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TASK 1: POLICY PAPER ON INNOVATION

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1 EXECUTIVE SUMMARY

Romania has no innovation policies which are specifically regional. The national innovation policy-making body - the National Authority for Scientific Research (NASR) has no regional coordination of RDI activities and has a limited role in spurring innovation potential at regional level, although its mission includes the support of regional and local development. Innovation policies and implementing instruments have been designed by NASR with a national focus, and target public and private R&D performers (national R&D institutes, public R&D organisations, university research centres, business firms with R&D activities, etc.) across the country. A regional focus in RDI policy implementation has only recently been adopted, such as monitoring of regional distributions of projects funded by the 2007-2013 National RDI Plan, regional Research Exhibitions, the Innovation Roadshow, the INNOBAROMETER.

An incipient instrument for regional innovation emerged in recent years in the form of the Regional Innovation Strategies (RIS) developed by the Regional Development Agencies (RDAs) in six Romanian regions (West Region Bucharest-Ilfov, North East Romania, North West Romania, South East Romania, South Muntenia) in the context of their affiliation to the Innovating Regions in Europe Network. The integration between the RIS and the national RDI strategy and instruments is weak, due to NASR's limited regional outreach and collaboration with the RDAs, RDAs' poor capacity to implement regional innovation strategies, lack of innovation legal competences and expertise, understaffing and shortage/lack of experienced personnel in project management, limited capacity to stimulate cooperation between regional stakeholders, lack of strategically-focused regional RDI policies suited to the specific strengths and weaknesses of the region, strong reliance on input from the central level and political clientelism, poor inter- and sub-regional collaboration, etc. The RDA are NGOs that work on the basis of service contracts concluded with the central government and are only a facilitator of interactions between regional players or with foreign investors, having primarily an administrative role, but no policy or strategy capacity.

The ERDF contributes to innovation policy through two Operational Programmes (OPs): (i) Increasing Economic Competitiveness (SOP IEC), which accounts for the largest share of ERDF funds for innovation (50.3%) and addresses innovation objectives in Priority Axes 1, 2 and 3, and (ii) Regional Development (ROP), which accounts for only 3% of the ERDF funds and addresses innovation objectives in Priority Axis 4. Overall, ERDF resources for innovation represent only 9% of the total ERDF funding. Evidence on the progress and effectiveness of the Structural Funds for innovation provided by the Romanian Government's 2009 Annual Implementation Report and National Strategic Report on the Implementation of Structural and Cohesion Funds shows that the ERDF global absorption rate since 2007 until end 2009 was rather low, at only 10.3%, but this appears to be within normal limits for this stage of the implementation cycle, in comparison with other EU Member States.

After a slow start in 2007 and a series of preparation activities in 2008, in 2009 the focus was placed on contracting. Only a very small part of contracted projects have been completed to date, and most have significant delays in implementation. Progress indicators of the two OPs are in most cases zero or relatively low, which suggests very limited development and impact. At this early stage, the main achievement so far can therefore be considered to be the implementation of mechanisms by which the ERDF funds are being distributed, although their functionality is often hindered by problems at several levels: the governance system, the OP implementation system, the weak capacity of public and private beneficiaries, especially SMEs, to provide good quality proposals in a timely manner and ensure their co-financing part, and external factors, especially related to the economic crisis. Some corrective measures have been taken to correct these deficiencies, but they seem to be insufficient and only modestly effective.

There is no specific evidence of the way ERDF funds for innovation are spent at the regional level because of a serious gap in the current institutional design and policy approach of authorities in charge with the two OPs, which makes the collection of such evidence very difficult: NASR, who has legal competences for innovation, has no regional oversight, and the Ministry of Regional Development and Tourism, who has regional oversight, has no legal competences in innovation. The RDAs, who have the bulk of information at regional level, play only a facilitator and administrative role and have no innovation policy or strategy role. Moreover, given the pressure for increasing the SF absorption rate, both at the central and at the regional level, the current focus is mainly on contracting rather than on policy, evaluation or coordination.

The lack of regional innovation policies, the institutional and policy gap in monitoring regional innovation developments, combined with multiple structural, technical and management deficiencies and insufficient corrective actions creates a 'vicious circle' of under-achievement and low absorption of ERDF funds that is not likely to be fixed in the in the current economic situation of the country and governance mode that attaches little importance to innovation. Although the SOP IEC and ROP are an important source of funding for innovation in the context of drastic cuts in the public RDI resources and diminishing resources of the business sector, potentially contributing to economic recovery and reduction of the unemployment induced by the financial crisis, the existing evidence suggests that these funds are managed in a passive way, guided strictly by administrative criteria. The main challenges that need to be overcome in the future for innovation policy to be effective focus on several levels:

