"Survey of Barriers to Innovation Bosnia and Herzegovina"

Project title:

MAPEER SME - Making Progress and Economic enhancement a Reality for SMEs

Public report on the analysis of

SMEs and stakeholders' needs, requirements and feedback to overcome barriers for research & innovation activities in Bosnia and Herzegovina

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Dissemination Level

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

Remark
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Table of Contents

Index of Tables

Index of Figures

1. Executive Summary

Purpose of the Survey and Barriers to Innovation report for Bosnia and Herzegovina is to collecting of key data on the subject of RTD and Innovation activities undertaken by SMEs. It is a continuation of National Report on SME R&D&I Programmes and Initiatives project MAPEER's - WP2 (written during May and July 2010), focused on SMEs and Business Supporting Organizations and Institutions active in Bosnia and Herzegovina, and their experiences, needs, barriers and objectives in conducting Research, Technology Development and Innovation (RTD&I) activities. Report is the result of survey performed on SME and Business supporting sector which have gathered relevant data on the issue of SME vs. RTD programmes (active and closed) in the period of last five (5) years. It's also a result of a number of interviews with managers of RTD programmes and/or responsible persons in National/Regional Ministries. Hopefully, this document and its conclusions will significantly contribute to better understanding of RTD&I frame in Bosnia and Herzegovina from the perspective of SME sector.

In the survey, following subjects and entities were addressed with the goal in collecting of relevant data on RTD&I activities:

1. Local SMEs, in total number of 38 (n=38), out of which 20 RTD active and 18 RTD inactive (according to the default project MAPEER criteria). SMEs are addressed with MAPEER questionnaires (sent by mail or fax or delivered personally) or face-to-face interviews.
2. SME stakeholder organizations/institutions, in total number of 4 (n=4). They have been addressed with MAPEER questionnaire designed for entities considered as Business Supporting Organizations. Additionally, this group also includes representatives from National/Regional Ministries, Institutes, Universities and other SMEs stakeholder entities, which have been addressed by face-to-face interviews and through participation on the project MAPEER Round table event organized in April 2010 (with participation of 30 representatives of SME stakeholder group).

Collected data from filled questionnaires and notes from face-to-face interviews were transferred to on-line tool for conducting of analysis (www.surveymonkey.com) and managing of information.

Like in the other European countries, share of SMEs in the economy of Bosnia and Herzegovina is predominant. SME sample used for MAPEER survey is defined through the analysis of available R&D&I programmes in Bosnia and Herzegovina, where MAPEER team collected information on the SMEs - programme beneficiaries. Reasons for this decisions are in facts that official statistics for SMEs in BiH does not comply with EU methodology and practically does not exists, and, on the other hand, general conclusions and evaluations of SME stakeholders are confirming SMEs are still not devoted to RTD&I activities and that the percentage of the ones which can be considered as RTD programme active vs. the total number of SMEs in Bosnia and Herzegovina (in the total accordance with MAPEER criteria) is extremely low (under the figure of 0.2%).

Table 1: SME profile – Bosnia and Herzegovina

	RTD programme active SMEs	RTD programme inactive SMEs
Located in technology park	0%	0%
Integrated in cluster/technology platform	0%	16,70%
Year of foundation	60 % are older than 10 years	33 % are older than 10 years
FTE dedicated to RTD activities	55 % of SMEs has dedicated up to 10% of FTE for RTD	61 % of SMEs has dedicated up to 10% of FTE for RTD
Annual RTD expenditure to total expenditure	45 % of SMEs has RTD expenditure of up to 10 % of total annual expenditures	55 % of SMEs has RTD expenditure of up to 10 % of total annual expenditures
RTD income in relation to total income	45 % of SMEs has up to 10 % of total income coming from RTD activities	72 % of SMEs has up to 10 % of total income coming from RTD activities
Competition	Moderate competition environment	Strong competition environment
Internationalization	Weak (local/regional market orientation)	Weak (local/regional market orientation)
Current sales from new or substantially improved products/processes	30% of RTD active SMEs have more than 50% of current sales coming from new or substantially improved products /processes	33% of RTD active SMEs have more than 50% of current sales coming from new or substantially improved products /processes
Job creation/sustainment	up to 5 job positions	up to 5 job positions
Own RTD department	35%	16,70%
Patents	0 % has patents	0 % has patents
RTD and innovation strategy defined	40%	22%
Development of totally new products/processes	65%	48%
Satisfied with internal RTD	35%	35%
Devotion on more resources on RTD&I	55 % devote more resources	22 % devote more resources

Source: MAPEER Survey 2010

In total, SMEs in Bosnia and Herzegovina are interested in R&D&I programmes, but facing many barriers to overcome, and having many needs to fulfil in order to involve R&D&I activities in their business on the daily bases. General impression is that a number of supporting activities should be initiated simultaneously in order to get fast outputs indicating actual enhancement in the scope of SMEs vs. R&D&I programmes.

Going from chapter to chapter of this report, it is inevitable to once more indicate the problem of unarranged statistics on SME sector in Bosnia and Herzegovina. Data regarding SME sector and its R&D performances can not be found on EUROSTAT, OECD databases, European Innovation Scoreboard or other statistical databases. Adjustment of statistical system for monitoring of SME sector and its performances (including the R&D) is a basic precondition for Bosnia and Herzegovina, to start better policy making for SMEs in general.

For SMEs in Bosnia and Herzegovina, both RTD programme active and RTD programme inactive, significance of barriers for their involvement in R&D&I activities are almost equally

distributed between knowledge, financial, program related and external. Therefore, the measures and future programmes should have an accorded multiple impact.
Analysed needs of local SMEs are confirming presence of strong demand for actions undertaken by the organizations/institutions considered as SME stakeholders, aimed on raising the internal capacities for RTD (knowledge), creation of financial schemes of support to RTD (with increased amounts of financial resources for distribution) and adjusting of available RTD programmes to fit more to SMEs capabilities and capacities.
In order to raise competitiveness of SMEs, especially in terms of R&D&I performances, Bosnia and Herzegovina needs to:

1. Strengthen capacities of National/Regional authorities, Research organizations and SMEs to prepare, participate and perform R&D&I Programmes.
2. Increase the total amount of financial resources for R&D&I programmes for SMEs, as well as the amount of grants/loans per project proposed by SME.
3. Create better environment for R&D&I activities including the development of specialized laboratories for specific industrial sectors.
4. Promote R&D&I activities of SMEs, as an option for development/improvement of products and increase of income.

2. Introduction

The present document is deliverable 3.3 (Survey & Barriers National Report) under WP3 - End-users' (SMEs and EU stakeholders) needs, requirements and feedback to overcome barriers for innovation activities.

National questionnaire surveys and in depth interviews with SMEs targeted to identify and capture the needs and barriers with respect to innovation that the different types of SMEs actually face in every country and the various innovation strategies of those SMEs. In parallel, they also targeted to gather the SMEs views on existing national / regional programmes characteristics in comparison to their needs.

Overall, this National Reports provides a concise presentation of the MaPEeR SME findings with respect to Bosnia and Herzegovina:

- SMEs main characteristics, needs and barriers to innovation at cross-sectoral level and within the respective national context.
- The innovation processes (alternative innovation pathways, role of research for SME) followed by the different types of SMEs in the respective countries
- The strengths and weaknesses identified per type of SMEs (RTD active and inactive)
- Recommendations on how to overcome barriers to innovation from the different points of view (SMEs and SME stakeholders)

These findings were collected through a questionnaire survey and in depth interviews with SMEs aiming to identify and capture the needs and barriers with respect to innovation that the different types of SMEs actually face in every country and the various innovation strategies of those SMEs. In parallel, they also targeted to gather the SMEs views on existing national / regional programmes characteristics in comparison to their needs.

In more detail, input for the report via the different main actors:

On line questionnaire – Interviews	• Individual SMEs	• SMEs characteristics (SME Profile) • Benefits from participating in national / regional R&D programmes (R&D active SMEs) • Reasons for not participating (R&D inactive SMEs) • SMEs needs, barriers and interests in innovation • Key factors for programme success and failure • Programme characteristics responding to SMEs' needs • Perceived impact of programme on SMEs • Views on future expectations about national / regional programmes • Views on good practice cases of programmes
Interviews	• SME associations/ Clusters	• Sectoral specificities in terms of needs, barriers and interest to innovation • Key factors for programme success and failure • Programme characteristics responding to SMEs' needs • Sectoral or general views on current programmes as well as future expectations • Sectoral or general views on good practice cases

The report is presented through 5 main chapters. Apart of the Executive summary (Chapter 1.) and Introduction part (Chapter 2.), the report has:

- National SME landscape and structure (Chapter 3.), with information on the present situation in the SME sector in Bosnia and Herzegovina in terms of doing R&D, participation in RTD programmes, their performances and other relevant elements, based on available information gathered from country's strategic documents.
- Main findings on SMEs from MAPEER SME project (Chapter 4.), based on actual findings and opinions expressed by RTD programme active/inactive SMEs collected in comprehensive interviews conducted on the sample targeted by MAPEER project.
- Main conclusions (Chapter 5.) of the report, which could serve policy makers in defining future measures, actions and programmes for support to R&D projects of SMEs.

3. National SME landscape & structure

In order to understand the National SME landscape and structure for Bosnia and Herzegovina, it is important to know the following facts:

Bosnia and Herzegovina is a decentralised country, consisted of two entities (which are most similar to federal units) – Republika Srpska and Federation of BiH. Since there is no organized gathering of data on SME performances, which could provide an overview for the whole country, all the information for the report were collected by using the statistics and strategic documents of Republika Srpska (RS) and Federation of BiH (FBiH). Country level data are basically a sum of the data collected on the entity levels.

3.1. Analyzing the Number of SMEs per country in more detail

The SMEs structure in Bosnia and Herzegovina is estimated on the basis of available data. There are no precise data, because there is no SME definition on the state level, and different institutions (statistics and tax institutions, Pension fund, etc.) present SMEs data in different ways.
The total number of enterprises obtained is based on the data from:

1) "Strategy of SME development in Bosnia and Herzegovina (BiH) 2009 – 2011" (national level),
2) "Strategy of SME development in Republic of Srpska (RS) 2006 - 2010"
3) "Development of small and medium entrepreneurship in Federation of Bosnia and Herzegovina (FBiH)",
4) "Innovation activities statistics in Republic of Srpska for the period 2006 - 2008" – experimental pilot research conducted by the Institute for statistics of RS.

Bosnia and Herzegovina has 161.295 of SMEs. According to the EU SME Definition, most companies in BiH are SMEs (more than 96 %).
From the total number of SMEs, 93,6% are the ones with not more than 9 employees; 5,5% have between 10 – 49 employees, while 0,9% employs 250 people and more.

3.2. Analyzing the Number of SMEs divided per MaPEeR SME sectors

Distribution of SMEs per main sectors, shows predominance of Trade and Services sector where more than 50% of SMEs are actually active.

1. Wholesale and Retail sector - 40,04%,
2. Catering industry (hotels and restaurants) - 13,51%
3. Manufacturing - 13,03%
4. Transport, storage and communication - 9,26%
5. Real estate, rental and similar services - 7,47%
6. Construction - 5,02%
7. Health and social services – 0,33 %

Regarding the MAPEER SME defined sectors of ICT and Environmental technologies, there is no specific data available for these sectors.

Distribution of SMEs in sector is presented in the following table.

