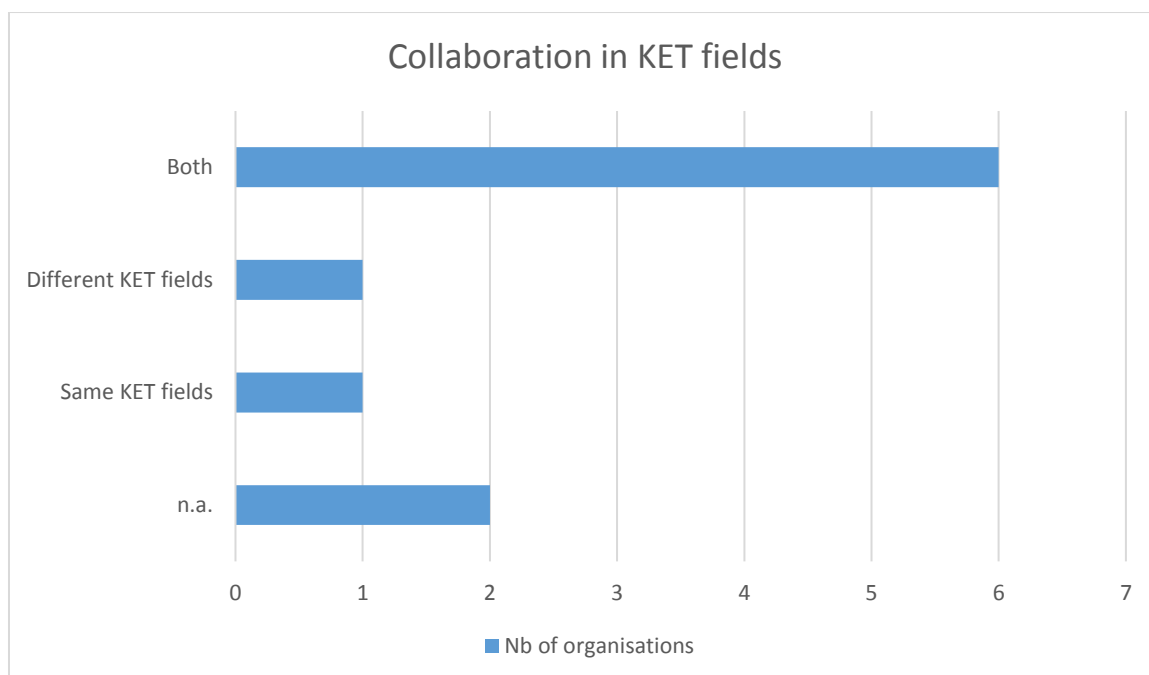


4.3.1.4 How many active collaborations on applied research projects does your organisation have?



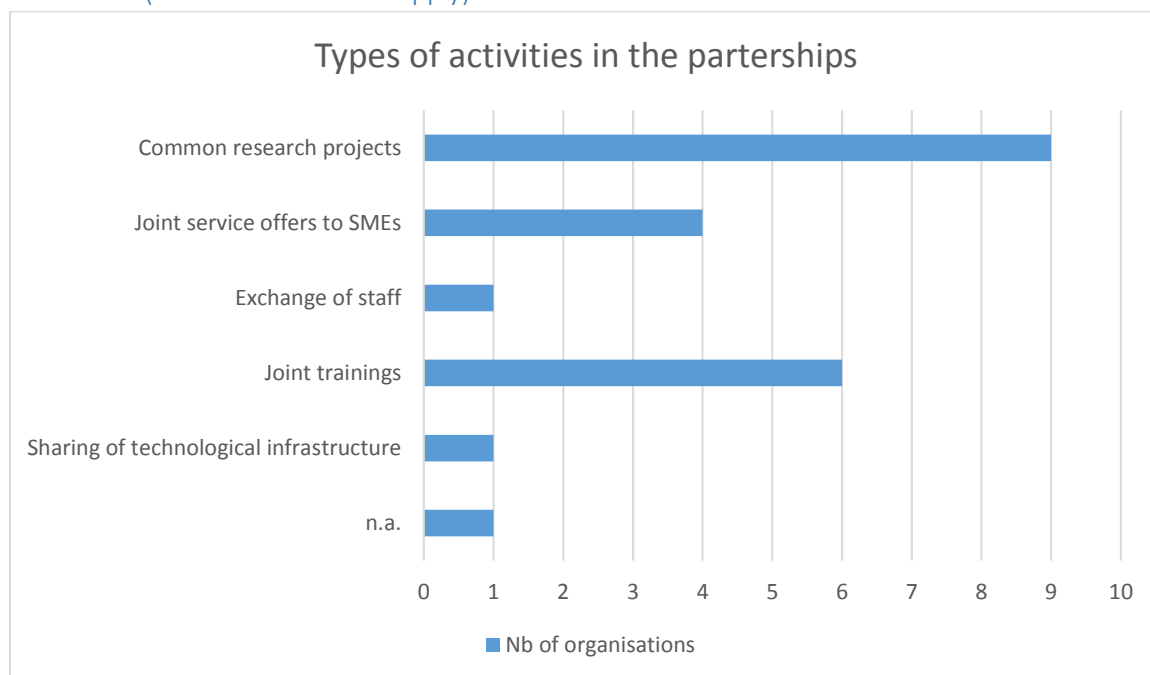
4.3.1.5 Are the collaborations within the same KET field?

- ☐ From the same KET field
- ☐ From different KET fields
- ☐ Both from the same and from other KET fields





4.3.1.5.1 Could you please indicate the type of activities that you perform with other organisations  
(Please check all that apply)?



#### 4.3.1.6 Do you agree with the following statements?

	1 – Disagree	2 – Tend to disagree	3 – Neutral	4 – Tend to agree	5 – Agree
1.1.1.7 Your organisation actively supports collaborations with other KETs Technology Platforms.	1	0	2	2	4
1.1.1.8 It is important that the collaborating KETs Technology Platform is of the same technological field.	0	1	4	1	2
1.1.1.9 Collaborating with KETs Technology Platforms from other EU countries is of great importance.	0	0	0	3	6
1.1.1.10 It is easy for your organisation to collaborate with other KETs Technology platforms.	1	0	2	4	2
1.1.1.11 Your organisation would be interested in developing new collaborations with KETs Technology Platforms from others EU28 countries.	0	0	0	1	8

#### 4.3.2 Conclusion for section 4.3

In a self-assessment perspective, the research organisations show a high interest in partnerships with other KETs platforms on applied research projects. The partnerships are mainly with research centres and universities at national level and could be further developed at regional and international level. The collaborations are both within the same KET fields as well as with other KET fields and concerns mainly common research projects, joint trainings and joint service offers to SMEs. The RDI organisations of the region are especially interested in developing new collaborations with KETs Technology Platforms from others EU28 countries.

## 5 Methodology of the analysis

The methodology was combining two approaches:

1. **A market-driven approach**, based on the needs of the companies
2. **A technology-driven approach**, based on the offers of the existing regional I&TT structures especially for applied research aspects