- *At the level of the governance system:* a change of policy-makers' vision of the role and importance of innovation is necessary, as well as of their role in this process, from passive distributors of funds to active coordinators guided by relevant policy criteria, reflecting regional and national needs. NASR needs to have a stronger authority in the horizontal integration of RDI objectives in the other ministries' strategies and policies, and needs a stronger policy support to achieve that. There is a need to review NASR's current thinking about the lack of a regional

innovation policy, strengthen its regional outreach and collaboration with the RDAs and other regional authorities, and ensure effective linkages between the National RDI Strategy and policy instruments and the RIS, as well as other existing national strategies. The legal status of the RDAs and their limited role in managing the regional use of ERDF funds needs to be rethought for more effective results and for better correlation between the six RIS and with the national strategy and policy instruments. There is also a need to improve RDAs' communication with central structures, their human resources and capacity for strategic planning through training courses (e.g. in project management, regional foresight, etc.), the design of inter- and intra-regional collaboration projects and mobility schemes, increase the role of local universities as nuclei of knowledge and expertise that could be better put at the service of the broader community.

- *At the level of the OP implementation system*: improve the project management capacity of administrators through training courses, workshops, learning from the experience of OP administrators in more advanced countries, etc.

- *At the level of both public and private beneficiaries, especially SMEs:* improve the capacity to prepare and manage projects, by organizing training/teaching courses for potential beneficiaries and also for the consultants on the domestic market, which seem to be still in formation and providing services of uneven quality, by involving local university academics and researchers who have been successful in accessing ERDF funds for innovation.

- *Other factors*: increase the awareness on the funding opportunities provided by the OPs and the application conditions, reduce banks' reluctance to provide loans and stimulate the development of financial markets and of specific instruments for funding innovation projects, stimulate the cooperation between firms and the scientific community.

2 NATIONAL AND REGIONAL INNOVATION POLICY AND THE CONTRIBUTION OF ERDF

2.1 NATIONAL AND REGIONAL INNOVATION POLICY

Main features of national innovation strategy in terms of objectives and policy measures

Romanian national RDI strategy is designed and implemented by the Ministry of Education, Research, Innovation and Sports (MERIS), through its National Authority for Scientific Research (NASR), which is the only government body that has the mission to formulate and implement RDI policies. MERIS collaborates with other ministries involved in RDI activities[1] and a few agencies

[1] Ministries of Economy, Trade and Business Environment; Public Finances; Regional Development and Tourism; Agriculture and Rural Development; Environment and Forests; Communications and Information Society; Transport and Infrastructure; Labour, Family and Social Protection; Health, and National Defence. The link between MERIS-NASR and these ministries is ensured primarily by the National R&D institutes they coordinate.

with specific RDI-related functions[2]. Other collaborators include advisory bodies[3], funding agencies[4] and other national institutions involved in the formulation of R&D policies and strategic decision-making[5]. The coordination and integration of RDI activities and policies across other economic policy areas is poor, as NASR lacks sufficient powers to influence and align sectoral R&D plans of other ministries with the overall RDI development agenda for which it bears responsibility. A stronger grip of NASR on the design and management of RDI policies and funding of R&D projects has been recently recommended to improve the effectiveness of policy support and public funding to RDI in Romania (Innova Europe 2010).

The major national RDI strategy document is the **2007-2013 National RDI Strategy**[6], which defines three strategic objectives of the RDI system (p. 15):

1. Knowledge creation for increasing the performance and international visibility of the RDI system

2. Increasing economic competitiveness through innovation and knowledge transfer;

3. Increasing social cohesion by using RDI to solve local, regional and national problems related to health, environment, infrastructure, land management and utilization of national resources.

These policy objectives are implemented through several funding instruments, most of which are coordinated by NASR, as shown in Exhibit 1 below:

Exhibit 1-Funding instruments and coordinating institutions

Coordinated by NASR[7]:	**2007-2013 National Plan for R&D and Innovation** (http://www.mct.ro/img/files_up/1188313586PN2%20eng.pdf) **Core Programmes** (http://www.mct.ro/index.php?action=view&idcat=229) **Sectoral R&D plans** (http://www.mct.ro/index.php?action=view&idcat=230). **Sectoral Operational Programme Increasing the Economic Competitiveness (SOP IEC)** (http://www.mct.ro/index.php?action=view&idcat=28). **National R&D programme IMPACT** (http://www.mct.ro/index.php?action=view&idcat=381).
Coordinated by other institutions: Romanian Academy National Council for Academic Research	**National priority R&D projects** **Programme of scientific research grants** (for scientific careers and development of research teams around scientific personalities)

[2] For example, the National Institute for Statistics and the National Commission for Prognosis.
[3] The Consultative Board for RDI, the National Council for Research in Higher Education Institutions, the Commission for Social Dialogue, National Council for Ethics, the Romanian Committee for Research Infrastructures.
[4] National Centre for Programme Management, the Executive Unit for Funding Academic Research, the Managerial Agency for Scientific Research, Innovation and Technology Transfer.
[5] Romanian Academy and branch academies like the Academy of Medical Sciences, Academy of Agriculture and Forestry Sciences and the Academy of Technical Sciences.
[6] See details at: http://www.mct.ro/img/files_up/1188316504strategia%20eng.pdf
[7] See Table 1 in Annex G for a brief description of NASR-coordinated programmes.