Table 2. Distribution of SMEs per sectors in BiH

	Sector	% SME per sector
Production	Agriculture, hunting and forestry	3,04
	Fishing	0,07
	Mining	0,24
	Manufacturing	13,03
	Electricity, gas & water supply	0,39
	Construction	5,02
Services	Trade, certain repair motors	40,04
	Catering	13,51
	Transport, storage, communication	9,26
	Financil intermeditation	0,62
	Real estate, renting, services	7,47
Non productive	Public administration; defence; compuls. social security	3,85
	Education	0,08
	Health and social welfare	0,33
	Other social & personal service	2,06
	Extra-territorial organizations and bodies	0,00
	Other	0,99
	TOTAL	100,00

Source: Small and Medium sized Enterprise Development Strategy in Bosnia and Herzegovina 2009 - 2011.

3.3. Analyzing the number and performance of RTD active/inactive SMEs on country level (national findings…)

R&D indicators are based on "Innovation activities statistics in RS for the period 2006 - 2008" – experimental pilot research conducted on the sample of SMEs in the entity Republic of Srpska. This experimental pilot research is conducted by the Institute for statistics of Republic of Srpska and presents the only relevant information on R&D activities of SMEs in Bosnia and Herzegovina. R&D performances of SMEs are monitored in terms of introducing innovations in products, processes, marketing and organization. The research have confirmed following:

- Product innovations have been introduced by 28,60% of SMEs.
- Process innovations have been introduced by 37,38% of SMEs,
- Marketing innovations have been introduced by 30,18% of SMEs,
- Organizational innovations have been introduced by 28,38% of SMEs.

When analysing the expenditure of SMEs for implementation of their R&D activities, innovative small enterprises are financing R&D activities in the amount of 4,01 % of their

annual income. Additionally, innovative medium enterprises are financing R&D activities in the amount of 4,35 % of their annual income. The structure of expenditure is shown in the following table:

Table 3. Expenditure for R&D activities (percentage of annual income)

Type of expenditure	Expenditure by small innovative enterprise (percentage of total annual income)	Expenditure by medium sized innovative enterprise (percentage of total annual income)
Internal R&D	0,31 %	0,63 %
External R&D	0,03 %	0,09 %
Acquisition of machinery, equipment and software	3,41 %	3,17 %
Acquisition of other external knowledge	0,01 %	0,01 %
Education and training for innovation activities	0,09 %	0,09 %
All forms of design	0,02 %	0,03 %
Marketing expenditure	0,14 %	0,34 %
Total	**4,01 %**	**4,35 %**

3.4. The innovation processes (alternative innovation pathways) followed by the different types of SMEs in the respective countries (as reported in national studies and available surveys)

So far, studies and surveys concerning the innovation processes of SMEs in Bosnia and Herzegovina have not been conducted. However, all strategic documents are registering the need to provide better support to the processes of innovation and technology development, in order to raise competitiveness of local SMEs in terms of local, regional and global economy. In the situation of inexistence of operative links between the scientific and research institutions, local SMEs have following alternatives for their RTD projects:

- Individual implementation, with no systematic link with scientific and research institutions,
- Waiting for responsible ministries and institutions to launch the call for submission of RTD projects, in order to gain financial support, with possible inclusion of scientific and research organizations as partners.

3.5. The strengths and weaknesses identified of SMEs as reported in national studies

When the main strengths of local SMEs are analysed, strategic documents issued by the local authorities always give predominant significance to natural resources and their quality and availability to SMEs. According to Global Entrepreneurship Monitor report from 2008, the economy of Bosnia and Herzegovina is considered as factor – driven, where natural resources (mines, hydro-power, forests, etc.) are main pillars of national economy.

Low price of skilled and qualified personnel is also very often nominated characteristic of local SME sector and its competitiveness, but in terms of R&D projects this issue is not so relevant (more relevant for productivity).

On the other hand SMEs in Bosnia and Herzegovina have:

- Insufficient internal capacities for innovation and technology development,
- Poor links with the scientific and research institutions,
- No locally available laboratory capacities for tests and research projects,
- Lack of financial resources for research projects.

3.6. Analyzing other national elements of importance (highlighting national specific elements)

Bosnia and Herzegovina has a tradition of an industrial based economy with a significant role of R&D activities conducted mainly for and by large enterprises. This tradition has been developed before the war conflict in the 90-ies, during the period of planning based economy active in the former Yugoslavia. Devastation caused by the war conflict and beginning of transition from planned to market oriented economy significantly affected country's system in general, but especially activities related to R&D. Once being the economy structured only from the large state-owned companies concentrated on manufacturing, Bosnia and Herzegovina faced the situation in which SMEs are starting to play an important role from the aspect of country's income, employment and development. The system of R&D, which was adjusted for the needs of large companies, now is facing a new reality - absence of their main target group and explosion of SMEs. In addition R&D institutions suffered from significant reduction of capacities for conducting R&D projects and services to companies, displayed through ruined premises, obsolete equipment, inexistence of special laboratories, knowledge and technology gap, administrative and legislative barriers.

National/Entity policies regarding R&D are based on a decentralised legal framework. Operative work regarding the implementation of R&D programs for SMEs is positioned on the Entity level of governance. Entity ministries are aware of the significance of R&D activities for economy, but having major obstacles in involvement of SMEs in this scope. Having in mind the fact large enterprises do not exist anymore as a prevailing factor of economy, National/Entity programs of support to R&D are in the phase of adjustment in accordance with the needs of SMEs. With the few exceptions, general notice for the Entity ministries responsible for science, technology and education is that they offer support to SMEs only indirectly, i.e. if SMEs are linked in consortium with R&D Institution (Universities and Institutes).

On the other hand, ministries responsible for industry, entrepreneurship and SMEs are interested to support R&D programs of SMEs and cooperation with R&D Institutions, but disappointed with the response. Reason for this situation could be found in the fact there programs are defined to support wide range of different activities, where SMEs choose to apply for getting support in more attractive ("popular") issues, usually oriented on the short term objectives. Tailoring of program exclusively for R&D issues of SMEs and R&D Institutions is crucial for achieving better results. Furthermore, the amount of financial support offered for contribution to projects of SMEs and R&D Institutions should be higher, since the existing ones are quite modest to attract SMEs.

Calls for submission of project proposals for programs of R&D are usually getting announced once a year, which is considered as non-flexible to the needs and activity dynamics of SMEs. Innovation active SMEs are not in position to ask for the support previous to the public announcement. This brings them in situation in which they have to wait for the call to start with their R&D project, instead of getting the support after the project is implemented or at least during the progress of implementation.

Dissemination activities and promotion in general is at the low level. Archives of programs are available on the web pages of program managing institutions partially or not at all. Reports on the actual impacts of R&D projects supported by programs in terms of employment, generation of income, raising of productivity and competitiveness are not available or not being written at all. Promotion of supported projects is raising awareness of public in general on the issue of R&D significance and opportunities offered to SMEs.

The majority of SMEs in Bosnia and Herzegovina have started their activities after the war conflict in 90-ies. Starting as small companies from the opportunities identified on the ruins of the previous system, they are in lack of capacities for implementing R&D projects, as well as the recognition and preparation of such project proposals. This makes one of the major obstacles faced by the SMEs in the process of application to announced public calls. More concentrated on the short term goals, SMEs choose programs and activities which could bring them fast benefits, rather then R&D opportunities important for their long term competitiveness. Adopting standards of Quality Management System and other production and administrative certificates were, and still is, one of the most popular activities demanded by the SMEs to be supported by the programs of Entity ministries. Additionally, missing of the dialogue with Universities and Institutes, determines their objectives and intentions towards the activities other then R&D.

4. Main findings on SMEs from MapEer SME

In order to assess SMEs needs and barriers in the scope of RTD activities within the MAPEER project, the project team have conducted a survey which included collection of MAPEER designed questionnaires (previously distributed to SMEs), in-depth (live) interviews with responsible representatives of SMEs, interviews with representatives of Business Associations/Clusters and official conclusions and recommendations of the National level Round table event (R + D + I support programmes for SMEs in BiH) organized on 22nd April 2010.
The following definition of RTD programme active and programme inactive SMEs along the MaPEeR SME methodology is used:
"SMEs are considered as active when they have been involved at least in one science-research project or programme during the last 5 years and they are considered as inactive in the field of science and research when they have not participated in any science and research project or programme".
First baseline for completing the survey were the MAPEER questionnaires collected from the total of 38 SMEs (20 RTD programme active/18 RTD programme inactive). Furthermore, 10 SMEs (5 RTD active/5 RTD inactive) from the examined sample were interviewed personally (in depth) in more detailed approach, in order to gain information, which can not be identified through the analysis of questionnaire forms.
Significant input for this report was gained through in depth interviews with representatives of 4 Business Associations/Clusters active in Bosnia and Herzegovina.
As one of the main dissemination activities of the project, a Round table event was organized in order to collect the views, opinions and recommendations of all stakeholders connected with performing of RTD activities for the benefit of SMEs in Bosnia and Herzegovina.

4.1 Overview of SME main information: respondents profiling

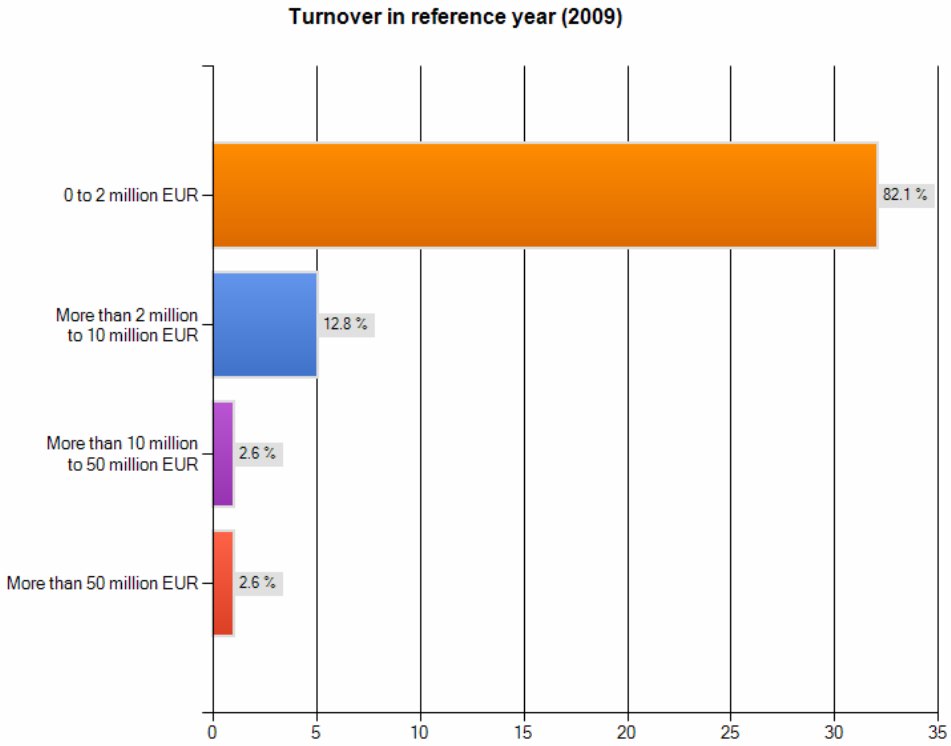
a. Main features of respondents

The survey is conducted in the period between 20th May and 1st September 2010.

Neither of the local SMEs is located in Technological park/area because of the fact that Bosnia and Herzegovina has no active organizations/institutions/capacities of that kind. However, there are active initiatives of local organizations and institutions aimed on establishing of such supporting capacities, but still in the initial stage of the process.
On the other hand, cluster initiatives are still rare, but existing. Only **7,7 %** of interviewed SMEs are actually integrated in one cluster/technology platform.
The year of establishment of interviewed SMEs varies from the year 1959 to 2009, with predominant percentage of SMS established in post-conflict period (after the year 1995) - approximately 71%.

Reference year of turnover for all interview SMEs is 2009.