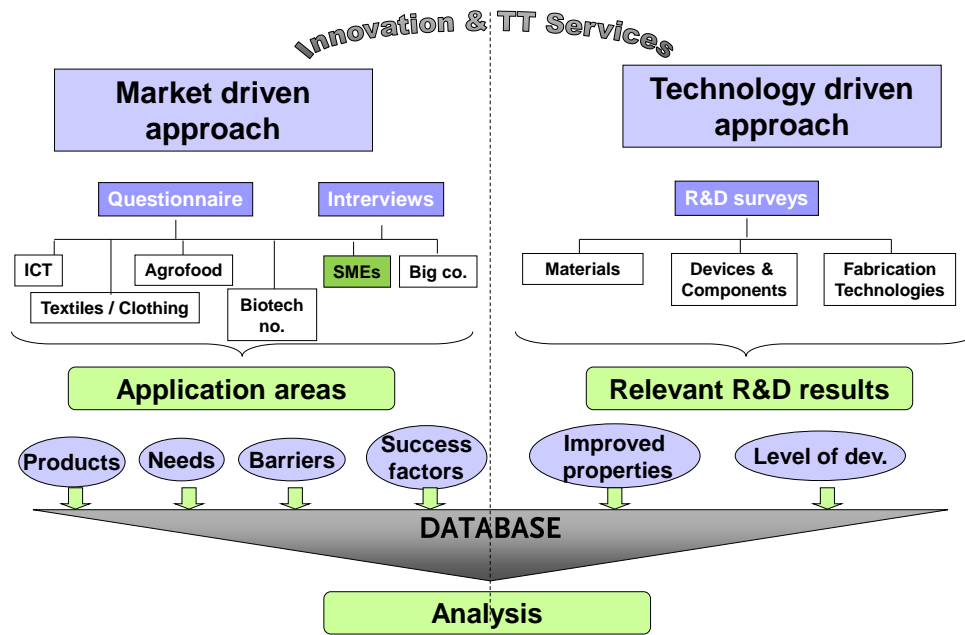


Figure 59 – Market-driven and technology-driven approaches of the methodology

### 5.1 Market-driven approach

The phase will use two main tools to identify and prioritise the ITT services:

1. Survey with an on-line questionnaire
2. Validation through face-to-face interviews

#### 5.1.1 Template form for data collection

In order to have a representative sample of companies for the survey, it is important to address different types of companies considering:

- Their size (number of employees or turnover) to differentiate between micro-enterprises, SMEs or big companies,
- Their involvement in RDI activities (% of staff in R&D department or activities) - In Europe different types of companies can be considered concerning RDI activities:
  - i. Technology pioneers (1-2%)
  - ii. Early technology followers, pioneers in implementation (3-5 %)
  - iii. Late technology followers (10%)
  - iv. Technology users (80%)
- Their economic sector – especially the sectors related to the RIS3 in the NE region.
- Their role in the value chain, e.g. Developer, Producer, User

The template of the questionnaire used for the survey is in the document named “Annex 1 Company Needs questionnaire NE final” sent on the 09.03.2017 to RDA NE.

In order to increase the acceptance for such a survey at company level, the questionnaire was short and comprehensive. It was lasting only 10-15 minutes to answer the questions.

The structure was giving the possibility to make some statistics for the different types of companies concerning their specific needs.

The questionnaire has the following three main parts:

- Part 1 - Company profile
- Part 2 - Company's objectives and partnerships
- Part 3 - Innovation management, new technologies and research knowledge

#### 5.1.2 Analysis of the data collected during the survey and formulation of recommendations

The data collected will be analysed in order to identify the needs of companies depending on their different profiles considering different category of factors:

- Their size (number of employees or turnover) to differentiate between micro-enterprises, SMEs or big companies;
- Their date of creation
- Their involvement in RDI activities (% of staff in R&D department or activities) in order to differentiate between Technology Pioneers, Early technology followers which are pioneers in implementation of new technology, Late Technology Followers and Technology Users;
- Their economic sector – especially the sectors related to the RIS3 in the NE region

Statistics will be first made for each category of factors, but also by crossing the different factors and analysing the differences and the priorities for each sample groups of companies for the questions in sections 2 and 3 of the questionnaire of Annex 1. For example by crossing:

1. Economic sector and size of the company
2. Economic sector and involvement in RDI activities
3. Involvement in RDI activities and size of company
4. Economic sector, involvement in RDI activities and size of company
5. ...

The possibility to cross the factors will depend on the number of answers in each category in order to have a representative number of companies high enough to still make statistics.

