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Comparative Analysis – Final Report

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1. Executive Summary

The present document is Deliverable 5.2 Final Comparative Analysis of the MaPEer study. Combining and further elaborating the other deliverables of the MaPEer study, the Comparative Analysis serves three main purposes, i.e. to understand commonalities and differences in relation to the features of existing national / regional programmes supporting SMEs as well as in SME behaviour and perceptions about the main needs and barriers in participating in research and innovation activities; secondly, to identify good practice elements and programmes and thirdly, to suggest specific ways forward.

The MaPEer study contributed significantly to the existing knowledge base of SME support programmes by gathering information about a number of national / regional programmes supporting research and innovation (187 in total of EU27 plus BiH). By examining their differences and commonalities a typology was created based on the share of programme budget going to SMEs, the funding rates to SMEs and the thematic focus of the programmes.

This typology consists of three main programme clusters, the ‘SME-targeted’ cluster, the ‘open cluster’ and the ‘sectoral’ cluster. The programmes in the ‘SME – targeted cluster’, presenting the highest SME participation (85%) and success rates (77%) do not usually have any specific thematic focus. This cluster of programmes seems to focus more on innovation related support targeting the development of new products, services and processes, enabling not only cooperation and technology/knowledge transfer, but also creation of start-ups or spin-offs.

Programme features of the SME-targeted cluster include:

- ❖ higher funding rates to SMEs (around 80%);
- ❖ short time-to-contract (shorter than 3 months for the highest share of programmes);
- ❖ simple administrative and reporting procedures;
- ❖ full ownership of research results by SMEs; and
- ❖ relatively small projects (such as Innovation Vouchers).

The two other clusters present lower SME participation rates (50% for the ‘sectoral’ and 61% for the ‘open’ cluster) and success rates, respectively (38% and 54%), respectively. The ‘sectoral’ cluster programmes support SMEs in specific sectors such as ICT, manufacturing, biotechnology and environmental technology. The programmes in the sectoral cluster are usually characterised by:

- ❖ relatively high funding rates (68%); but
- ❖ rather long time-to-contract (shorter than 3 months for only 17% of the programmes); and
- ❖ simple administrative requirements and procedures.

The ‘open’ cluster includes programmes neither targeted by size, nor sector. Most of these programmes are designed to enhance the establishment of innovation networks and clusters among companies and S&T organisations. The ‘open cluster’ features include

- ❖ low funding rates to SMEs (ca. 10%);
- ❖ rather long time-to-contract (with 50% of the programmes taking longer than 6 months); and
- ❖ full ownership of research results by SMEs;
- ❖ requirement for the market research to be linked to the proposal (62%).

MaPEer also revealed differences across different R&D capacity groups of SMEs¹ in relation to their problems, needs and barriers in engaging in research and innovation activities. These differences reflect the weaknesses and strengths of the national / regional programmes in their home countries but also different awareness levels about innovation and its requirements and benefits and different levels of programme participation.

More specifically, the main problems faced during participation in R&I programmes were related to ‘complex reporting requirements’. This was mostly marked by low as well as high R&D capacity firms coming from the new Member States (NMS²) followed by those in Southern Europe (SE³). Long times (evaluation periods, time-to-funding, time-to-contract) were also noted mostly by high R&D firms from SE while long time to funding was marked by low as well as high R&D firms from NMS. These differences are verified by the features of the respective national programmes. Indeed most programmes in the SE and NMS countries suffer from complex administrative requirements and procedures as well as long time-to-contract and time-to-funding as recorded in the MaPEer National Programme Reports.

The other type of problems noted was of financial nature. In particular, it was the ‘unavailability of additional sources of finance’. This was marked by both low and high R&D capacity firms in NMS and SE but also by high R&D firms in Northern Europe (NE⁴). This reflects a general absence of multiple financial sources in the specific national contexts which was also verified as one of the major reasons for not participating in R&I programmes. In addition, the general inability to get loans and risk guarantees was marked as a major reason for not participating especially by SMEs in SE and NMS. ‘Inadequacy of complementary support measures’ was also highlighted as another problem during programme participation especially by SME in SE but also high R&D capacity SMEs in NE. The noted ‘inadequacy’ possibly indicates a gap of measures to support research and innovation closer to the market thus covering the whole innovation chain, which was indeed acknowledged in most of the MaPEer National Programme Reports.

Overall, administrative burdens and financial problems were the major problems both while participating in projects as well as reasons for not participating. The different nature of these problems before and during participation calls for a multiple-perspective and integrated approach in dealing with them.

A call for higher funding rates was also expressed by SMEs when asked to identify the most important needs for participating in research and innovation programmes. This was noted as a need by SMEs in all R&D capacity groups, across all regions and sizes. However, the need for higher funding rates has to be treated with caution. Given the context – specificities of funding rates (they can be different between different actions in the same programme, let alone across different programmes and countries) it deserves careful examination as ‘higher’ may have different meanings in different contexts.