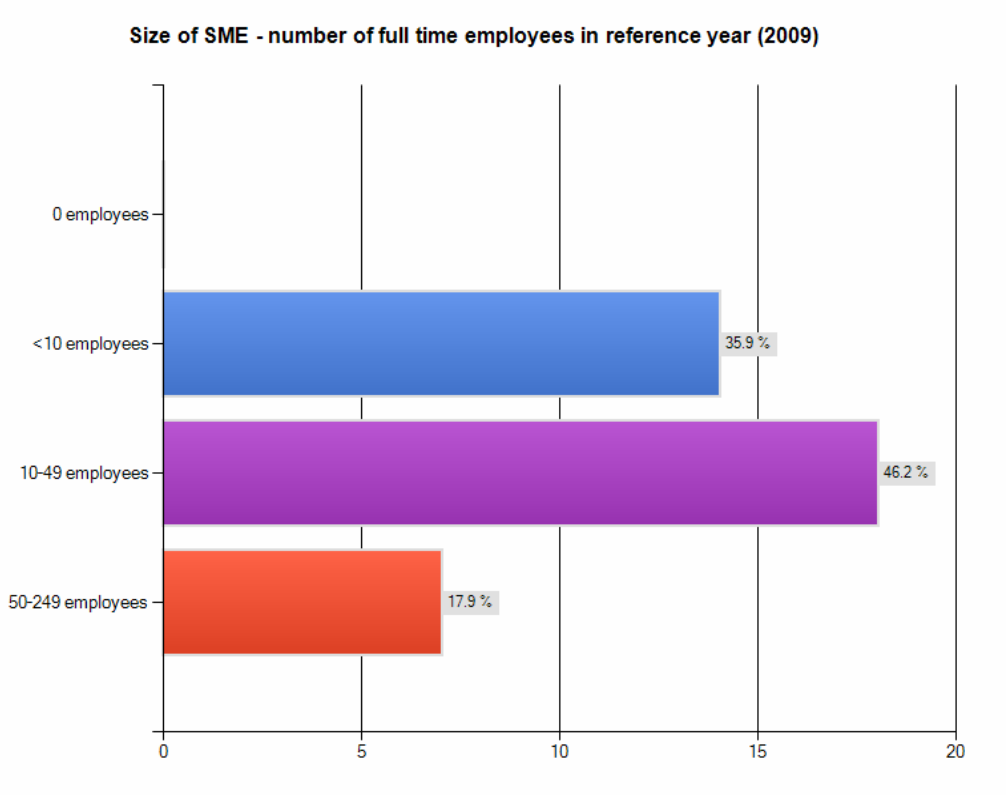
Figure 1. Turnover in reference year



Source: MAPEER Survey 2010

Analysing the values of turnovers in given reference years, 82.1% of interviewed SMEs are positioned in the range between 0 and 2 millions of EUR. 12.8% of interviewed SMEs are positioned in the range between 2 and 10 millions of EUR, while 2.6% are in the range between 10 and 50 millions of EUR, and in the range of more than 50 millions of EUR.

Figure 2. Size of SME (according to the number of employees)

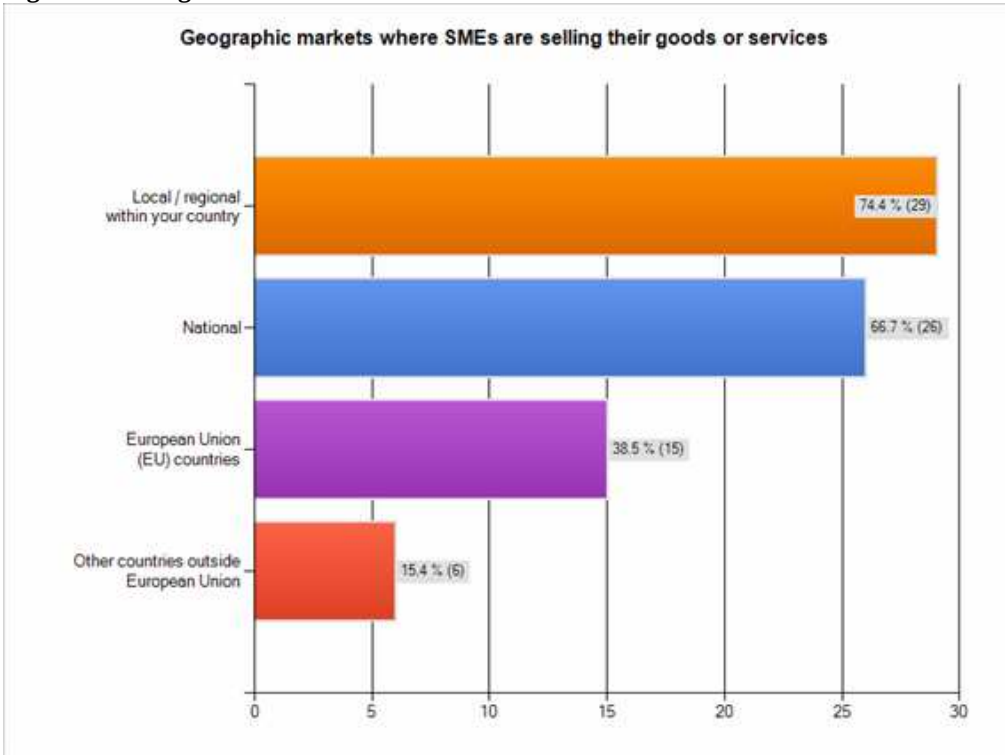


Source: MAPEER Survey 2010

When it comes to employment figures (full time employees - FTE), 46.2% of interviewed SMEs are employing 10 - 49 people, 35.9% are employing less then 10 people, and 17.9% are providing employment for 50 - 249 people.

The most frequent sector in which the interviewed SMEs are active is Other manufacturing (61.8%), followed by Metal (14.7%), ICT (8.8%), Construction (5.9%), Mechanical/Metallurgy (5.9%), Transport, Storage and Communications (2.9%), Environmental technologies (2.9%), Renewable energies (2.9%) and Electronics (2.9%).

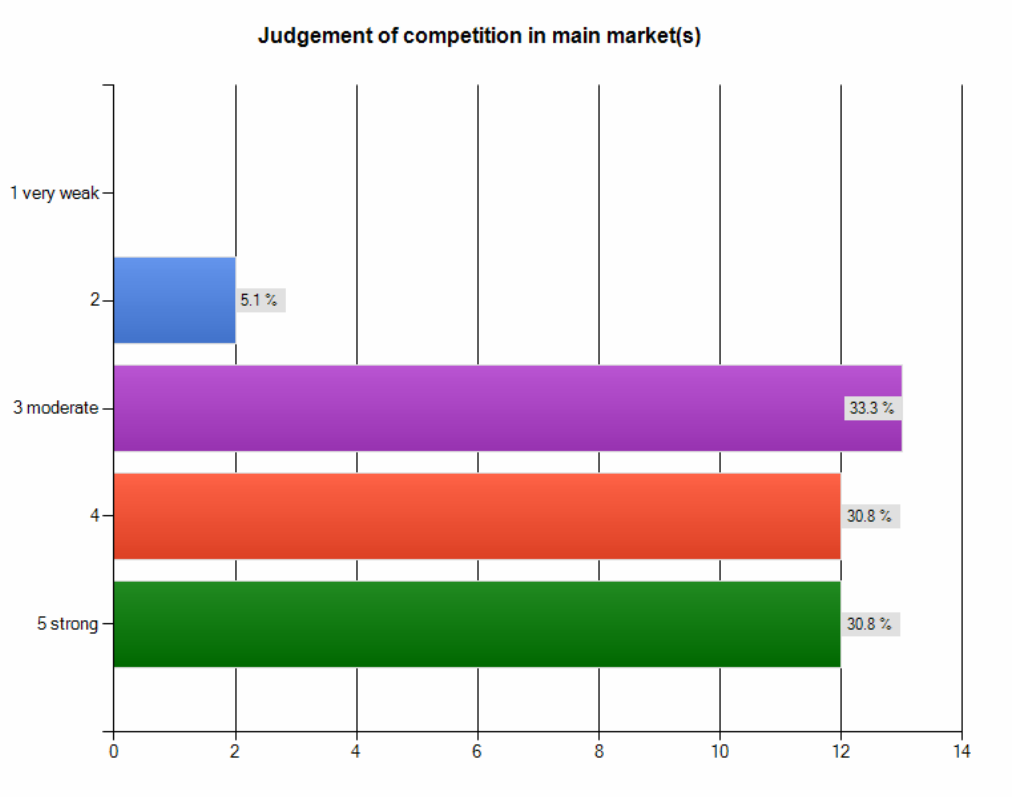
Figure 3. Strategic markets



Source: MAPEER Survey 2010

Main markets of interviewed SMEs are Local/Regional within the country (74.4%) or National (66.7%), while the orientation on the market of EU countries (38.5%) and countries outside of EU (15.4%) is less expressed.

Figure 4. Evaluation of competition



Source: MAPEER Survey 2010

Only 5.1% of interviewed SMEs are considering their competition as weak, while most of them are judging their competition from moderate (33.3%) to strong (30.8%) and very strong (30.8%).

4.2 Analysis of SME R&D&I capacity: active vs inactive comparison

b. Main SME RTD active/inactive groups identified

RTD income vs. RTD personnel

Table 4: Annual RTD income in % of total income vs. % of RTD full-time employees (RTD programme active SMEs) n=20

R&D personnel: % of full-time employees dedicated to R&D activities	Annual R&D income in % of total income: approximate percentage of total income coming from patents, licenses, royalties, demonstrators, proto-types etc.					
Answer Options	**0-10%**	**11-20%**	**21-50%**	**> 50%**	**Response Percent**	**Response Count**
0-10%	9	2	0	0	55,0%	11
11-20%	0	3	0	0	15,0%	3
21-50%	0	0	2	1	15,0%	3
> 50%	0	0	2	1	15,0%	3
Total	9	5	4	2		20

Source: MAPEER Survey 2010

Table 5: Annual RTD income in % of total income vs. % of RTD full-time employees (RTD programme inactive SMEs) n=18

R&D personnel: % of full-time employees dedicated to R&D activities	Annual R&D income in % of total income: approximate percentage of total income coming from patents, licenses, royalties, demonstrators, proto-types etc.					
Answer Options	**0-10%**	**11-20%**	**21-50%**	**> 50%**	**Response Percent**	**Response Count**
0-10%	13	0	0	0	72,2%	13
11-20%	0	2	0	0	11,1%	2
21-50%	0	0	1	0	5,6%	1
> 50%	0	0	0	2	11,1%	2
Total	13	2	1	2		18

Source: MAPEER Survey 2010

Majority of both RTD active and RTD inactive SMEs have an annual RTD income of up to 10% of total income and up to 10 % of full time employees dedicated to RTD activities. Analyzed relation on the survey sample shows the pattern between annual RTD income and RTD personnel. With the increase of the number of full time employees (FTE) devoted to RTD, the annual RTD income is also getting higher. Some major differences between RTD active and inactive SMEs can not be noticed, at least on the analyzed sample.