Translation of the national strategy into regional policy

Romania is divided into eight development regions (North-East, South-East, South Muntenia, South-West Oltenia, West, North-West, Centre, and the Capital region Bucharest-Ilfov). They do not have an administrative status and are only territorial units (corresponding to NUTS 2 classification of regions) created by the voluntary association of 5-6 counties, for which regional development policies are formulated and implemented, in view of more efficient use of resources from national programmes and Structural Funds. The eight regions are co-ordinated at the national level by the by National Council for Regional Development, and at the regional level by eight Regional Development Councils and eight Regional Development Agencies (RDAs).

The main development objectives in each region receiving assistance are specified in the regional development strategies, which are included in the National Development Plan (currently at its 3rd edition, for the period 2007-2013) and the National Strategy for Regional Development. At regional level, the implementing entities are the RDAs, which propose the regional development strategy, implement the national policy on regional development and collaborate with the local administration to identify less favoured areas where investment facilities could apply, as a measure of decentralisation of regional development funds. In practice, their role is very limited, because of the way they are designed and function: as NGOs that operate on the basis of service contracts in relation with the central government and have no policy-making role. RDAs are seen primarily as a facilitator of interactions between regional players or in the relation with foreign investors, and feel a lack of legitimacy to exercise stronger influence. In spite of some significant improvements in the management capabilities of the RDAs (e.g. introduction of quality standards and modern information management systems, Project Implementation Units as a core structure for the management of infrastructure projects), they have a limited project management capacity in general, and innovation projects management in particular, as they do not have innovation legal competences and expertise. In addition, as many other local authorities in general, they are faced with important shortage of human resources, especially with experience in project management, underpayment and poor motivation to work in these institutions.

"The result is that the RDAs are administrative units of a national Regional Operational Programme that does not include any real weighting of objectives to reflect regional priorities. The RDAs, while trained to do so, do not have the staff time available for research and support for developing and deepening regional plans. They have been given no role in trying to encourage sub-regional collaboration between Counties to maximize synergy. None of the regional co-ordination and planning structures appears to be working on strategic issues. The main function appears to be a forum through which Local Authorities can influence the division of the regional OP budget. Key regional offices of Ministries are not involved in any regional discussions with the poor national co-ordination between ministries also reflected at the regional level." (LRDP Kantor, p. 56)

Regional disparities have increased over the last decade, especially between the capital region Bucharest-Ilfov and the rest of the country, both in terms of economic development and RDI resources (see the discussion of a recent MERIT study and Tables 1-7 in Annex G for a description of regional gaps). In addition, there are also intra-regional disparities, which display a 'mosaic structure' typical to a low regional integration of economic mechanisms. Both these disparities have deepened in recent years due to the economic restructuring and unemployment generated by the closing down of loss-making state enterprises, particularly in mono-industrial zones, inappropriate fiscal policies, little or no spill-over effects of existing industrial or RDI capacities (e.g. research institutions, science parks, etc.) or creation of new ones to stimulate regional development, poor linkages between industry and academia, lack of coherent urban/rural development policies, etc. As a result of the low regional economic integration, the development opportunities of the most advanced region - Bucharest-Ilfov have not had a significant regenerative or knock-on effect in the neighbouring regions, and the capital remains surrounded by some of the most underdeveloped counties of the country.

The regional dimension of innovation policies

In spite of these marked regional RDI disparities, Romania has no regional innovation policies designed/coordinated at national level by NASR. NASR has no regional coordination of RDI activities, although its mandate includes the task "to stimulate regional and local development" (Innova Europe, 2010). RDI policies and implementing instruments (i.e. the programmes described in Exhibit 1above) have been designed by NASR with a national focus and target public and private R&D performers (national R&D institutes, public R&D organisations, university research centres, business firms with R&D activities, etc.) across the country, without any specific regional focus. The regional level is addressed only as another level of application of national policies, next to the local one. An incipient regional focus in NAR's RDI policy implementation (not design) has only recently been adopted, exemplified by the monitoring of the regional distributions of projects funded by the 2007-2013 National RDI Plan[8] (see Tables 5 and 6 in Annex D), nine regional Research Exhibitions[9], the Innovation Roadshow[10] and NASR's production of INNOBAROMETER as

[8] These distributions highlight the dominance of the Capital region, followed by the North West (around Cluj-Napoca) and the North East (around Iasi) regions, confirming that RDI project performance and absorption of RDI funds are most significant in the large cities that host important universities and research institutes. Four thematic areas of complex projects, namely "Materials, processes and innovative products", "Environment", "Agriculture, Food Safety and Security" and "Health" are best represented at regional level. Certain regions, such as S. East, Centre and South, are more prominent in "Agriculture, Food Safety and Security", while "Energy" is more present in the S. West region (NASR 2008).