¹ MaPEer identified five groups of SMEs profiles (based on the features of the respondents to MaPEer surveys) differentiating SMEs according to their R&D capacity level, i.e. share of full-time employees dedicated to R&D, annual R&D income and expenditures, job positions created or sustained as a result of introducing new or substantially improved products or processes. Thus, five categories of R&D capacity levels were defined, i.e. the ‘low’, ‘medium low’, ‘medium’, ‘medium high’ and ‘high’ R&D capacity SMEs. Differences were examined between the low and high R&D capacity groups.

² NMS: New Member States are the countries that joined the EU since 2004: Bulgaria, Bosnia Herzegovina, Poland, Estonia, Lithuania, Latvia, Hungary, Slovenia, Czech Republic, Slovakia, Romania, Malta, and Cyprus.

³ SE: Southern European countries are Portugal, Spain, Italy, and Greece.

⁴ Northern European countries are Sweden, Denmark, Finland, Ireland, and the UK.

Issues of financial and administrative nature were also stressed as the main overall barriers for undertaking research and innovation activities. In the case of SMEs from SE however, it was awareness and knowledge-related barriers that followed the financial barriers in rank, reflecting lack of linkages between research and innovation, limited demand for innovation in the local markets, and limited awareness of innovation and its related benefits.

In line with the barriers and needs identified, SMEs noted certain good practice elements that would contribute to making a programme successful in attracting SMEs. These include:

- Administration elements: simple administrative requirements and procedures, short times-to-contract and funding;
- Financing elements: high funding rates, and improved access to finance;
- Awareness and counselling elements: provision of personal counselling, mentoring and mediation to SMEs before and during the project, and improved publicity and marketing of the programmes.

Certain programmes were identified to present most of these elements. It is interesting that good practice programmes were identified across all the three programme clusters, and not mainly from the SME-targeted cluster as one might expect.

Concluding, SMEs, SME stakeholders and programme managers made several recommendations reflecting the specific problems, needs and barriers noted above. These can be grouped under four main categories:

- Recommendations related to programme design: improve the accessibility of programmes to SMEs by covering all sectors and sizes of SMEs, apply a demand-driven approach by focusing more on SME needs, develop measures to support access to market and faster commercialisation of R&D results;
- Recommendations related to programme administration and funding: cutting red tape, simplifying reporting and administrative requirements, ensure transparent evaluation procedures, shorten time-to-contract and time-to-funding, and increase funding rates;
- Recommendations related to broader financial issues: improve access to risk finance, lower barriers on access to external funds / financing, increase tax incentives;
- Recommendations related to knowledge and networks: increase promotion and marketing of programmes; provide counselling, mentoring and assistance to SMEs before and during the project, create networks between industry and knowledge institutions.

The European Experts Panel on SMEs and Research created under MaPEer addressed the total of the above recommendations with very concrete suggestions. The Panel also made more generic recommendations dealing with the overall barriers to SMEs in undertaking research and innovation activities. These included, among others, adopting ‘open innovation’ practices to foster better inter-firm collaboration, fostering pre-commercial procurement to stimulate innovation, or intensifying the dissemination of good practices between the EU and national levels. It is imperative that these recommendations are taken up at national and EU level.

2. Introduction

The present document is Deliverable 5.2 Final Comparative Analysis of the MaPEer study. The Comparative analysis builds upon and further elaborates the findings of the WP2 national reports and Compendium (Deliverable 2.4) and the WP3 national reports and EU level analysis (Deliverable 3.4). It also takes into account the comments made on the Draft Comparative Analysis (Deliverable 5.1) which was presented at the MaPEer Final Conference in Brussels, 6th October 2011.

Overall, the Comparative Analysis aims to conclude on:

- A minimum of commonalities and differences of research and innovation programmes supporting SMEs in EU-27 and Bosnia and Herzegovina;
- SMEs profiles and related needs and barriers/obstacles affecting their participation in research and innovation related activities in EU-27, and how well existing good practices address their needs;
- Good practice elements and lessons learnt, and finally;
- Make recommendations for research and innovation programmes wishing to target SMEs at European and national levels.

The total of the findings and recommendations refer to five main categories which form the following sections of the report: Programme design for SMEs; Programme administration and funding; Broader financial issues; Knowledge and networks, guidance and awareness; and New approaches in fostering research and innovation for SMEs. In turn, the next section focuses on the good practice elements based on the previous discussions on SME needs, barriers and problems and identifies certain programmes as examples of good practices. The last section includes the main conclusions from the preceding analysis.