RTD income vs. annual RTD expenditures

Table 6: Annual RTD income in % of total income vs. Annual RTD expenditures in % of total expenditures (RTD programme active SMEs) n=20

Annual R&D expenditures in % of total expenditure: approximate percentage of total expenditures allocated to R&D expenses (R&D staff salaries, contracts to outside R&D performers, acquisition of machinery, equipment and software, purchase of patents and know-how from other organizations, training in R&D, market introduction of innovations)	**Annual R&D income in % of total income: approximate percentage of total income coming from patents, licenses, royalties, demonstrators, proto-types etc.**					
Answer Options	**0-10%**	**11-20%**	**21-50%**	**> 50%**	**Response Percent**	**Response Count**
0-10%	6	3	0	0	45,0%	9
11-20%	3	2	1	0	30,0%	6
21-50%	0	0	2	1	15,0%	3
> 50%	0	0	1	1	10,0%	2
Total	9	5	4	2		20

Source: MAPEER Survey 2010

Table 7: Annual RTD income in % of total income vs. Annual RTD expenditures in % of total expenditures (RTD programme inactive SMEs) n=18

Annual R&D expenditures in % of total expenditure: approximate percentage of total expenditures allocated to R&D expenses (R&D staff salaries, contracts to outside R&D performers, acquisition of machinery, equipment and software, purchase of patents and know-how from other organizations, training in R&D, market introduction of innovations)	**Annual R&D income in % of total income: approximate percentage of total income coming from patents, licenses, royalties, demonstrators, proto-types etc.**					
Answer Options	**0-10%**	**11-20%**	**21-50%**	**> 50%**	**Response Percent**	**Response Count**
0-10%	10	0	0	0	55,6%	10
11-20%	1	1	1	0	16,7%	3
21-50%	2	1	0	1	22,2%	4
> 50%	0	0	0	1	5,6%	1
Total	13	2	1	2		18

Source: MAPEER Survey 2010

Majority of interviewed SMEs (45% of RTD active and 55,6% of RTD inactive) are spending up to 10 % of their annual expenditures on R&D activities. Analyzed data show slightly higher rate of success measured by R&D income by RTD active SMEs, where 33,3% of RTD active SMEs achieves R&D income in the range between 11-20% of their total annual income, with the expenditure of up to 10% of total annual expenditure. RTD programme inactive SMEs with the same range of total annual expenditure (up to 10%), do not exceed 10% of annual income coming from R&D.

Current sales vs. jobs created or sustained

Table 8: Proportion of current sales from new or substantially improved products or processes introduced since 2005 vs. job positions created or sustained as a result of introducing new or substantially improved products or processes since 2005 (RTD programme active SMEs) n=20

What proportion of your current sales comes from new or substantially improved products or processes introduced since 2005?	How many job positions have been created or sustained in your company as a result of introducing new or substantially improved products or processes since 2005?						
Answer Options	**0-5 jobs**	**6-10 jobs**	**11-20 jobs**	**21-30 jobs**	**31-40 jobs**	**Response Percent**	**Response Count**
0-10%	3	1	0	0	0	21,1%	4
11-20%	3	0	0	1	0	21,1%	4
21-30%	1	0	0	0	0	5,3%	1
31-40%	0	1	0	1	0	10,5%	2
41-50%	0	2	0	0	0	10,5%	2
> 50%	3	2	1	0	0	31,6%	6
						answered question	**19**
						skipped question	**1**

Source: MAPEER Survey 2010

Table 9: Proportion of current sales from new or substantially improved products or processes introduced since 2005 vs. job positions created or sustained as a result of introducing new or substantially improved products or processes since 2005 (RTD programme inactive SMEs) n=18

What proportion of your current sales comes from new or substantially improved products or processes introduced since 2005?	How many job positions have been created or sustained in your company as a result of introducing new or substantially improved products or processes since 2005?						
Answer Options	**0-5 jobs**	**6-10 jobs**	**11-20 jobs**	**21-30 jobs**	**31-40 jobs**	**Response Percent**	**Response Count**
0-10%	5	1	0	0	0	33,3%	6
11-20%	0	0	0	0	0	0,0%	0
21-30%	2	1	2	0	0	27,8%	5
31-40%	0	0	0	0	0	0,0%	0
41-50%	0	0	1	0	0	5,6%	1
> 50%	2	2	0	0	2	33,3%	6
						answered question	**18**
						skipped question	**0**

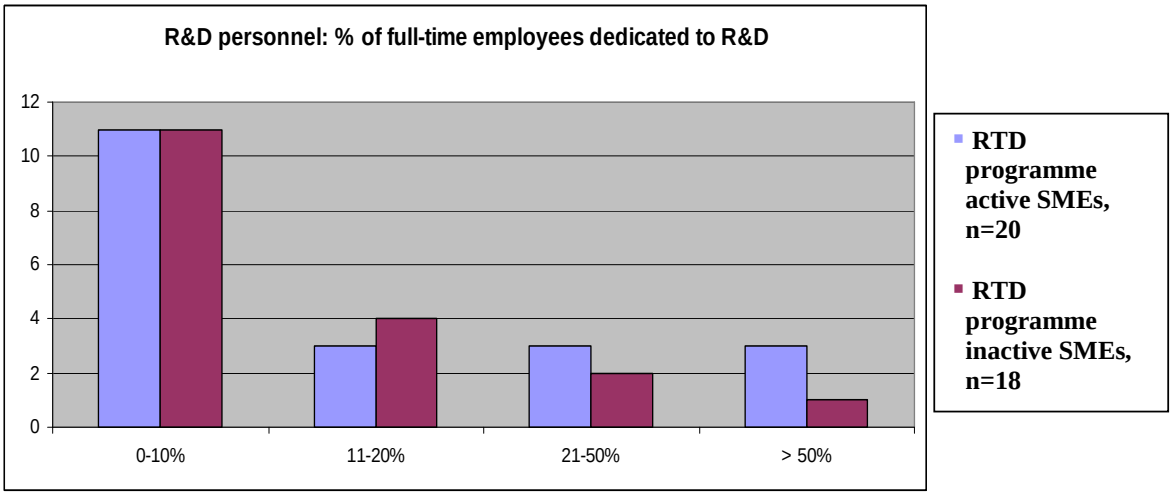
Source: MAPEER Survey 2010

Proportion of sales coming from new or improved products is higher than 21% for 57,8% of RTD active SMEs, and 66,6% of RTD inactive SMEs. Proportion of sales coming from new or improved products is exceeding 50% of current sales in more than 30% of SMEs (31,6 % of RTD active and 33,3 % of RTD inactive). Most frequent answer on the number of new job positions is up to 5 (equal or over 50 % of cases, both in RTD active and RTD inactive SMEs).

Cross analysis (sales vs. jobs created) are no showing any differences between RTD programme active and RTD programme inactive SMEs.

FTE of RTD programme active/inactive SMEs dedicated to RTD

Figure 5: % of full-time employees dedicated to RTD activities

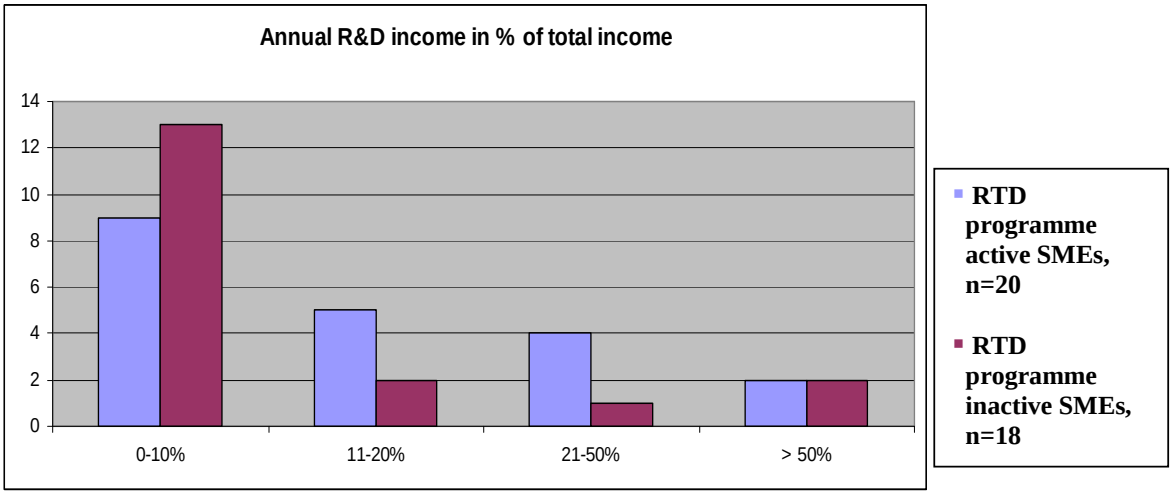


Source: MAPEER Survey 2010

Presence of R&D personnel shows no significant differences between RTD programme active and RTD programme inactive SMEs. Most of the interviewed SMEs (equal or more than 50% of them) have up to 10 % of FTE dedicated to RTD.

Annual RTD income of RTD programme active/inactive SMEs of total income

Figure 6: Annual RTD income in % of total income

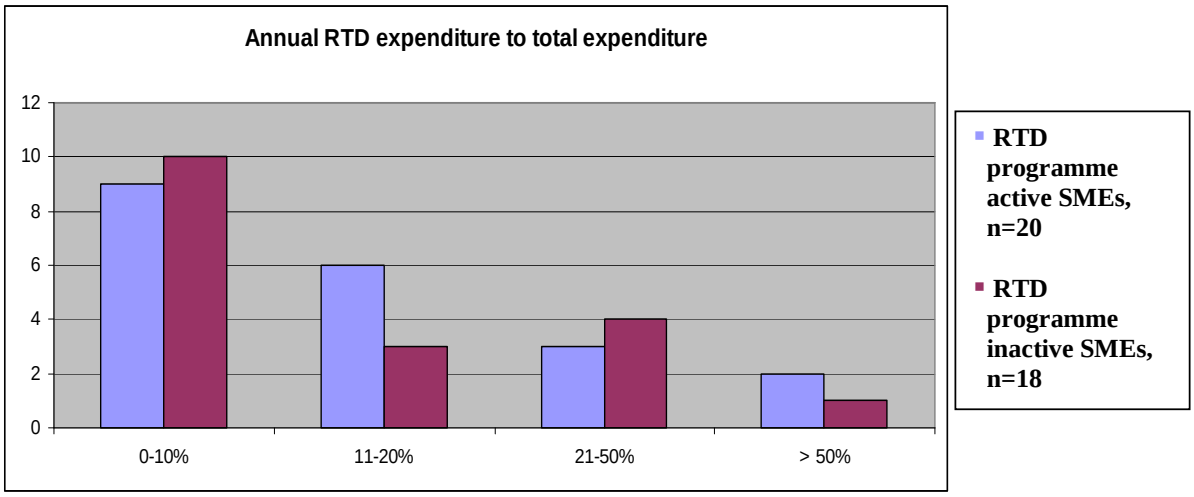


Source: MAPEER Survey 2010

Only 10% of RTD programme active SMEs have more then 50% of their income coming from R&D, while the percentage of RTD programme inactive SMEs is just slightly higher (11,11%).