[9] Organized in 2008 by the regional Chambers of Commerce and Industry in collaboration with the national network of technology transfer and innovation infrastructure ReNITT, these events aimed to attract R&D units and business firms from the respective regions and enhance their collaboration.

[10] Organized in 2008 by local public administrations, RDAs and Chambers of Commerce in all development regions to enhance the absorption of national R&D results by domestic companies and increase their competitiveness. Events included conferences, seminars, meetings between representatives of R&D units and business firms, especially SMEs, introducing new products and technologies realised in the national R&D institutes and in universities, as well as funding opportunities

an annual analysis of regional and national innovation[11], but these measures cannot be considered an active move towards an explicit regional RDI policy to design or support strategic RDI priorities in the regions.

An incipient instrument for regional innovation emerged in the early 2000s in the form of the ***Regional Innovation Strategies (RIS)*** developed by six Romanian regions on the basis of their affiliation to the Innovating Regions in Europe (IRE) Network[12], as follows:

i. **West Region** developed its RIS in the framework of the RIS-NAC (Regional Innovation Strategies in Newly Associated Countries) projects financed by DG Enterprise. The project was carried out during 2002-2004 and aimed to enhance regional innovation and competitiveness through optimising innovation policies and infrastructure. The resulting 2004-2008 RIS was implemented since October 2005 with EU assistance, and a follow up 2009-2013 RIS was recently issued (available at http://www.regiuneavest.ro/assets/ris_en_03_12_2009.pdf) (see Annex F for a detailed presentation of the West RIS content).

ii. **Bucharest-Ilfov, North East Romania, North West Romania, South East Romania, South Muntenia** developed their RIS in the context of New Member States and Associated Countries projects financed by DG Enterprise. The projects were conducted during 2005-2008, having the same aims and methodology as above. A follow up 2008-2103 RIS was prepared by the South Muntenia region, but no similar follow-ups have been identified for the other regions (see Annex F for details).

In terms of RIS design (structure and objectives) there is a high degree of similarity between the six RIS covering the period 2005-2008, which arises from the IRE five-step "unique, tried-and-tested approach to the promotion of innovation"[13]. A certain differentiation arises from the way in which the five steps above have been adapted to the specific economic and RDI characteristics of the regions, such as the *AutomotiVest - Regional Cluster Initiative in the Automotive Sector* in the West Region, which was the first formal attempt to develop an automotive cluster, or the first

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from government sources. The Roadshow had a positive impact of on the local business community, as assessed by polls organized in all the regions where such events took place (see details on www.fabricadebani.ro).

[11] The 2008 issue of the INNOBAROMETER presents several regional innovation indicators that confirm the huge disparities between the capital region and all the other development regions of the country (see Table 7 in Annex D).

[12] IRE Network was created by the European Commission in the mid-1990s to facilitate exchange of experience and good practice among European regions, support innovation and competitiveness among regional firms through the development and implementation of regional innovation strategies and schemes.

[13] (i) Initiating regional dialogue; (ii) Direct involvement of all relevant organisations in shaping innovation policy; (iii) Analysis of regional innovation needs and capacities; (iv) Selection of priorities for innovation support; (v) Development of action plans and pilot projects. Selected from: http://ec.europa.eu/enterprise/ire/Innovating-regions/www.innovating-regions.org/network/presentation/projects024d.html?project_id=1

Regional Institute for Education, Research and Technology Transfer (IRECTT), created on the model of the European Institute of Technology in the North West Region (see details in Annex F).

Overall, the RIS provide a good description of regional strengths, weaknesses and opportunities, and highlight ambitious objectives that are most relevant and necessary to the respective regions, but they do not provide an operational basis for action, since they don't have own funding sources. The funding sources available for these objectives are the Regional Operational Programme (ROP) and the Operational Programme 'Increasing Economic Competitiveness' (SOP IEC) (Priority Axes 1, 2 and 3), which are progressing relatively slowly, as will be shown in section 3. Another potential funding source is the 2007-2013 National RDI Plan, which operates on a national competition basis and has no specific regional provisions. Moreover, the public funding provided through this channel has been drastically cut since 2009 and its impact was significantly reduced. So far, there is no evidence of synergies between the six RIS, or the RIS and the National RDI Strategy and policy instruments, or of inter-regional collaborations supported by the RIS. On the one hand, it can be argued that it is still too early for depicting a clear impact, but on the other, there is no central or regional body to perform such an evaluation, collect data and assess impact in view of policy follow up (since NASR, which is in charge of innovation has no regional oversight, and MDRT has regional oversight, but no competences in innovation), and the interim evaluation of the main RDI national instruments (e.g. the 2007-2013 National RDI Strategy, National Network of Innovation and Technology Transfer) that could possibly highlight some interactions with the RIS is foreseen for later in 2010 (the 3rd quarter 2010 and the 1st quarter 2011, respectively). The lack of evidence is also due to other factors, like poor communication and coordination between the implementing agencies - the RDAs for RIS, NASR for national RDI policies, and MRDT for the ROP.