3. Programme design for SMEs: a many-fold issue

The MaPEer study contributed significantly to the existing knowledge base of SME supporting programmes by gathering information about a number of national / regional programmes supporting research and innovation (187 in total of EU27 plus BiH). The examination of the main features of the different national / regional programmes on the basis of the cluster analysis lead to a typology in terms of three key indicators, such as the share of programme budget going to SMEs, the funding rates to SMEs and the thematic focus of the programmes. In this regard it was possible to identify certain programmes that are oriented towards SMEs more than the other programmes in terms of addressing SMEs specifically as the main beneficiary. These programmes formed the so-called ‘SME-targeted’ cluster of programmes.

The ‘SME-targeted’ cluster was characterised by the largest average share of programme budgets going to SMEs (94%). Most of the programmes in this cluster did not have a specific thematic / sectoral focus. The funding rates offered to SMEs by the programmes in this cluster were the highest in the three clusters (80%). The majority of the programmes in this cluster also presented high participation and success rates for SMEs (85% and 77% respectively). The majority of the programmes in this cluster (58%) had simple administrative procedures, one evaluation stage (89%) and needed between 3-6 months as the average time-to-contract (42%) but there was also a significant 40% that took less than 3 months. 70% of the programmes in this cluster tended to offer full-ownership of results to SMEs. The average project budget in this group tended to be at the lower scale, i.e. 52% of the programmes had average project budgets less than 100K€, and 35% between €100-500K. The programmes in this cluster presented the most cases (44%) in comparison with the other clusters where handling risk by providing certifications or guarantees was not required.⁵

The programmes in this cluster seemed to focus more on innovation (rather than research) related support targeting the development of new products, services and processes, enabling cooperation and technology/knowledge transfer but also creation of start-ups and spin-offs, innovation vouchers or non-R&D activities credit services.

The two other clusters were the ‘sectoral’ cluster and the ‘open’ cluster. The programmes in the ‘sectoral’ cluster mainly aimed at improving the R&D capacity of firms active in the specific strategic sectors of the economy, such as ICT, manufacturing, biotechnology and environmental technology. The programmes in this cluster were usually characterised by relatively high funding rates, rather long time-to-contract but simple administrative requirements and procedures, relatively large projects (in terms of size) and strict requirements to handle risks.

The ‘open’ cluster included programmes that were not targeted either by size, or by sector. Most of these programmes were designed to enhance the establishment of innovation

⁵ This may be a result of applying the de minimis rule in State Aid. Article 88(3) of the Treaty establishing the European Community requires state aid to be notified to the European Commission so that it can assess whether the aid is compatible with the common market in the light of Article 87(1). The de minimis rule was introduced in order to exempt small aid amounts from this obligation. More specifically, when the aid provided to a firm is below the current ceiling €200,000 for three consecutive years it is exempted from the notification requirement. (http://europa.eu/legislation_summaries/competition/state_aid/126121_en.htm) In these cases the requirements for handling risks may be less strict. This may explain the high percentage of no strict requirements in the specific cluster as the average project budget in 52% of the programmes is even below €100K.

networks and clusters among companies and S&T organisations. Other programme features included a relatively low funding rate to SMEs, a rather long time-to-contract and complex administrative requirements and programme procedures, full ownership of results to SMEs and usually a requirement for market research at the proposal stage.

Table 1: Main features of the MaPEer programme typology

Programme features	Sectoral programme cluster	SME-targeted programme cluster	'Open' programme cluster
Budget share to SME > 50%	No (37%)	Yes (94%)	No (50%)
Sectoral focus	Yes	No	No
Funding rates to SME (% of eligible costs)	Upper Medium (68%)	High (80%)	Low (10%)
High Participation Rates (51-100%) of SMEs	50%	85%	61%
High Success Rates (51-100%) of SMEs	38%	77%	54%
Simple admin. procedures till contract sign.	53%	58%	38%
Time-to-Contract <3 months	17%	40%	20%
Time-to-Contract 3-6 months	51%	42%	30%
Time-to-Contract >6 months	32%	18%	50%
Market Research linked to proposal (yes)	49%	49%	62%
Full SME ownership of the research results	46%	70%	58%
One evaluation stage	75%	89%	69%
Handling risk	Yes (78%)	Yes 56%-No 44%	Yes (72%)
Project budget	Medium-high 100-500K & >500	Low-moderate <100K & 100-500	Medium-high 100-500K & >500

Source: Amended from MaPEer Deliverable 2.4, pp. 35-8

(*) Percentages do not include missing values

The need to apply a demand-driven approach by focusing more on SME needs in the programmes' design was a key message echoed in more than half of the country cases studied under MaPEer (EU 27 plus BiH). To improve the accessibility of programmes to SMEs suggestions were made that mainly focused on covering all sectors and sizes of SMEs (found in 25% and 18% respectively of the MaPEer National Programme Reports). This recommendation was echoed by individual SMEs and SMEs stakeholders contacted by MaPEer.