Annual RTD expenditure of total expenditure (RTD programme active and inactive SMEs)

Figure 7: Annual RTD expenditures in % of total expenditures

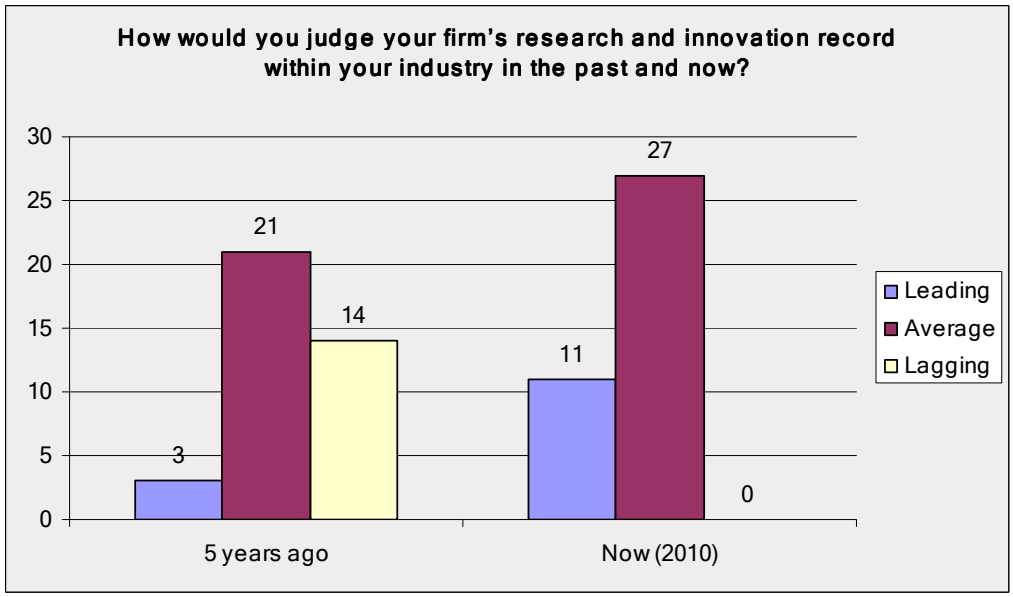


Source: MAPEER Survey 2010

Exactly 50% of both RTD programme active and RTD programme inactive SMEs have R&D expenditure in the percentage which does not exceeds 10% of total annual expenditure.

Innovation capacity

Figure 8: Research and innovation record of SMEs in their sectors in 2005 and 2010 (n=38)



Source: MAPEER Survey 2010

When it comes to the innovation capacities of SMEs, interviewed representatives of SMEs stated that their research and innovation record is improved in the period of last 5 years. In this moment almost 29% of SME claim they have a leading research and innovation record in their industrial branch, while 71% claim they are on average. Major progress is recorded in the sense that there was not a single SME which claimed it is lagging with their research and innovation record. Comparing it with the situation five years ago, only 11% of SMEs claimed they are leading, 53% claimed they are on the average and 36% they are lagging with their research and innovation record within their industry.

The global crises left its impact on sales of new (or improved) and established products of SMEs. Only 15 % of RTD active SMEs had actually good impact on sales of new (or improved) products. Neutral impact of crises had 45%, while 40% claimed bed impact on sales of new (improved) products. On the other hand, the order of percentages for this issue for RTD inactive SMEs was: 22% - good impact, 44% - neutral impact and 33% - bad impact. The impact of global crises on sales of already established products has no significant differences compared to new (or improved) products, both for RTD active and RTD inactive SMEs.

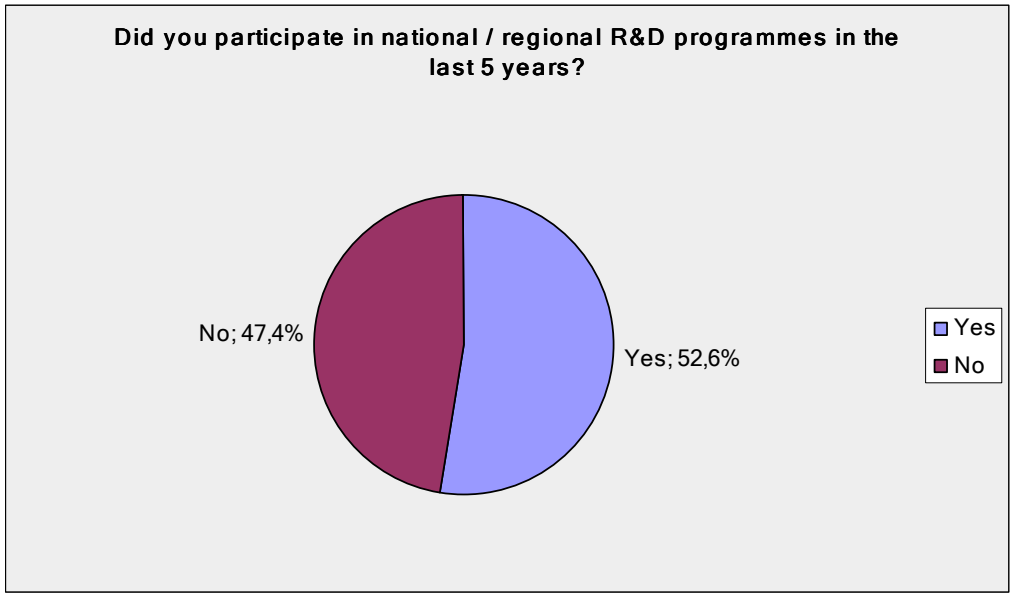
4.3 Track record of SME participation in R&D&I programmes

c. Profile of respondents in relation to their track record in programmes

In tracking the record of SME participation in R&D&I programmes, it is important to stress that SMEs from Bosnia and Herzegovina rarely participated in any of EU funded R&D programmes. Some programs (including Framework Programme, COST and EUREKA) became available at the end of 2008 and beginning of 2009. Therefore, participation of local SMEs in EU funded R&D programmes was very rare (only 2 local SMEs from the sample actually participated). In other words, local SMEs participated predominantly on programmes announced by the state institutions and international organizations active in Bosnia and Herzegovina.

It is also important to notice that due to a very small number of existing RTD programmes for SMEs (only 5 of them are mapped) in Bosnia and Herzegovina, some question in the survey could not be applied for local SMEs. For example, since the local SMEs have participated only in one national/regional RTD programme, comparison of participation experiences with other active programmes can not be conducted (SMEs can not compare their experiences from participation in RTD programmes, if they have actually participated in only one programme). Participation of SMEs on more than one RTD programme is not registered. Nevertheless,

Figure 9: Participation in national/regional and/or EU RTD programmes in the last 5 years (n=38)



Source: MAPEER Survey 2010

Programme participation of RTD programme active SMEs

Table 10: Breakdown by different national/regional RTD programmes SMEs have participated in (n=20)

Programme	SME frequency (within the survey sample)	%
Program podsticaja uvođenju inovacija i novih tehnologija u MSP	11	55
Transfer za poticaj razvoja poduzetništva i obrta - Podprogram Stvaranje inovativne ekonomije	6	30
Program podrške naučno-istraživačkim projektima u FBiH, Podprogram Podrška naučno istraživačkim projektima od značaja za Federaciju BiH	0	0
Program osnovnih, primjenjenih i razvojnih istraživanja u RS	0	0
Program Excellence in Innovation	3	15
TOTAL	**20**	**100**

Source: MAPEER Survey 2010

d. Innovation paths of SME respondents

The respondents assigned a rank on the agreement 1-5 (5 representing highest agreement on statement) related to statements about the innovation process.

Table 11: Innovation Statements (n=38)

Innovation statements	RTD programme active SME (Average) n=20	RTD programme inactive SME (Average) n=18
I am satisfied that my innovation needs are met by internal R&D.	3,30	3,35
When I bring in or jointly develop an outside technology, it is to address an incremental product development.	3,61	3,89
When I bring in or jointly develop an outside technology, it is to address a breakthrough product.	4,00	4,00
I typically work with 'well known, mature technologies used in other applications, too.	3,31	3,83
I typically try to develop something entirely new.	3,47	3,59
When something is developed internally that doesn't fit with my business model, we have a practice of selling IP or letting the idea into the market place.	2,82	2,80
When something that was initially developed internally is deemed 'dead', efforts are made to find companies or partners that might be interested in it.	2,64	2,80

Source: MAPEER Survey (2010)

Average marks on innovation statements of SMEs shows only negligible differences between RTD active and RTD inactive. Statements which could be considered as indicative are the ones regarding IP rights, selling of idea on the market, and finding companies or partners that might be interested in it. Representatives of companies do not agree with the statement on not putting any additional efforts for projects deemed as "dead" and looking for partners or companies that might be interested in it.

RTD&I strategy

In MAPEER survey, innovation capacity of SMEs is also analyzed through questions on the existence of in-house research and innovation department within companies, as well as the existence of strategic framework (RTD&I Strategy) for future period. Within RTD active SMEs, 54% has a separate (in-house) department for research and development, while those figures for RTD programme inactive SMEs is significantly lower - 20%. Similar situation is with RTD&I Strategy. Survey has shown that 40% of RTD programme active SMEs actually has a strategy for RTD&I for the period of next five years. This figure for RTD programme inactive SMEs is just 28%.

In the Table 12. the respondents assigned a rank on the agreement 1-5 (5 representing highest agreement on statement) related to statements about the approach towards acquiring external knowledge.

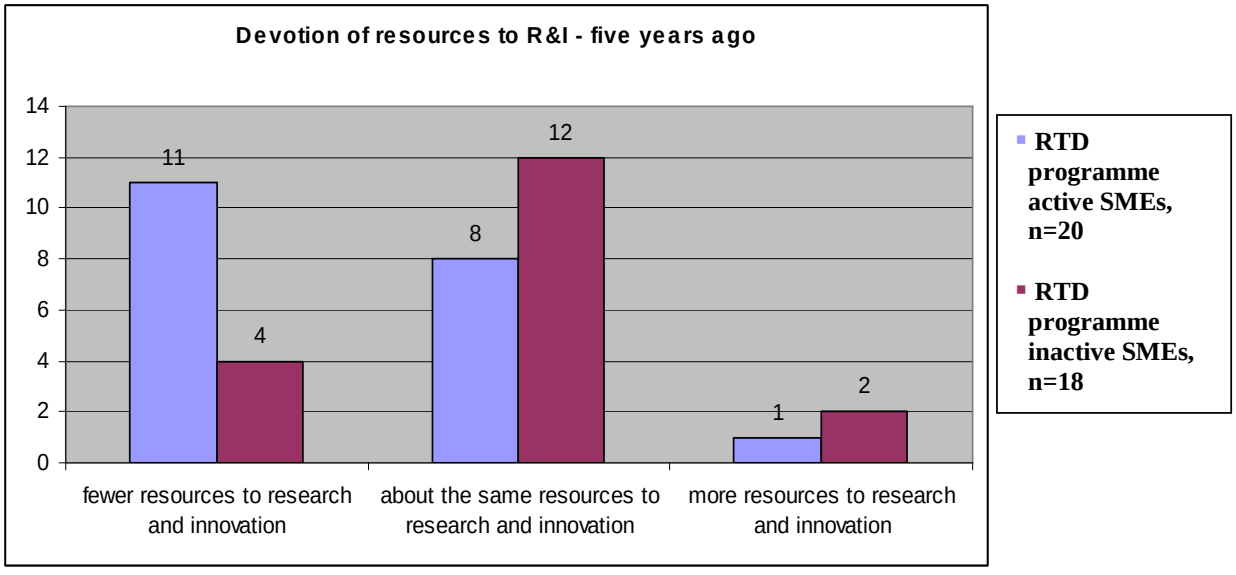
Table 12: Approach towards acquiring external knowledge

	RTD programme active SME (Average) n=20	RTD programme inactive SME (Average) n=18
Use an online technology or knowledge broker/intermediary	3,63	3,17
Informal networking with other firms	3,95	3,06
Informal networking with research organizations	3,06	2,41
Strategic alliances with other firms	3,36	3,35
Non-equity alliance with other firms	3,17	2,40
Participation in innovation networks, S&T parks, clusters, etc.	3,82	2,07
Close involvement of end users/customers in idea generation/concept development	3,92	2,87

Source: MAPEER Survey 2010

As shown in table 12. in the approach towards acquiring external knowledge, RTD programme active SMEs have a slightly or significantly higher average marks compared to RTD programme inactive SMEs. One of the most indicative results is the fact that RTD programmed active SMEs are more ready to cooperate with other firms rather than research organizations.
Furthermore, RTD programme active SMEs are more interested for innovation networks, cluster memberships and S&T parks. On the other hand, and for the same issue, RTD programme inactive SMEs have low interest for networking in general.