Role of ERDF

For the period 2007-2013, Romania is eligible only for the OPs under objectives *Convergence* and *Territorial Cooperation with neighbouring countries* and receives an overall amount of EUR 19,667 million from Structural Funds (ERDF and ESF) that is distributed as follows:

- The *Convergence* objective accounts for approx. 98% of this amount (MEUR 19,213) that is allocated to seven OPs (see Annex E for an overview of the seven OPs). Among them, three OPs (ROP, SOP IEC and Technical Assistance) receive ERDF funding only, and two (Environment and Transport) receive joint ERDF and ESF funding (see Tables 4 and 5 in Annex A).
- The *Territorial Cooperation with neighbouring countries* objective accounts for the remaining 2% (MEUR 455) that is allocated to six OPs, all financed by the ERDF (Table 6 in Annex A).

The ERDF is thus the most important funding source for the OPs that are active in Romania. The global absorption rate of ERDF from 2007 until the end of 2009 was rather low at only 10.3%, but it appears to be within normal limits for this stage of the implementation cycle, when compared

with other EU Member States (Government of Romania 2010). ERDF resources for innovation account for only 9% of total ERDF funding and are allocated to two OPs: **SOP IEC** (which accounts for 50.3% of the total ERDF funding) and **ROP** (which receives only 3.0%) (see Table 1 in Annex A). Within these OPs, innovation objectives are addressed by specific Priority Axes (PAs) briefly described below.

SOP IEC PA1: An innovative and eco-efficient productive system

This PA provides support to increase direct productive investments of Romanian SMEs and large enterprises and improve their market access. It helps overcome the difficulties arising from limited financial resources, the country's significant technological gap and lack of know-how in business development. Target beneficiaries are both existing enterprises that need to modernize and develop their products and technological processes, and new enterprises, especially from processing industry and specialized services that need qualified and integrated assistance for a proper development of business environment. This PA also supports enterprises, especially SMEs, to improve the industrial base, revive the business environment and generate new innovative enterprises, introduce new technologies and quality standards, develop the business sector, improve access to capital and foster technological development. In order to meet market requirements and improve the quality and range of products and services, support is granted within this PA to tangible and intangible competitiveness factors and technological innovation. The support offered for direct productive investments in SMEs and large firms through this PA is complementary to ROP PA4 (KIA 4.3), which offers a similar support to micro-enterprises.

SOP IEC PA 2: Research, Technological Development and Innovation (RTDI) for competitiveness

This PA aims to increase the R&D capacity of and stimulate cooperation between RDI institutions and enterprises, and increase enterprises' access to RDI results, thus counteracting the effects of a long-standing low level of funding (both public, and private) for RDI, which has led to obsolete RDI infrastructure, loss and ageing of researchers, poor RDI performance, low access of enterprises to RDI activities and technology transfer, ultimately translated into a large technology deficit and a low innovation score in Romanian enterprises. In terms of sectoral approach, this PA focuses only on five of the nine thematic priorities defined in the 2007-2013 National RDI Strategy (e.g. Health; Agriculture, food security and safety; Energy; Environment; Advanced materials, products and processes), all considered to have the highest impact on economic productivity. Important synergies are expected between SOP IEC PA2 and PA1, i.e. enterprises that receive funding from PA2 can also seek support for productive investments and access to new markets from PA1. Likewise, enterprises supported under PA1 can get support under PA 2 to meet their knowledge needs. Other synergies are with the ESF funded OP Human Resources PA1 and PA3[14].

[14] *PA1. Education and training in support for growth and development of a knowledge-based society*

SOP IEC PA 3: ICT for private and public sectors

This PA has the objective to increase interactions between the public sector, enterprises and citizens by improving the ICT infrastructure in market failure areas (under-served rural and small urban areas), developing and effectively using electronic public services, developing a secure and dynamic e-business environment, introducing innovative productive systems in administration and in the daily life, and developing a competitive market for new products and services. This PA is complementary to ***Romania's 2009-2015 Broadband National Strategy,*** which was launched in July 2009 as a pre-condition to access Structural Funds. Strategic objectives include the deployment of broadband infrastructure in under-served areas and greater availability and attractiveness of e-services. The Strategy specifies a set of priority sectors, such as government, education, health, economy, which play a determinant role in the development of broadband services market.