The above findings confirm to a certain extent the need for SME oriented programmes to be open to all sectors and SME sizes. They further indicate a stronger emphasis in the programmes of the SME-targeted cluster than the other two clusters for higher funding rates, simpler administrative procedures and shorter time-to-contracts. In addition the SME-targeted cluster of programmes has relatively smaller projects (in terms of budget) than the other two clusters and thus the lowest share of strict requirements to handle risk.

Accordingly, the EEP on Research for SMEs, created under MaPEer, echoed the recommendations related to programme design and further noted the need for:

- Redefining the SMEs categorization and setting different participating rules and intensity in State Aid;
- Launching very small research projects where SMEs can be important players. It was further noted that creation of large consortia at the early stages of research is not necessary. The “think small first” principle should be applied in SME oriented programmes. The organization of large and ambitious consortia may be relevant and necessary after receiving some preliminary encouraging results;
- Better focusing calls for proposals to clearly identify the roles and possibilities for SMEs;
- In proposal evaluations move from “pure excellence” towards “excellence and exploitability of results-benefits for the community”, to establish the necessary link with closer to the market research and exploitation of results;
- Mandating a minimum participation of SMEs in large initiatives, like European Technology Platforms (ETP), Join Technology Initiatives (JTI) or Private-Public-Partnerships (PPP) but at the same time avoiding ‘artificial’ enlargement of project Consortia with SMEs participation.

4. Programme administration and funding: simplification, transparency, and specialisation

Looking into the details of the problems and barriers faced by SMEs, issues of programme administration and funding were highlighted in several respects.

Programme administration issues were the major problems faced by SMEs during participation in research and innovation programmes. In particular, ‘complex reporting requirements’ was the problem that was rated highest (between 3.4-4 on a 1-5 point scale) by all types of SMEs especially in Southern Europe and new Member States. Indeed, in most of these countries the administrative requirements as well as the procedures until contract signatures for the national / regional programmes recorded under MaPEer were usually considered as time-consuming and complex.⁶

Table 2: Main problems during participation in national / regional research and innovation programmes

Problems during participation	Low R&D SE	High R&D SE	Low R&D NMS	High R&D NMS	Low R&D NE	High R&D NE
Project related problems						
Low technical understanding of pjct officer(s)	3,4	3,3				3,3
Complex reporting requirements	3,4	3,9	4	3,6		
Limited / lack of guidance after pjct	3,6	3,3				
Limited / lack of guidance during pjct	3,8	3,8			3,3	3,3
External problems						
Inadequacy of complementary support measur.	3,8	3,5				3,8
Unavailability of additional sources of finance	3,4	3,8	3,4	3,3		3,5
Inappropriate general economic conditions	3,2	3,3	3,4	3,3		3,3

(*) Values shown: above 3.2 on 1-5 point scale

(**): SE: Portugal, Spain, Italy, Greece

NMS: Bulgaria, Bosnia Herzegovina, Poland, Estonia, Lithuania, Latvia, Hungary, Slovenia, Czech Republic, Slovakia, Romania, Malta, Cyprus

NE: Sweden, Denmark, Finland, Ireland, UK

WE: Belgium, The Netherlands, France, Austria, Germany, Luxembourg – the results from SMEs from Western Europe countries are rarely discussed as they do not present strong deviations from the total average.

Administrative burdens were also among the major reasons why SMEs did not participate in research and innovation programmes (cf. Table 3). Again ‘complex reporting’ was highlighted the most by SMEs including also high R&D firms⁷ from Northern Europe (4.3). ‘Not transparent evaluation procedures’ were also noted by high R&D firms from NE (3.8) and NMS (4). Long times (evaluation periods, time-to-funding, time-to-contract) were mostly noted by high R&D firms from SE (with rates between 3.7-3.9). Long time to funding was also marked by firms from NMS (3.5-3.8). Firms in SE and NMS also noted the bureaucratic application procedure (with rates between 3.4-3.8). Indeed most programmes in these countries (SE and new MS) suffer from complex administrative requirements and procedures

⁶ Cf. MaPEer National Programme Reports.

⁷ MaPEer identified five groups of SMEs profiles (based on the features of the respondents to MaPEer surveys) differentiating SMEs according to their R&D capacity level, i.e. share of full-time employees dedicated to R&D, annual R&D income and expenditures, job positions created or sustained as a result of introducing new or substantially improved products or processes. Thus, five categories of R&D capacity levels were defined, i.e. the ‘low’, ‘medium low’, ‘medium’, ‘medium high’ and ‘high’ R&D capacity SMEs. Differences were examined between the low and high R&D capacity groups.

as well as long time-to-contract and funding as recorded in the MaPEer National Programme Reports.