Figure 10: Devoting of resources to research and innovation, five years ago

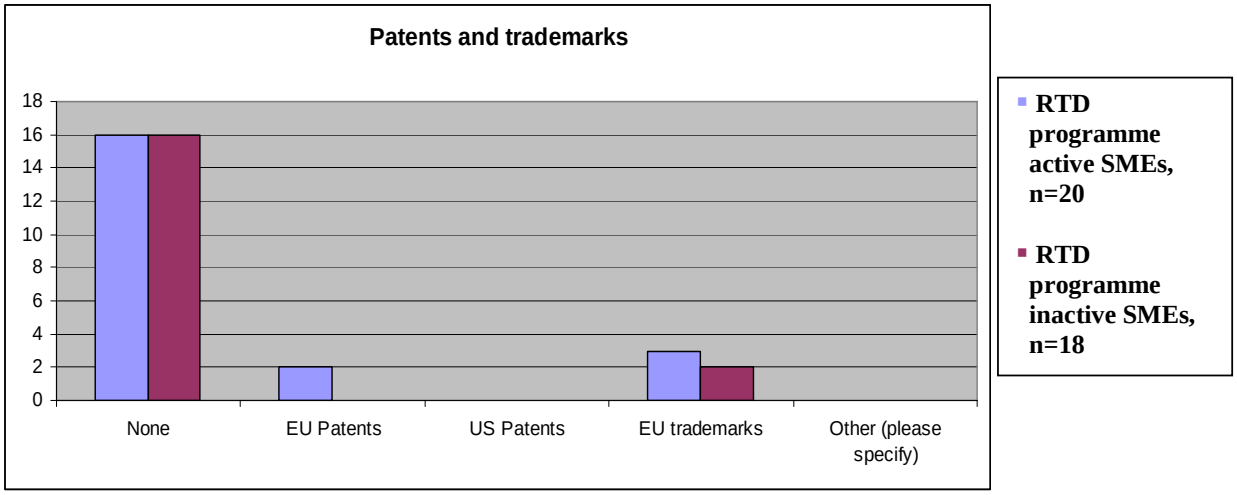


Source: MAPEER Survey 2010

Compared to the period of five years ago, 55 % of RTD active SMEs are investing more resources in research and innovation, while 40 % are investing the same resources. On the other side, 22 % of RTD

inactive SMEs are investing more resources for research and innovation, while 66 % are investing same amount of resources.

Figure 11: Patents and Trademarks



Source: MAPEER Survey 2010

Ownership of patents and trademarks are still rare for RTD programme active, as well as RTD programme inactive SMEs in Bosnia and Herzegovina.

4.4 Perceived benefits and problems, specific needs and main barriers

e. Perceived benefits and problems

Benefit of national/regional RTD programmes for RTD programme active SMEs
The RTD programme active SMEs assigned a rank of importance from 1-5 (5 representing highest importance of indicator) related to questions about the perceived benefits. Values higher than 3,5 are seen as important and values lower than 2,5 are seen as not important. Values between 2,5 and 3,5 stand for a more or less neutral position.
Since the interviewed SMEs had only one appearance as participants in RTD programmes, their experiences in terms of benefits can be concluded only with that particular fact in mind.

Table 13: General main beneficial impacts in from participating in national/regional RTD Programmes

Benefits	Average mark
Knowledge benefits	
Enhanced in-house knowledge and competences	3,47
Enhanced ability to manage R&D resources	3,14
Establishment of in-house critical mass of R&D	2,71
Improved access to complementary expertise	3,12
Networking benefits	
Formation of new partnerships and networks	3,39
Improved R&D linkages with universities and research institutes	3,00
Improved R&D linkages with other business organisations	3,33
Improved commercial linkages with other organisations	3,00
Reputation benefits	
Enhanced reputation and image	3,85
Facilitated participation in other national/intern. R&D programs	3,10
Economic benefits	
Improved competitive position	3,63
Increased turnover	3,55
Increased profitability	3,73
Enhanced productivity	4,25
Production or delivery of proto-types	3,75
Production or delivery of new products, processes or services	3,88
Improved market share	3,44
Access to new markets	3,60
Improved employment levels	3,44
Application / granting of patents	2,38
Internationalisation benefits	
International networking / cooperation with research actors	2,78
International networking / cooperation with other firms	3,09
Access to international markets	3,50
Internationalisation of activities	3,21

Source: MAPEER Survey 2010

Analysis of the above stated statement and average marks given by RTD active SMEs, it can be concluded that main beneficial impact from participating in the national/regional RTD programmes are in economic benefits. Stated as most important is enhanced productivity, followed by production

or delivery of new products, processes or services, production or delivery of proto-types, increased profitability, access to new markets, etc. It is interesting that enhanced reputation and image of SMEs has been considered also as significant benefit.

f. Reasons for not participating

Interviewed SMEs assigned a rank of importance from 1-5 (5 representing highest importance of indicator) related to questions about the perceived benefits. Values higher than 3,5 are seen as important and values lower than 2,5 are seen as not important. Values between 2,5 and 3,5 stand for a more or less neutral position.

Table 14: General reasons for not participating in national/regional and EU RTD Programmes

Barriers	Average national/regional RTD programme	Average EU RTD programme
Administrative barriers:		
Bureaucratical / non-affordable application procedure	3,75	3,64
Long time-to-contract periods	3,48	3,40
Long time-to-funding periods	3,62	3,40
Long proposal evaluation periods	3,41	3,89
Not transparent proposal evaluation procedures	3,55	3,10
Complex reporting requirements	3,55	3,60
Financial barriers:		
Low funding rates	4,04	2,67
Inability to get loans, provide bank guarantees, etc.	3,89	4,00
Unavailability of additional sources of finance	3,58	4,22
SME-internal barriers		
Limited in-house knowledge on project management	3,36	3,44
Limited networks/links with potential partners	2,88	2,75
Irrelevance of programme aims to SME's interests	3,15	2,71
Not perceived need to participate in R&D programmes	3,43	3,00
External barriers		
Limited marketing/information about programme(s)	3,65	3,83
Limited / lack of assistance / guidance from programme officers	3,60	4,25
Inappropriate technological conditions	3,50	3,71
Inappropriate market conditions	3,57	3,00
Inappropriate general economic conditions	3,54	3,20

Source: MAPEER Survey 2010

Analyzing the reasons (barriers) for not participating in RTD programmes, it is interesting that SMEs consider low funding rates as the main reason (barrier) for national/regional programmes, while for EU RTD programmes this reason in considered as the least one. Inability to get loans and unavailability of additional resources of finances are also considered as most important. Furthermore, in external barriers, limited assistance and guidance of programme officers is considered as the most important for not participating in EU RTD programmes.

g. Specific needs of SMEs in participating in RTD support programmes

Main needs for SMEs

Interviewed SMEs assigned a rank of importance from 1-5 (5 representing highest importance of indicator) related to questions about the perceived benefits. Values higher than 3,5 are seen as important and values lower than 2,5 are seen as not important. Values between 2,5 and 3,5 stand for a more or less neutral position.

Table 15: General main needs for SMEs to participate in RTD programmes

Needs of SMEs	RTD programme active SMEs (average)	RTD programme inactive SMEs (average)
Administrative needs:		
Simple application procedures	3,47	4,17
Short time-to-contract periods	3,29	4,06
Short time-to-funding periods	3,29	4,06
Short proposal evaluation periods	3,17	3,94
Transparent proposal evaluation procedures	3,41	3,94
Adequate assistance / guidance during project by Project officer	3,47	3,88
Simple reporting requirements	3,44	3,87
Financial needs:		
High funding rates	3,20	3,53
Limited requirements to get loans, provide bank guarantees, etc.	3,20	3,47
Availability of additional financing opportunities	3,20	3,47
SME-internal needs:		
Adequate in-house knowledge on project management	3,20	3,33
Adequate networks of potential partners	3,40	3,73
Compliancy of programme aims to SME's interests	3,60	3,93
Easy access to information about available programmes	3,60	3,73
Strong acknowledgement of need to participate in R&D programmes	3,20	3,67
External needs:		
Adequate marketing of /information about programme(s)	3,20	3,86
Adequate external assistance / guidance during project	3,40	3,79
Adequate external assistance / guidance after project (exploitation)	3,20	3,79
Appropriate technological conditions	3,40	3,60
Appropriate market conditions	3,60	3,87
Appropriate general economic conditions	3,20	3,67

Source: MAPEER Survey 2010

Data from table no. 15 confirm that RTD programme inactive SMEs are expressing more "sensitivity" in expressing their needs in terms of RTD programmes. Each grade given by RTD programme inactive SME on certain need, is higher than each grade given by RTD programme active SMEs.

Comparison of needs satisfied by national/regional RTD programmes vs. EC RTD programmes (Framework Programme, FP)

Since local SMEs did not participate in any Framework Programme funded project, comparison of satisfied needs can not be conducted.

h. Main barriers for needs of SMEs in undertaking RTD activities

Interviewed SMEs assigned a rank of importance from 1-5 (5 representing highest importance of indicator) related to questions about the perceived benefits. Values higher than 3,5 are seen as important and values lower than 2,5 are seen as not important. Values between 2,5 and 3,5 stand for a more or less neutral position.

Table 16: Main barriers faced by SMEs in undertaking RTD and innovation activities

Barriers for SMEs in undertaking R&D	RTD programme active SMEs (average)	RTD programme inactive SMEs (average)
Knowledge barriers:		
Lack of in-house qualified personnel	3,55	3,61
Lack of internal R&D and innovation management capabilities	3,61	3,76
Lack of internal R&D exploitation capabilities	3,59	3,88
Lack of access to external knowledge (like universities, R&D institutions etc.)	3,63	3,88
Limited knowledge about the advantages of R&D and innovation	3,44	3,65
Lack of information on technologies or markets	3,25	3,06
Financial barriers:		
Lack of in-house funds	3,60	3,29
Lack of access to external financing sources	3,20	3,64
Innovation costs too high	3,20	3,50
Programme related barriers:		
Lack of access to information on R&D /innovation support programmes	2,60	3,57
Difficulties related to programme procedures / requirements	3,40	3,64
Problems with IPR protection	3,20	3,21
External barriers:		
Difficulties in finding cooperation partners	2,60	3,36
Uncertain / limited demand for innovative goods or services in relevant markets	3,40	3,62
Insufficient integration of SMEs in the relevant policy-making	3,60	3,38

Source: MAPEER Survey 2010

In barriers for SMEs in undertaking R&D, highest significance has a group of knowledge barriers (lack of qualified in-house personnel, R&D and innovation management capabilities, lack of internal R&D exploitation capabilities, lack of access to external knowledge and limited knowledge about the advantages of R&D and innovation). It also important to mention external barriers, where local SMEs are facing barriers in finding cooperation partners for EU RTD programmes, and where SMEs consider themselves as insufficiently integrated in the relevant policy making for national/regional RTD programmes.

4.5 Identification of good and bad practices

i. Good and bad practice programmes

As already mentioned in the previous chapters of this report, the number of RTD programmes for SMEs in Bosnia and Herzegovina was very low. This caused the fact instead of six (6) RTD programmes, only five (5) of them are actually analyzed and included in **National Report on SME R&D&I Programmes and Initiatives in Bosnia and Herzegovina (MAPEER WP2)** and this report. In this situation, comparison of good and bad practice RTD programmes for SMEs in Bosnia and Herzegovina can not be justified. In general lack of resources and RTD programmes (analysed in detail in WP2 - National Report for BiH), a single programme for RTD for SMEs can not be marked as bad practice. This situation is reflected on the opinions of RTD programme active SMEs expressed in the survey, so there were not any cases of appointing bad practice programmes.