ROP PA 4: Strengthening regional and local business environment

This PA aims to set up and develop regional and local business support structures (e.g. industrial, business parks, business incubators etc.), especially in the less developed and declining areas, rehabilitate industrial sites and support regional and local entrepreneurial initiatives, in order to attract investors, facilitate job creation and sustainable economic growth. Other key activities envisage support to technology transfer to micro enterprises, in line with the Regional Innovation Strategies (RIS). This PA is meant to narrow the large disparities between the country's regions in terms of entrepreneurial and industrial development that deepened in recent years.

2.2 ERDF CONTRIBUTION ACROSS POLICY AREAS

ERDF contribution to innovation is concentrated in three policy areas shown in Exhibit 2 below in the order of their funding shares, also showing the key expenditure categories they are associated with and the OPs through which they are implemented (see Tables 2 and 3 in Annex A for details). This distribution of ERDF funding for innovation by policy area and expenditure category reflects the key priorities of Romanian R&D and innovation policies, which aim to strengthen the research and innovation capacity in both public and private sectors.

- *KIA 1.2. University education for the knowledge society* (modernisation of higher education and the enhancement of academic research capacity). This complementarity is particularly relevant to higher education institutions.
- *KIA 1.5. Doctoral and post-doctoral research programmes*. One specific objective pursued here, especially by universities, is to create training modules for developing managerial competences of PhD and postgraduate students, and the knowledge transfer between research institutes, universities and firms.

PA3. Increasing adaptability of workers and enterprises

- *KIA 3.1. Promoting an entrepreneurial culture* though formation of managerial skills especially for micro-enterprises and SMEs, encouragement of entrepreneurship, through support services for starting a business.

Exhibit 2 - ERDF contribution by policy area and OP

Policy area	ERDF funds for innovation (%)	Key expenditure categories to which ERDF funding is allocated and respective shares	OP/Priority Axis
Innovation-friendly environment	40.94%	'Advanced support services for firms and groups of firms'- 38.16% 'Services and applications for citizens (e-health, e-government, e-learning, e-inclusion') - 26.75% 'Services and applications for SMEs (e-commerce, education and training, networking, etc.)' - 20.07%	SOP IEC PA1: An innovative and eco-efficient productive system PA2: RTDI for competitiveness, PA3: ICT for private and public sectors.
			ROP PA4: Strengthening regional and local business environment
Boosting applied research and product development	34.62%	'Measures to stimulate research, innovation and entrepreneurship in SMEs' - 31.42%; 'Investments in firms directly linked to research and innovation' - 27.12%; 'Assistance to SMEs for promoting environmentally-friendly products and production processes' - 25.95%.	SOP IEC PA2: RTDI for Competitiveness
Knowledge transfer and support to innovation poles and clusters	24.44%	'R&TD infrastructure and centres of competence in a specific technology' - 70.58%; 'Assistance to RTD, particularly in SMEs' - 10.98%; 'Technology transfer and networking' - 18.43%.	SOP IEC PA2: RTDI for Competitiveness ROP PA4: Strengthening regional and local business environment

Innovation-friendly environment policy area, which accounts for the largest share of ERDF funding for innovation (40.94%), addresses a major weakness of the Romanian R&D and innovation system, i.e. the low innovation capacity of the business sector. The number of innovative enterprises in industry and services is low and has only slightly increased in recent years, from 17% in 2000-2002 to 21.1% in 2004-2006 (National Institute of Statistics 2008). Among the innovative enterprises in 2004-2006, 4.1% were process innovators, 1.9% were product innovators and only 15% were both product and process innovators. The low innovative capacity of Romanian enterprises is also reflected by the very low values and low growth rates of some European Innovation Scoreboard indicators (INNO Policy TrendChart, 2009), such as: BERD (about 20-22% of the EU27 average over the last 5 years, 0% growth), Venture capital (between 0.9% and 7.4% of the EU27 average over the last 5 years, 3.5% growth), SMEs innovating in-house (2.6% growth), Innovative SMEs cooperating with others (0.6% growth), Firm renewal (SMEs entries + exits) (-0.1% growth), Public-private co-publications (6.4% growth), Product/process innovators (SMEs) (2.1% growth), Employment in medium-high/high-tech manufacturing (1.6% growth), Knowledge-intensive services exports (2.3% growth) and New-to-market sales (-9.2% growth). Regional statistics on innovating companies show the same disparity between the Capital region and the