#### 5.1.3 Validation of the statistical results of the survey through interviews with company representatives

At the end of the questionnaire for companies, there was the possibility for them to participate on a voluntary basis to a technology assessment, which is an interview to identify more in details the needs of the company and which will at the same time help us to validate the results of the survey, by asking more open questions to the company. It would help to make recommendations based on several case studies.

A sample of 5 companies for each RIS3 area was recommended for the validation process. This represents a total of 30 interviews at least.

The questions for this technology assessment should be developed in a 2<sup>nd</sup> step after a first analysis of the results of the survey. It can be done on the phone or in the frame of a company visit e.g. by RDA NE experts in the different RIS3 fields, who are involved in the implementation of the Smart Specialisation Strategy.

## 5.2 Technology-driven approach

**The technology-driven approach** was based on the offers of the existing regional I&TT structures especially with a focus on applied research aspects and on the collaboration with companies in industrial innovative projects.

### 5.2.1 Methodology for gathering information from existing ITT structures in the NE Region

This phase did also use a survey to make an inventory list of existing ITT services and facilities offered in the region **with a focus on applied research and company driven projects.**

The scope of the survey and interviews was to serve as an effective tool for the analysis of the supply side<sup>7</sup> of ITTs services and infrastructures. The goal was to understand the gaps, limitations and barriers that currently exist in the service supply as well as the nature and impact of the collaborations of ITT Technology Platforms both among them and with the industry / Small and Medium Enterprises (SMEs). In particular, the objectives of the survey were to:

- Collect descriptive knowledge **with a focus on applied research and company driven projects** regarding the nature of the available services / facilities and at the same time **assess their accessibility to SMEs and companies** demonstrated by existing experience or newly developed services dedicated to companies.
- Collect information on collaborations among ITTs TPs shedding light at the existing collaboration networks and facilitating the identification of good practices that resulted in benefits for the industry / SMEs (e.g. greater range of services, wider geographical coverage, etc.).
- Study and explore potential disablers that might limit the accessibility to services and, ideally, point to solutions for lifting them.
- Enhance the initial inventory of ITTs TPs in the region.

### 5.2.2 Template form for data collection

The template of the questionnaire used for the online survey is in the document named “Annex 2 Questionnaire ITT organisations NE final” sent on the 24.03.2017 to RDA NE.

The questionnaire has the following structure:

- Section 1 – Organisation profile
- Section 2 – Type of services offered to external organisations and especially SMEs
- Section 3 – Partnerships and collaborations

The goal of this questionnaire was to identify the experience of the ITT organisation, the type of services already offered especially to companies and the existing partnerships with other technology platforms at regional, national or international level.

This will give the possibility to compare the existing offer of services with the needs of the companies identified with the first questionnaire and especially to identify the gaps.

---

<sup>7</sup> The supply side refers to KETs TPs that provide services and facilities to external organisations.

### 5.2.3 Analysis of the data collected during the survey and formulation of recommendations

For the analysis of the data collected the following factors will be considered:

- The type of organisation e.g. public or private
- The branches and the Key Enabling Technology fields in which the organisation is active
- The Technology Readiness Level covered by the services offered

Statistics will also be first made for each category of factors, but also by crossing the different factors and analysing the differences and the priorities for each type of ITT organisations for the questions in sections 2 and 3 of the questionnaire of Annex 2.

### 5.3 Identification of the gaps and matches between needs and offers

The comparison of the results of the analysis of the two approaches, will permit to identify the gaps and the matches between needs of the companies and offers of services from the ITT organisations in the following domains:

- Key technologies and industrial branches
- Services offered in the following technology transfer phases:
  - *Awareness raising phase* (events, information campaign...)
  - *Phase for the analysis of needs* (company visits, innovation audits and business consultancy...)
  - *Matchmaking phase* to initiate the innovation partnerships (brokerage events, technology requests and offers...)
  - *Implementation phase* of the collaboration projects (consulting and advice contracts for proof of concept, management of IPR, investment analysis, recruitment of qualified personnel, technology audit, technology watch, coaching and mentoring with experts, prototyping, demonstration, creation of spin-offs and start-ups, feasibility studies, mentoring in innovation management...)
- Categories of needs for SMEs in the domain of innovation and technology transfer
  - Contacts for innovation partnerships (at regional, national, international level)
  - Integrate New Knowledge / Technology in products or services through research contracts in order e.g. to develop prototypes, make some feasibility tests or have R&D consultancy support.
  - Innovation Financing / funding to perform the development steps
  - Intellectual Property Rights support
  - Innovation Management support by Training / Coaching / Mentoring measures
  - Business support to reach new market by performing technology scouting, benchmarking or market survey
  - Legal support

The analysis has been focused on the following main areas of priority:

1. Support the competitiveness of companies through new product development in collaboration with Universities and/or R&D organizations
2. Support the financing and foster the knowledge exchange at regional level
3. Achieve a shift of mentality and collaboration culture at University, R&D organizations and SMEs

### 5.3.1 Support competitiveness of companies

The competitiveness of companies can be improved by the development of innovative products and/or services and by the internationalisation of their activities.

Reinforcing knowledge triangle to promote closer links between higher education & research sector and business sector is a key factor to support the competitiveness. This could be done through the implementation of development of new products based on exchange of best practices and cooperation at regional level. A priority should be to develop sustainable economic models based on creativity and innovation in support of increasing competitiveness in firms and SMEs.

The main challenges are, on one hand, how to trigger private investment in innovation and on the second hand, how to translate these investments into productivity gains at the level of companies to support competitiveness of innovative firms in the region.

It should be highlighted the importance of the bottom-up approach to innovation and the promotion of an open environment for new ideas, taking advantage of the existing local strength to unleash potential and develop new solutions, which can bring about gains in productivity of the small companies and firms.

There is also a need for internationalization of companies. An increased collaboration of companies with partners from Europe and especially the Danube area would be desirable as internationally active entities can better ensure effective I&TT. Companies are more easily capable to find the best suitable business partner in the value chain and thereby, to make use of complementary competencies and to create synergies. However, until now, there are various obstacles to this objective such a lack of innovative thinking at business level and of financial resources.

### 5.3.2 Support financing and knowledge exchange

To support innovation in firms, public authorities should promote financial schemes to support a closer cooperation of the business sector with academia and research organisations to facilitate the technology transfer to them. The role of innovation, as a key tool in the development of new products, should be promoted by organising dedicated workshops and brokerage events to increase awareness among stakeholders.

Better communication of the innovation policies is a key step towards a more efficient involvement of stakeholders and an active engagement of business sector, as key drivers of innovation. This should be based on an active participation of citizens, a proper understanding of the role of innovation in everyday life and the dissemination of the scientific and technical knowledge to the society as a whole.

A clear and dynamic communication on innovation and technology transfer topics emphasizing their benefits for people would enable the participation of stakeholders and would help them to clearly articulate their motivation and needs. A better communication could be done by initiating a platform devoted to exchange of information and best practice experiences in the implementation of research and innovation policies

### 5.3.3 Shift of mentality and improved collaboration culture between RDI and SMEs

Recent European policies in research and innovation highlight the need to develop a new culture closer to innovation and technology transfer and based on more creativity and risk-taking activities. The shift in mentality of people requires a relatively long period of time and it is a very complex process, in part because of the high heterogeneity of various areas in a region. A change in mind-set towards more innovation is needed for all stakeholders involved and at all steps of the innovation

value chain, mainly for those stakeholders which are closer to the education system, in universities and research organisations, as well as in firms and companies. This should be done by promoting special programmes to foster innovation culture among entrepreneurs or to undergo vocational training for young students in universities.

Also, the promotion of managerial skills at the leadership of universities should be encouraged through additional courses, dissemination events and organising Danube summer schools for enhancing cooperation and for exchanging of best practices.



## 6 Glossary

RDA: Regional Development Agency

NE: North-East

RDI: Research Development and Innovation

I&TT: Innovation & Technology Transfer