Administrative issues were also marked the highest as the most important needs of SMEs in order to participate in research and innovation programmes. This was true for all R&D capacity groups, regions and SME sizes. Issues like ‘simple application and reporting procedures’, short times (to contract, to funding, and evaluation periods), ‘transparent proposal evaluation’ and ‘guidance during the project’ were all ranked above 4 on a 1-5 point scale. ‘Difficulties with programmes procedures/requirements’ stood out, alongside financial issues, as a major overall barrier in undertaking research and innovation activities with rates around 3.5 on a 1-5 point scale.

Accordingly, cutting red tape was perceived as being crucial for designing SME-friendly programmes as documented in the MaPEer National Programme Reports. In 32% of the cases it was recommended to simplify overall reporting and administrative requirements and roughly 30% supported speedy assessment procedures, as reflected in the shortening of time from application to funding.

In relation to programme funding issues, low funding rates was also noted as a reason for not participating in national research and innovation programmes (cf. Table 3). This came mainly from SMEs in SE and NMS (with rates between 3.5-4 on a 1-5 point scale). However, this has to be treated with caution for several reasons. Firstly, the funding rates to SMEs vary considerably even between different activities in the same programme, let alone across different programmes and countries. Secondly, in several cases like the SE and in new MS most programmes have to comply with the Structural Funds rules, which allow funding rates that may be over 65% in some cases depending on the type of activities supported and the regions the supported SMEs belong to. Thirdly, certain programmes from NE countries indeed have low funding rates to SMEs that may be below 50%⁸. However, the SMEs from these countries did not note this as a major reason for not participating in national programmes. Thus, the specific results reflect the facts to some extent but also SMEs’ perceptions within an overall demand for higher funding rates.

Indeed, when asked to identify the most important needs for participating in research and innovation programmes, SMEs of all R&D capacity, across all regions and sizes noted ‘higher funding rates’ with rates above 4 on a 1-5 point scale. Thus, given the context – specificities as explained above, the request for higher funding rates deserves careful examination as ‘higher’ may have different meanings in different contexts.

Reflecting the above, recommendations by SMEs and relevant stakeholders in this area (programme administration and funding) focused on cutting red tape, simplifying procedures and requirements, ensuring more transparent evaluation procedures, shortening time-to-contract and time-to-funding, and increasing funding rates.

The EEP on Research for SMEs echoed these recommendations and made additional suggestions like:

- Perform a posteriori checks as practiced by tax authorities;
- Remove the need of SMEs to submit financial guarantees when getting involved in research projects;
- Adapt the timing of payments to the expenses’ schedule.

⁸ cf. MaPEer Deliverable D2.4 – Programme Compendium.

The call for simplification of procedures was echoed several times in the MaPEer final conference. However, the remark was made to apply a differentiated approach depending on the size of the funding. Simplification was also attached to the call for uniformity of procedures that was made in the MaPEer Final Conference. It was suggested that uniform application procedures along common standards are established across different programmes at the national level and even between the national and the EU level programmes.

5. Broader financial issues: complementarity of measures and plurality of sources

Broader financial issues were the second major type of problems while participating in programmes and were marked more intensely by micro and small firms (cf. Table 2). The most highlighted problems of this type were ‘inadequacy of complementary support measures’ and ‘unavailability of additional sources of finance’. The inadequacy of complementary measures was highly ranked by SMEs in Southern Europe (3.5-3.8 on a 1-5 scale of importance) as well as high R&D capacity SMEs in Northern Europe (3.8). This is possibly indicating a gap of measures to support research and innovation closer to the market, which was in general highlighted in most of the countries studied.⁹ This lack was reflected in the recommendations made by individual SMEs who noted the need for developing measures to support access to market and faster commercialisation of R&D results.

The lack of additional financial sources was noted by both high and low R&D capacity firms in new MS and SE (rates between 3.4 – 3.8) but also by high R&D firms in NE (3.5). This reflects a possible gap in multiple financial sources and it is understandable given that the venture capital market for example is still underdeveloped in most of the new MS and SE countries¹⁰.

Financial barriers, alongside administrative burdens, are also the major reasons why SMEs do not participate in research and innovation programmes (cf. Table 3). They are more pronounced for micro firms, and firms from Southern Europe as well as high R&D capacity firms from new Member States. They include ‘inability to get loans, provide bank guarantees’ (with rates ranging from 3.5 for low R&D capacity SMEs in Southern Europe, to 3.8 and 4 for high R&D capacity firms in NMS and Southern Europe) ‘unavailability of additional sources’ (with rates between 3.5-4) and ‘low funding rates’ (with rates between 3.5-4).