4.6 Future expectations / recommendations

j. Future expectations / recommendations

Recommendations from SMEs

Interviewed SMEs assigned a rank of importance from 1-5 (5 representing highest importance of indicator) related to questions about the perceived benefits. Values higher than 3,5 are seen as important and values lower than 2,5 are seen as not important. Values between 2,5 and 3,5 stand for a more or less neutral position.

Table 17: Future expectations of SMEs

Future expectations of SMEs	R&D Active SMEs (Average mark)	R&D Inactive SMEs (Average mark)
Develop measures to support access to market and faster commercialization of R&D results	4,11	4,41
Create / increase tax incentives for SMEs that develop R&D activities	3,95	4,39
Improve promotion about R&D programmes so that SMEs better understand their benefits	4,15	4,28
Improving in-house knowledge / relevant expertise	4,24	4,21
Lowering barriers on access to external knowledge	4,06	4,00

Lowering barriers on access to external funds / financing	4,00	4,20
Lowering barriers on access to market / R&D programme information	4,00	4,00
Improving networking between SMEs and research partners	3,94	4,13
Simplifying participation in relevant R&D programmes	3,81	4,00
Improving IPR protection rules	3,42	3,83
Integrating SMEs in relevant national / regional policy-making	4,42	4,18
Promoting open innovation (This type of innovation implies that companies may be able to buy or license processes or inventions from other companies and/or R&D organizations (incl. contract research); or that the innovation processes may be taken outside of a company sector through forms licensing, joint ventures, spin-offs and other collaborative mechanisms.)	4,00	3,83

Source: MAPEER Survey 2010

Special attention of interviewed SMEs was expressed in expressing there expectations on the future practices and planning of RTD programmes by national/regional and EU authorities. RTD active SMEs strongly underlined their expectation to be integrated in relevant national/regional policy-making (4,42 - highest average mark given). Another important point given by RTD active SMEs is their expectation of contents (programmes and projects) aimed on in-house capacity building for research and innovation. RTD inactive SMEs, on the other hand, have highest expectation regarding the development of measures to support access to market and faster commercialization of R&D results, followed by the improvement of promotion about R&D programmes so that SMEs better understand their benefits, lowering barriers on access to external funds / financing, etc.

Recommendations from SME stakeholders

In order to analyse relation between SMEs and RTD activities from the stakeholders perspective, four (4) business associations/clusters have been interviewed. Their representatives answered on the series of questions (template 3.3 - Interview Template for SME associations and clusters). Following statements have been evaluated in order to identify priorities for future initiatives and actions. (Statements are marked from 1 to 5, where 1 = not important, …, 5 = most important)

Table 18: Reasons for not participating in R&D programmes (SME stakeholders view)

Reasons for not participating in R&D programmes	National/regional RTD programmes	International RTD programmes
Bureacratical / non-affordable application procedure	3,25	4,25
Long time-to-contract periods	2,00	2,50
Long application-to-funding periods	2,50	2,75
Low funding rates	3,50	4,00
Inability to get loans, provide bank guarantees, etc.	3,00	3,75
Limited other financing opportunities	3,75	4,00
Limited marketing of programme(s)	2,75	2,75
Limited in-house knowledge on project management	2,75	3,25
Limited networks of potential partners	3,50	3,50

Irrelevance of programme aims to SME's interests	3,50	3,75
Complex reporting requirements	2,50	3,25
Unavailability of support during project	3,50	3,50
Unavailability of support after project (exploitation)	3,50	3,50

Source: MAPEER Survey 2010

Table 19: Main problems/barriers faced by the sector in undertaking R&D and innovation activities (SME stakeholders view)

Main problems/barriers faced by the sector in undertaking R&D and innovation activities	Average mark
Lack of in-house qualified personnel	3,75
Lack of internal R&D and innovation management capabilities	3,50
Lack of access to external knowledge (like universities, R&D institutions etc.)	3,00
Lack of in-house funds	4,50
Lack of access to external financing sources	4,50
Innovation costs too high	3,75
Limited knowledge about the advantages of R&D and innovation	3,50
Lack of information on technologies or markets	4,00
Uncertain / limited demand for innovative goods or services in relevant markets	3,50
Lack of access to information on R&D /innovation support programmes	3,50
Difficulties in finding cooperation partners	4,00
Difficulties related to programme procedures / requirements	4,25
Problems with IPR protection	3,75
Insufficient integration of SMEs in the relevant policy-making	4,50

Source: MAPEER Survey 2010

Table 20: Future expectations/recommendations of SMEs (SME stakeholders view)

Future expectations/recommendations	Average mark
Improving in-house knowledge / relevant expertise	4,50
Lowering barriers on access to external knowledge	4,25
Lowering barriers on access to external funds / financing	4,75
Lowering barriers on access to market / R&D programme information	4,50
Improving networking between SMEs and research partners	4,75
Simplifying participation in relevant R&D programmes	4,75
Improving IPR protection rules	4,50
Integrating SMEs in relevant national / regional policy-making	4,75
Promoting open innovation	3,75

Source: MAPEER Survey 2010

As a result of Round table event organized in April 2010 and which have gathered major relevant representatives of institutions and organizations considered as main stakeholders, a set of following conclusions is adopted:

1. RTD projects of SMEs should be one of the basic elements of SME development in the future.
2. All responsible ministries and institutions should start working on the task of setting up the operational system of functional cooperation between SMEs and Science and Research organizations and institutions (Universities and Institutes).
3. Improve intermediary role of chambers, agencies, associations/clusters in establishing of cooperation links between SMEs and Science and Research organizations and institutions (Universities and Institutes).
4. Strengthening of capacities for providing of services to SMEs, primarily through establishing of accredited laboratories.
5. Utilization of databases and infrastructure of Chambers of Commerce and Business Associations/Clusters for identification of SME needs in RTD.
6. Promote opportunities for SMEs given by EU Framework Programme and other EU RTD programmes.

5. Main conclusions

Conclusions of the survey are made on the bases of analysis section and in-depth interviews conducted with representatives of SME associations/clusters and other stakeholders. Conclusions are also reflecting opinions and views of MAPEER project team of Agency PREDA in terms of actual RTD environment for SMEs in Bosnia and Herzegovina.

a. SME profile per country

In the table 21. below are the main characteristics for RTD programme active and programme inactive SMEs that can be stated from the MaPEeR SME study.

Table 21: SME profile - Bosnia and Herzegovina

	RTD programme active SMEs	RTD programme inactive SMEs
Located in technology park	0%	0%
Integrated in cluster/technology platform	0%	16,70%
Year of foundation	60 % are older than 10 years	33 % are older than 10 years
FTE dedicated to RTD activities	55 % of SMEs has dedicated 0-10% of FTE for RTD	61 % of SMEs has dedicated 0-10% of FTE for RTD
Annual RTD expenditure to total expenditure	45 % of SMEs has RTD expenditure of 0 - 10 % of total annual expenditures	55 % of SMEs has RTD expenditure of 0 - 10 % of total annual expenditures
RTD income in relation to total income	45 % of SMEs has 0 - 10 % of total inome coming from RTD activities	72 % of SMEs has 0 - 10 % of total inome coming from RTD activities
Competition	Moderate competition environment	Strong competition environment
Internationalization	Weak (local/regional market orientation)	Weak (local/regional market orientation)
Current sales from new or substiantially improved products/processes	30% of RTD active SMEs have more than 50% of current sales coming from new or substantially improved products /processes	33% of RTD active SMEs have more than 50% of current sales coming from new or substantially improved products /processes
Job creation/sustainment	up to 5 job positions	up to 5 job positions
Own RTD department	35%	16,70%
Patents	0 % has patents	0 % has patents
RTD and innovation strategy defined	40%	22%
Development of totally new products/processes	65%	48%
Satisified with internal RTD	35%	35%
Devotion on more resources on RTD&I	55 % devote more resources	22 % devote more resources

Source: MAPEER Survey 2010

b. SME needs and barriers main findings regarding the involvement in R&D&i activities

During conducting of MAPEER survey, interviewed SMEs expressed wide range of their views about the term "research". It is of an utmost importance to notice that SMEs that do not match MAPEER criteria for being considered as RTD programme active, also perform certain research activities. These research activities are mostly not formal and not driven in the way and procedure demanded by official RTD programmes (gathering of documentation, reporting, verification of results and indicators, etc). Furthermore, these individual research activities are being conducted on the subjects and themes not predicted by available and official RTD programmes. Lack of laboratory capacities for implementation of applied research activities and certification and verification of achieved results are leaving local SMEs in position where they have to conduct their laboratory related research activities in foreign countries (EU and/or non-EU member states), or simply to postpone, cancel or give up from implementation of research activities..

MAPEER survey has shown that the main barriers for the involvement of SME in R&D&I activities are almost equally distributed between knowledge, financial, program related and external barriers, both for RTD programme active and RTD programme inactive SMEs. Slight difference in the perception of barriers between RTD programme active and RTD programme inactive SMEs are expressed only in the scope of access to information on available RTD/innovation support programmes, where RTD programme inactive SMEs are more experiencing this barrier. Additionally, RTD programme active SMEs are having less problems then RTD programme inactive SMEs in finding cooperation partners for research projects. Table below present main findings in accordance with collected answers on main problems/barriers face in undertaking R&D and innovation activities of RTD programme active SMEs, RTD programme inactive SMEs and SME stakeholder organizations/institutions.

Table 22: Main barriers/problems for undertaking RTD

	RTD programme active SMEs		RTD programme inactive SMEs		Stakeholders point of view	
	Knowledge barriers		**Knowledge barriers**		**Financial barriers**	
1.	*Most significant*	Lack of access to external knowledge (like universities, R&D institutions etc.)	*Most significant*	Lack of internal R&D exploitation capabilities	*Most significant*	Lack of in-house funds
	Least significant	Lack of information on technologies or markets	*Least significant*	Lack of information on technologies or markets	*Least significant*	Innovation costs too high
2.	**Financial barriers**		**Financial barriers**		**External barriers**	
	Most significant	Lack of in-house funds	*Most significant*	Lack of access to external financing sources	*Most significant*	Insufficient integration of SMEs in the relevant policy-making
	Least significant	Innovation costs too high	*Least significant*	Lack of in-house funds	*Least significant*	Uncertain / limited demand for innovative goods or services in relevant markets
3.	**External barriers**		**Programme related barriers**		**Programme related barriers**	
	Most significant	Insufficient integration of SMEs in the relevant policy-making	*Most significant*	Difficulties related to programme procedures / requirements	*Most significant*	Difficulties related to programme procedures / requirements
	Least significant	Difficulties in finding cooperation partners	*Least significant*	Problems with IPR protection	*Least significant*	Lack of access to information on R&D /innovation support programmes
4.	**Programme related barriers**		**External barriers**		**Knowledge barriers**	
	Most significant	Difficulties related to programme procedures / requirements	*Most significant*	Uncertain / limited demand for innovative goods or services in relevant markets	*Most significant*	Lack of information on technologies or markets
	Least significant	Lack of access to information on R&D /innovation support programmes	*Least significant*	Difficulties in finding cooperation partners	*Least significant*	Lack of access to external knowledge (like universities, R&D institutions etc.)