rest of the country discussed above (National Institute of Statistics 2008). A recent study of the National Institute of Statistics (2008) shows that barriers to innovation are largely common to both SMEs and large firms, and they include lack of own and external funding, lack of qualified personnel, high innovation costs and market domination by established firms. The problem is all the more significant as SMEs represent over 99% of the total active enterprises in Romania (99.4% in 2004) and account for approx. 54% of total employment in industry and services and 56.9% of turnover (ANIMMC, 2004). In recent years, the share of SMEs in the total population of active firms has increased, as a combined effect of restructuring processes in large companies and market opportunities arising from the economic boom. However, as a consequence of the economic crisis that started to be felt in Romania mainly since the end of 2008, over 133,000 firms went out of business, 11 times more than in 2008, according to statistics of the National Office of Trade Registry[15]. Among them, SMEs have been hardest hit: half of Romanian SMEs have been 'catastrophically' or 'very highly' affected by the economic crisis, while only 2% declared they had not been affected at all. The number of SME bankruptcies doubled in the first half of 2009 compared to the same 2008 period, with the most affected sectors being trade, construction and real estate, according to the April 2009 survey of the National Council of SMEs in Romania[16]. Although the entrepreneurial spirit is relatively well developed in the country, SMEs need more and better economic instruction and knowledge of market potential, especially in the services area. From this perspective the SME focus of this policy area is most appropriate.

Boosting applied research and product development policy area promotes measures aimed to increase research and innovation investments in firms in general, and in SMEs in particular, which have low capacity in these areas – see e.g. the 2009 European Innovation Scoreboard indicators 'SMEs innovation in house' (17.9% of the EU average in 2006, 2.6% growth in 2008) and 'Innovative SMEs collaborating with others' (2.9% of EU average in 2006, 0.6% growth rate in 2008 (INNO Policy TrendChart, 2009). Indeed, a closer look into innovation expenditure in Romanian firms, broken down by activity and firm size class (National Institute of Statistics, 2009) shows that the highest expenditure share is accounted for by acquisition of machinery, equipment and software in all firm size classes (somewhat more in small and medium firms than in large ones), while R&D expenditure accounts for about 30% in small and medium firms and only 15% in large firms. Moreover, large firms appear to have the highest share of expenditure allocated to the acquisition of external knowledge, which suggests that they follow a development model primarily

[15] *Curierul National*, 'Cum salvăm IMM?', 19 July 2010 (http://www.curierulnational.ro/Economie/2010-07-19/Cum+salvam+IMM%3F).

[16] *Mediafax,* 'Jumătate dintre IMM-uri, afectate grav sau foarte grav de criza financiară', 5 May 2009, (http://www.mediafax.ro/economic/jumatate-dintre-imm-uri-afectate-grav-sau-foarte-grav-de-criza-financiara.html?1686;4294516)

based on acquisition of external knowledge and equipment rather than development of own R&D capacity. In contrast, small and medium firms invest predominantly in the acquisition of equipment, but place a higher focus than large firms on the development of own R&D capacity rather than relying on external knowledge. The low levels of business R&D, lower in large firms than in SMEs, are rooted in several structural and managerial deficiencies, including: poor competitive environment; firms' reluctance or inability to take on financial and commercial risks arising from R&D, and absence of financial services and instruments to mitigate the risk.

Knowledge transfer and support to innovation poles and clusters policy area addresses another important weakness of the Romanian RDI system, i.e. the poor links between the public R&D system concentrated primarily in national R&D institutes and institutes of the Romanian Academy, and the business sector, which has a poor R&D capacity and also a poor absorptive capacity. This policy area also aims to strengthen the research activities in universities and the commercialisation of academic research, which is poorly developed in Romania. Universities have weak linkages with the business sector and are essentially education providers, as their research activities account for only a small share of activities. Concepts like the 'entrepreneurial university' or 'university-industry consortia' have only recently emerged in the public debate and some support measures have been adopted, but their impact is still minor. Other target institutions addressed by this policy area are the innovation and business support organisations grouped in the *National Technology Transfer and Innovation Network (ReNITT),* managed by the NASR, which in 2008 included 50 specific entities (14 technology transfer centres, 20 technology information centres, 16 technology and business incubators), as well as 4 S&T parks located in different regions of the country (NASR 2009). The beneficiaries of the measures supported by these policy areas are public and private entities (national RDI Institutes and other RDI institutions, large firms and SMEs, universities, public authorities, NGOs, etc.) There is no evidence of financial assistance for innovation policy in inter-regional cooperation provided by the ERDF.