Indeed most of the programmes in these countries (new Member States and Southern Europe) do require bank guarantees or similar types of evidence to minimise risks¹¹. At the same time there are rigid framework conditions not favouring engagement in innovation activities.⁵

⁹ Cf. MaPEer National Programme Reports

¹⁰ See for example the relevant country national reports in ERAWATCH

(http://erawatch.jrc.ec.europa.eu/erawatch/opencms/information/reports/country_rep/index.jsp?country=-1&count_rep=cae72cc9-79df-11df-8da9-53862385bcfa)

¹¹ Cf. MaPEer National Programme Reports.

Table 3: Main reasons for not participating in national / regional research and innovation programmes

Reasons for not participating	Low R&D SE	High R&D SE	Low R&D NMS	High R&D NMS	low R&D NE	high R&D NE
Administrative barriers:						
Bureaucratic application procedure	3,4	3,6	3,5	3,8	3,3	3,3
Long time-to-contract		3,9				3,7
Long time-to-funding		3,9	3,5	3,8		
Long proposal evaluation periods		3,7				
Not transparent evaluation		3,4		4		3,8
Complex reporting requirements		3,6		3,4		4,3
Financial barriers:						
Low funding rates	3,5	4		3,8		
Inability to get loans, etc	3,5	4,6		3,4		
Unavailability of additional sources	3,6	4		3,5		

(*)Values shown: above 3.3 on 1-5 point scale

(**): SE: Portugal, Spain, Italy, Greece

NMS: Bulgaria, Bosnia Herzegovina, Poland, Estonia, Lithuania, Latvia, Hungary, Slovenia, Czech Republic, Slovakia, Romania, Malta, Cyprus

NE: Sweden, Denmark, Finland, Ireland, UK

WE: Belgium, The Netherlands, France, Austria, Germany, Luxembourg – the results from SMEs from Western Europe countries are rarely discussed as they do not present strong deviations from the total average.

Reflecting the reasons for not participating as noted above, the high R&D firms from SE marked especially the ‘availability of additional financing opportunities’ as well as the ‘limited requirements to get loans, guarantees, etc.’ (with rates 4 and 4.4 respectively) as major needs of SME in order to participate in research and innovation programmes.

Accordingly, the main overall barriers for undertaking research and innovation activities in general were also of financial nature. These were mainly ‘lack of access to external financing sources’ and ‘lack of in-house funds’. These types of overall barriers received rates around and above 3.8 on a 1-5 point scale by all different groups of SMEs and were emphasised the most by high R&D micro SMEs reflecting the importance of access to funds for this specific cohort.

However, it has to be kept in mind that the lack of capital is not necessarily the most serious obstacle to investing in R&D (Ortega-Argilés and Voigt, 2009). SMEs may face two major barriers to innovation: 1) financial – lack of funds for innovating, too high risk for innovation projects, or too expensive technology and 2) manpower – no qualified personnel or lack of time by key personnel.¹² The major problems are linked to financial resources, but also to knowledge, human capital and management competences¹³.

Notwithstanding, SMEs highlighted the need to bridge the gap in measures supporting near-to-market research and innovation, improve access to risk finance, lower barriers on access to external funds / financing, and increase tax incentives for SMEs that develop R&D activities.

¹² Avedas, et. al. (2010), SMEpact Impact assessment of the participation of SMEs in the Thematic Programmes of the Fifth and Sixth Framework Programmes for RTD.

¹³ European Commission, 2003c as referred to in Ortega-Argilés and Voigt, (2009), ‘Business R&D in SMEs’ JRC/IPTS working paper on corporate R&D and innovation No. 07/2009.

The EEP on Research for SMEs further suggested to:

- Assist the consortia or individual partners having conducted research activities to approach potential customers by organising relevant meetings throughout the project life cycle and beyond;
- Promote contacts with venture capital organisations;
- Complement grants with loans to achieve access to 100% funding of the overall cost of their investment in the R&D projects;
- Provide SMEs extra grant-vouchers allowing any research project at National or European level to extend the consortium and bring SMEs on board at any time of the project lifetime in favour of 1 or 2 SMEs and up to 10% of the overall project budget.

6. Knowledge and networks, guidance and awareness: always important even if not the core of the problem

After the ‘complex reporting requirements’ SMEs stressed the problem of ‘lack of guidance’ during and after the project (in relation to the exploitation phase) (cf. Table 2). These problems were more marked by low as well as high R&D firms coming from Southern Europe (between 3.3-3.8 on a 1-5 point scale). ‘Low technical understanding of project officers’ was also noted as a problem by low and high R&D firms in South Europe and high R&D firms in North Europe (between 3.3-3.4). This may reflect a possible deficiency in terms of human resources and availability in the programme managing authorities. At the same time ‘improving in-house knowledge and relevant R&D experience of SMEs’ was a recommendation made especially by high R&D capacity SMEs in NMS and also small and medium-sized firms (with rates 3.8 and 3.9).