Source: MAPEER Survey 2010

Analysed needs of local SMEs are confirming presence of strong demand for actions undertaken by the organizations/institutions considered as SME stakeholders, aimed on raising the internal capacities for RTD (knowledge), creation of financial schemes of support to RTD (with increased amounts of financial resources for distribution) and adjusting of available RTD programmes to fit more to SMEs capabilities and capacities.

c. Key success and failure factors for SMEs participation in view of RTD /innovation programmes within the specific national context, at cross sectoral level as well as in comparison with FP programmes,

As already mentioned in this report, experiences of local SMEs concerning the participation on RTD programmes comes almost exclusively from National/Regional RTD programmes. For Bosnia and Herzegovina as a non-EU country, EU funded programmes had and still have limited availability. This resulted in lack of information on statements and opinions of SMEs regarding EU RTD programme participation. Main inputs for making conclusions on key success and failure factors for SMEs participation in view of RTD /innovation programmes, came from the evaluation of SME statements on general reasons for not participating in RTD programmes (National/Regional RTD and EU RTD programmes) and general main needs of SMEs to participate in RTD programmes (both National/Regional and EU funded).
Through the analysis of general reasons (barriers) for not participating in RTD programmes following conclusions can be made (presented in the table below):

Table 23: Comparison of main barriers (reasons) – National/Regional RTD programme vs. EU RTD programme

	Answers of SMEs		**Answers of SME stakeholder institutions/organizations**	
	National/Regional RTD programme	**EU RTD programme**	**National/Regional RTD programme**	**EU RTD programme**
	Financial barriers	**Financial barriers**	**Financial barriers**	**Financial barriers**
Most significant	Low funding rates	Unavailability of additional sources of finance	Unavailability of additional sources of finance	Low funding rates
Least significant	Unavailability of additional sources of finance	Low funding rates	Inability to get loans, provide bank guarantees, etc.	Inability to get loans, provide bank guarantees, etc.
	External barriers	**External barriers**	**SME-internal barriers**	**SME-internal barriers**
Most significant	Limited marketing/information about programme(s)	Limited/lack of assistance/guidance from programme officers	Limited networks/links with potential partners	Irrelevance of programme aims to SME's interests
Least significant	Inappropriate technological conditions	Inappropriate market conditions	Limited in-house knowledge on project management	Limited in-house knowledge on project management
	Administrative barriers	**Administrative barriers**	**External barriers**	**Administrative barriers**
Most significant	Bureaucracy/non-affordable application procedure	Long proposal evaluation procedures	Limited / lack of assistance / guidance from programme officers	Bureaucratical / non-affordable application procedure
Least significant	Long proposal evaluation periods	Not transparent proposal evaluation procedures	Limited marketing/information about programme(s)	Long time-to-contract period
	SME-internal barriers	**SME-internal barriers**	**Administrative barriers**	**External barriers**
Most significant	Not perceiving need to participate in R&D programmes	Limited in-house knowledge on project management	Bureaucratical / non-affordable application procedure	Limited / lack of assistance / guidance from programme officers
Least significant	Limited networks/links with potential partners	Irrelevance of programme aims to SME's interests	Long time-to-contract period	Limited marketing/information about programme(s)

Source: MAPEER Survey 2010

Interesting points in comparison of National/Regional RTD programmes and EU RTD programmes in terms of reasons (barriers) expressed by SMEs, are in the following facts:

- In Financial barriers, Low funding rates is considered as the most significant reason for not participation in National/Regional RTD programme and least significant for not participating in EU RTD programmes.
- In Administrative barriers, Long proposal evaluation periods is considered as the most significant reason for not participating in National/Regional RTD programmes, and in the same time, least significant for not participating in EU RTD programmes.

Main needs of SMEs in terms of their participation in RTD support programmes, from the RTD activeness and RTD inactiveness point of view, are presented in the table 24.

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Table 24: Needs of SMEs – RTD programme active vs. RTD programme inactive

	RTD programme active SMEs	**RTD programme inactive SMEs**
	External needs	**Administrative needs**
Most significant	Appropriate market conditions	Simple reporting requirements
Least significant	Adequate marketing of/information about programme(s)	Simple application procedures
	SME-internal needs	**External needs**
Most significant	Compliancy of programme aims to SME's interests	Appropriate market conditions
Least significant	Adequate in-house knowledge on project management	Appropriate technological conditions
	Administrative needs	**SME-internal needs**
Most significant	Short proposal evaluation periods	Compliancy of programme aims to SME's interests
Least significant	Adequate assistance/guidance during project by Project officer	Adequate in-house knowledge on project management
	Financial needs	**Financial needs**
Most significant	High funding rates	High funding rates
Least significant	Availability of additional financing opportunities	Availability of additional financing opportunities

Source: MAPEER Survey 2010

d. Best practice and bad practice cases of R&D&I programmes regarding the support to SMEs

As already mentioned in this report, in the situation where there is a lack of programmes and initiatives for support to RTD projects of SMEs, it is not significant to identify available programmes as "good" of "bad" practice. MAPEER SME project has identified five (5) programmes, available to SMEs in Bosnia and Herzegovina, and which are offering (or which have offered) very flexible frame for SMEs to participate. In general terms, identified programmes can not be classified as "good" or "bad". Their very existence is a positive thing. However, the amounts of grants awarded to SME RTD projects are low, symbolic, and often not sufficient for more complex and demanding RTD activities.

e. Recommendations on RTD /innovation support activities and / programmes

Table 25: Future expectations regarding RTD – cross tab, RTD Active – RTD Inactive – SME stakeholders point of view

Future expectations	R&D Active SMEs (Average mark)	R&D Inactive SMEs (Average mark)	SME stakeholder institutions/organizations
Develop measures to support access to market and faster commercialization of R&D results	4,11	4,41	4,5
Create / increase tax incentives for SMEs that develop R&D activities	3,95	4,39	4,25
Improve promotion about R&D programmes so that SMEs better understand their benefits	4,15	4,28	4,75
Improving in-house knowledge / relevant expertise	4,24	4,21	4,5
Lowering barriers on access to external knowledge	4,06	4	4,25
Lowering barriers on access to external funds / financing	4	4,2	4,75
Lowering barriers on access to market / R&D programme information	4	4	4,5
Improving networking between SMEs and research partners	3,94	4,13	4,75
Simplifying participation in relevant R&D programmes	3,81	4	4,75
Improving IPR protection rules	3,42	3,83	4,5
Integrating SMEs in relevant national / regional policy-making	4,42	4,18	4,75
Promoting open innovation (This type of innovation implies that companies may be able to buy or license processes or inventions from other companies and/or R&D organizations (incl. contract research); or that the innovation processes may be taken outside of a company sector through forms licensing, joint ventures, spin-offs and other collaborative mechanisms.)	4	3,83	3,75

Source: MAPEER Survey 2010

Analysis of SME recommendations for future, as well the recommendation of SME stakeholder organizations, are confirming presence of a number of different activities to be undertaken in order to raise the level of RTD in local SMEs. MAPEER survey has shown there is a wide range of different actions which could support involvement of SMEs in RTD, as well as the planning and designing of new RTD programmes.

Collected evaluation marks given by interviewed SMEs and SME stakeholder organizations/Institutions are showing that:

- Compared with SME points of view, SME stakeholder organizations/institutions are giving more significance on the potential measures and activities planned to be undertaken in the future. While the SMEs are putting higher accent on the financial aspects of support (demanding higher amounts of financial support), SME stakeholder organizations/institutions are pointing out the importance of more time - flexible procedures for application. In case the SME has a good projects proposal on the subject of RTD, it is important to make possible to apply for support in implementation regardless from announcing the call.
- In-depth interviews with representatives of SME stakeholder institutions/organizations are pointing-out the complexity of application procedures for International/EU funded programmes and necessity of their simplification.
- More efficient integration of SMEs in actual planning and designing of RTD programmes is also considered as an imperative by both SMEs and SME stakeholder organizations/institutions.
- Strengthening of local capacities for planning and implementation of RTD programmes (State organizations/Institutions) needs to be conducted in order to raise the quality and quantity of SME RTD projects. This is particularly stressed by the SME stakeholder organizations/institutions.
- Active assistance of programme's personnel is necessary in order to simplify application procedure for SMEs and raise chances for funding of their RTD projects. This is demanded both by the interviewed SMEs and SME stakeholder organizations/institutions.
- Interviewed SME stakeholder organizations/institutions are also suggesting strengthening of internal SME capacities for RTD, conducted in cooperation with Universities and Research institutes and with the strong support of National/Regional authorities.
- Promotion activities on best and good practices of SME RTD projects should be a continuous activity (proposed by SME stakeholder organizations/institutions).
- Distribution of more financial resources for SME RTD projects should attract more SMEs (proposed by SME stakeholder organizations/institutions).

f. Key-drivers and recommendations for the development of SME specific programmes and initiatives

This report have shown that Bosnia and Herzegovina, in order to have RTD and Innovation oriented SME sector and economy in general, needs to devote more attention in developing of supporting programmes and initiatives. As the basic conclusion of this report, there are number of crucial facts which must be taken in account during the (re)planning and (re)designing of programmes aimed on RTD and Innovation activities of SMEs. The conclusions of the survey are transferred to following recommendations (note that

recommendations under 3, 4, 5, 6, 7 and 8 are actually conclusion of MAPEER project Round table event):

1. SME stakeholders (state institutions in the first place) need to provide more financial and technical efforts in strengthening of their internal capacities and the capacities of SME sector and Research/Science institutions for undertaking RTD and Innovation projects.
2. The number and financial value of programmes available for RTD and Innovation should be increased. Additionally, available programmes should be more visible (promoted more efficiently) to SMEs and Research/Science institutions.
3. RTD projects of SMEs should be one of the basic elements of SME development in the future.
4. All responsible ministries and institutions should start working on the task of setting up the operational system of functional cooperation between SMEs and Science and Research organizations and institutions (Universities and Institutes).
5. Intermediary role of chambers, agencies, associations/clusters in establishing of cooperation links between SMEs and Science and Research organizations and institutions (Universities and Institutes) should be improved.
6. Capacities for providing of services to SMEs should be strengthen, primarily through establishing of accredited laboratories.
7. Databases and infrastructure of Chambers of Commerce and Business Associations/Clusters for identification of SME needs in RTD needs better utilization.
8. Opportunities for SMEs given by National/Regional and/or EU Framework Programme and other EU RTD programmes should be more promoted.

g. Key strengths and weaknesses of the country and its SMEs as regards research and innovation

Key strengths of SMEs from Bosnia and Herzegovina as regards research and innovation in comparison with MaPEeR SME findings:

1. SMEs have qualified, skilled and experienced personnel for conducting technical (manufacturing) activities within their branch.

Weaknesses of SMEs from Bosnia and Herzegovina as regard research and innovation in comparison with MaPEeR SME finding:

1. Low level of SME involvement in technological platforms or clusters.

2. Lack of in-house knowledge on management and experiences from implementation of research projects within National/Regional and International/EU funded programmes.

3. Lack of access to external knowledge (like universities, R&D institutions etc.).

4. Lack of financial assets for RTD activities.

ANNEX I: List of References

Ministry of Foreign Trade and Economic Relations of Bosnia and Herzegovina (2008): **"Strategy of SME development in Bosnia and Herzegovina (BiH) 2009 – 2011".**

Republic's Agency for development of SME in Republic of Srpska (2005): **"Strategy of SME development in Republic of Srpska (RS) 2006 - 2010"**.

Republic's Agency for development of SME in Republic of Srpska (2009): **"Progress report on the implementation of the Strategy of SME development in Republic of Srpska (RS) 2006 - 2010"**.

Ministry of economy, energy and mining of Republic of Srpska (2009): **"Analysis of the situation in SME sector for 2008"**.

Ministry of development, entrepreneurship and crafts of Federation of Bosnia and Herzegovina (2007): **"Development of small and medium entrepreneurship in Federation of Bosnia and Herzegovina (FBiH)"**.

Institute for statistics of Republic of Srpska (2010): **"Innovation activities statistics in Republic of Srpska for the period 2006 - 2008"** – experimental pilot research.

Elke Dall, Information Office of the Steering Platform on Research for Western Balkan Countries, Project see-science.eu (2008): **"Science and Technology in the Western Balkans"**.