Limited marketing of national programmes did not seem to be an issue. However, the limited marketing of programmes was rated high for EU programmes with the low R&D firms from South Europe, new Member States and Western Europe scoring it with rates 3.5, 3.3 and 3.9 respectively. Overall, there was a plea for ‘easy access to information’, ‘adequate marketing of programmes’, and ‘external assistance during the project’ that was made especially by the low R&D capacity SMEs who noted these needs as very important alongside the administrative and financial needs (with rates between 3.8 – 4.1 on a 1-5 point scale).

The ‘lack of access to information about programmes’ was also a major barrier in undertaking research and innovation activities in general. This was marked again mainly by low R&D capacity SMEs with rates around 3.5 and was reflected in the relevant recommendations made by the specific group of SMEs.

It is interesting that the low R&D firms especially from SE instead of the programme-related barriers (such as complex procedures) marked knowledge-related barriers as the second major category. They clearly noted the ‘lack of access to external knowledge’, ‘limited knowledge of the advantages of R&D and innovation’, and ‘lack of information on technologies and markets’ (with average rate 3.6) as important. This clearly reflects the problem of lack of linkages between research and innovation as well as the limited demand for innovation in the local markets - which was marked relatively high by all SME groups but less so by high R&D firms in NE - and thus the limited acknowledgement of the related benefits.

A distinction also appeared in the perception of innovation costs. Innovation costs are perceived high by low R&D firms as well as by high R&D firms in new MS and SE. This may reflect the lack of information and awareness on the side of the low R&D firms. On the side of the high R&D firms it may also reflect rigid framework conditions that do not favour innovation in the new MS and SE countries.

In line with the above, 46% of all MaPEer National Programme Reports recommended providing personal counselling, mentoring and mediation to SMEs before and during the project by a key contact person (most often the project officer). At the same time in 29% of the cases the suggestion was made to create networks between industry and knowledge institutions. Individual SMEs also recommended increasing promotion and marketing of research and innovation programmes.

The EEP on Research for SMEs took these recommendations a step further by suggesting:

- Specific ways for improving the cooperation between SMEs and universities such as engaging of students and university professors in SMEs' research teams, or allowing student internships to work for a certain time through a grant scheme in highly innovative SMEs;
- Possible ways to improve understanding of projects and provision of guidance; for example by integrating professional, external consultants during the application process and the project duration; or provide training to programme managers, project officers and evaluators that may not be experts in innovation issues or in the specific conditions and constraints surrounding innovation in SMEs;
- Raising awareness by identifying relevant SME success stories and organising dissemination events especially oriented to SMEs on the benefits from participating in the research and innovation programmes, or identifying good practice elements from programmes like EUROSTARS and disseminating them to be adopted in programmes.

7. New approaches in fostering research and innovation for SMEs

In addition to those mentioned above the EEP for Research and SMEs made recommendations extending to broader issues characterising innovation activities and SMEs. The Panel suggested implementing novel approaches based on open innovation. Promoting open innovation was recommended as a quite important issue by individual SMEs in the MaPEer study especially from new Member States or Northern Europe (with 3.9 on a 1-5 point scale). The EEP noted the importance of fostering better inter-firm collaboration (i.e. SME-SME and SME-Large firms to create new business models) and co-operation among firms including their suppliers, customers and stakeholders recognizing that SME play a double role, i.e. as sub-contracted specialized research entities as well as users of research results.

Another important area that the EEP addressed was that of creating stronger links between the supply and demand -side policies. Within this context they recommended the support of pre-commercial procurement in order to stimulate innovation activities in SMEs with the government acting as early adopter of innovations.

Last but not least, the EEP emphasised the importance of enhancing and extending the specific programmes designed for SMEs at national, regional and European level. Creating synergies between programmes at the national and EU level was also an issue raised in this regard. The support given to SMEs by regional and national programmes, although useful and efficient, is not enough to build European wide networks where SMEs could contribute. Indeed, internationalisation benefits of national programmes received low marks in general (usually less than 3.3) in contrast with the case of the EU programmes, reflecting the limited coverage of the aspect of internationalisation of research activities in national programmes.

Under this framework a cooperation mechanism was recommended between national research and innovation programmes and EU programmes enabling successful SMEs at national programmes to be visibly promoted in European programmes, where new partners and new ventures at European level can be fostered.

8. Several good practices across the EU

Reflecting the barriers and needs in participation in research and innovation programmes, SMEs identified certain good practice elements that would contribute to making a programme successful in attracting SMEs. These include:

- Administration elements: simple administrative requirements and procedures, short times-to-contract and funding;
- Financing elements: high funding rates, and improved access to finance;
- Awareness and counselling elements: provision of personal counselling, mentoring and mediation to SMEs before and during the project, and improved publicity and marketing of the programmes.

Certain programmes were also noted to present most of these elements according to the SMEs' experiences. Good practice programmes include among others:

Name of Programme	Cluster/type of programme
Avanza (I+D) programme (ES)	Sectoral
CDTI – PID (ES)	Open
Ideas (LT)	SME-targeted
Industry 2015 (IT)	Sectoral
Innocsekk (HU)	SME-targeted
KMU Innovativ (DE)	Sectoral
Support for market oriented R&D activities (HU)	'Open'
Supporting business innovations (HU)	SME-targeted
Verbundforschung (BW) (DE)	'Open'
Vinnova Research & Grow (Forska & Väx) (SE)	SME-targeted
VMSP – APVV (SK)	SME-targeted
ZIM – Cooperation (DE)	SME-targeted
PRO-INNO (I+II)	Sectoral
FFG – Basisprogramme (AT)	-
FFG Cooperation Bonus (AT)	-
Intelektas (LT)	'Open'
Baross Gabor (HU)	-
QREN co-promotion (PT)	Sectoral

These programmes received several positive remarks across all R&D capacity groups of SMEs in terms of the degree to which they could be considered as good practice programmes. Adding to the list several programme managers interviewed noted the Innovation Vouchers (existing in UK, NL, DK, SN, DE) as good practice cases highlighting the simple and speedy procedures and administration.

It is evident that not only programmes that belong to the SME-targeted cluster present good practice elements. Good practice elements are found and appreciated by SMEs in programmes across all clusters. These findings confirm that SME-targeted programmes are indeed

appreciated by SMEs. At the same time they indicate that SMEs are also attracted by programmes not specially designed for them provided they present features favouring SME participation (such as simple procedures, short time-to-contract, etc.).

Box 1: Examples of good practice programmes and why they are appreciated by SMEs

Vinnova Research and Growth (Forska & Vax) (SE)

- Targeted to SMEs
- Simple administrative process

Zim (DE)

- Open to all topics, technologies and sectors
- Continuous application
- Transparency of information
- Easy rules and regulations
- Straightforward application and administration
- Several funding modules for precise funding solutions
- High probability of funding (72% success rate)

Programmes of Austrian Research Funding Agency –FFG (AT)

- Open to firms of all size without thematic focus

Innocest+ (HU)

- High funding rates
- Simple relative flexibility in including costs which fit the needs of the projects

Avanza (ES)

- Knowledge and reputation benefits remarkable
- Improved R&D linkages with universities and research institutes
- It helped to enhance the in-house knowledge and competences

Industria 2015 (IT)

- Good capacity to promote the collaboration between large and small enterprises and between companies and academia
- Collaboration both with University and large enterprises on complex technological projects, favouring SMEs' visibility and credibility in the market

GOP 1.3.1 Supporting business innovations (HU)

- Providing support for close to market developments

9. Conclusions

SMEs are the backbone of the EU economy. At the same time, research and innovation seems to be the best, if not the only, way to deal with grand societal challenges facing European societies. The role of SMEs and their involvement in research and innovation is inseparable from the development of the smart, sustainable and inclusive growth that Europe aspires to achieve.

The problems that need to be tackled in facilitating the involvement of SMEs in research and innovation are manifold. They refer to specific programme-related conditions in terms of design, administration and management, but also non-programme related issues. Weaknesses in relation to knowledge and competence acquisition and networking by SMEs are also important.

R&D programme active and inactive SMEs, or different R&D capacity SMEs or SMEs coming from different regions or size-categories may face these problems to different extents. However, overall, there is unanimity in relation to the general barriers and needs SMEs have in order to participate in R&D programmes and which reflect accordingly the good practice elements of programmes.

There is a plurality of programmes supporting SMEs in undertaking research and innovation activities in all MS (plus BiH). However, based on the good practice elements SMEs had identified, there is significant room for improvement in all types of national / regional programmes, even those that are specifically SME –oriented. At the same time other programmes although not mainly oriented towards SMEs can and do favour SME participation.

Reflecting the needs and barriers SMEs face, the recommendations made fall under certain categories: programme design, administration and management; programme finance, broader financial issues, knowledge acquisition and networking. These recommendations compiled the views of individual SMEs which were in line with the views of programme officers, and SME stakeholders. The European Experts Panel on SMEs and Research created under MaPEer addressed the total of the above recommendations with very concrete suggestions while also making more generic recommendations dealing with the overall barriers to SMEs in undertaking research and innovation activities. It is imperative that these recommendations are brought to discussions and acted upon by the relevant national and EU stakeholders.