3 EVIDENCE AVAILABLE ON THE PERFORMANCE OF INNOVATION MEASURES CO-FINANCED BY ERDF

The implementation of the two OPs promoting innovation measures - SOP IEC and ROP - has stepped up in 2009, after a series of preparatory activities and awareness campaigns in 2007 and opening of most financing lines in 2008. 2009 was essentially a “contracting year”, with a rapid increase, particularly in the second half, in the number of contracts concluded with the beneficiaries, project implementation and payments (Government of Romania 2010). There is no specific evidence of the way ERDF funds for innovation are spent at the regional level because of a serious gap in the current policy approach and institutional design of authorities in charge with the two OPs, as follows:

- The large majority of ERDF funds for innovation are distributed through SOP IEC (PA1, 2 and 3), coordinated by the NASR, which has only national policies and no regional oversight. Therefore, there are no formal mechanisms to collect evidence on innovation developments at regional level, because there is no policy follow-up. The competition for allocating SOP IEC funds is open to the entire country and the applications must be related to the objectives of the National RDI Strategy and its implementing instrument, the National RDI Plan (and to a little extent to the RIS). However, the National RDI Strategy and Plan are in fact R&D oriented, and innovation objectives are defined in a very broad, unspecific way. NASR considers that the country doesn't have a real national innovation strategy and policy yet, but only a R&D Strategy with an innovation component (Programme 5 – "Innovation"). The very understanding of the word "innovation" is very variable, from the R&D institutes, which are the most important concentration of scientific potential but their R&D results have a poor absorption on the market, to business firms, which have little capacity for innovation, for several reasons discussed on p. 14-15.
- A small part of ERDF funds for innovation is distributed through POR PA 4, coordinated by MRDT, which has regional oversight, through the coordination of RDAs, but has no legal responsibilities on innovation. Both MRDT and NASR are only passive funders of projects received from the RDAs, and have no specific policy criteria for allocation of resources.
- At the regional level, the RDAs are only a facilitator of interactions between regional players or with foreign investors, and have primarily an administrative role (collect the proposals, have them evaluated by external consultants, and send the list of approved projects to the MRDT for funding, since they don't have own budgets). This limited capacity of intervention comes from the way they have been designed to function: as NGOs that work on the basis of service contracts concluded with MRDT, without policy or strategy role. They have no innovation competences.

This gap in regional policy design, implementation, evaluation, etc. is unlikely to be filled in the current governance mode and interest for innovation. Moreover, given the pressure for increasing the SF absorption rate, the current focus is mainly on contracting rather than on policy, evaluation or coordination.

At the implementation level, there are also several difficulties of different kinds:

a) *At the level of the allocation system:* insufficient and poorly financially motivated human resources dealing with increasing work volumes, delays in the provision of Application Guidelines and contracting of external technical expertise, inability to fill the available vacant positions which were frozen in 2009 due to the economic crisis. Measures to correct these deficiencies included internal redistribution of personnel, increased outsourcing of activities and the acquisition of external consultancy services for project

evaluation purposes, but the effectiveness of such measures remained very limited due to the uneven expertise of evaluators and an immature domestic consultancy market.

b) *At the level of private beneficiaries, especially SMEs:* high difficulty in preparing and submitting project proposals in a correct and timely manner, poor capacity of beneficiaries to co-finance the project, which was further weakened by the effects of the economic crisis (slowdown of firm activities, large variations in the exchange rate), limited availability of bank loans and requirements such as pre-financing bank guarantee letters, etc., which led to cancellation of many projects after selection. Reductions of the check-up and evaluation phases have been applied, but led to an increase of the contracting time. The pre-financing share was raised to 35% also for beneficiaries under the state aid rules, which facilitated the start of project implementation by private beneficiaries. To facilitate the beneficiary's contribution to the project co-financing, the provision of bank credentials was simplified, e.g. by submission of a bank guarantee letter only in the contracting phase, with a bank agreement to provide funding being sufficient at project submission.

c) *At the level of public beneficiaries:* limited capacity and expertise of central and local public administration to prepare and implement projects, lack of strategic planning and correct project budgeting, weak competencies in project management and public procurement, which led to large numbers of contested public procurement procedures, etc. All these factors introduced significant delays in the implementation of over 90% of the signed contracts. The economic crisis further amplified the implementation delays by determining the inability, in the case of many beneficiaries to ensure the necessary project cash flow. In order to accelerate the public procurement process, the public procurement law was modified in 2009 by introducing a fast track procurement procedure, but serious difficulties still remain. Also, public beneficiaries have been requested to include in the own budget the sums necessary for project implementation.

d) *At the level of external factors:* the economic crisis and a difficult international environment, uneven quality and insufficient availability of consultancy services on the domestic market, overestimation of both public and private beneficiaries' capacity to implement the projects, financially and competence-wise.

Under the cumulated effect of these factors, the question has been raised of whether the 2007-2015 targets can still be successfully achieved. Although in the majority of cases, the probability of realising these targets remains medium or high, reserved estimates have been expressed for some operations under SOP IEC PA1 (KIA 1.2 and KIA 1.3, which in an uncertain situation), and for some indicators of SOP IEC PA2 (e.g. 'New R&D jobs created', 'Jobs created/maintained in assisted beneficiaries', 'Patent applications resulting from assisted projects'), which may not be met, taking

into account that most beneficiaries belong to the public sector that is heavily affected by budget cuts (Ministry of Economy, Trade and Business Environment, 2010).

Financial information regarding the implementation of the two OPs supporting innovation measures is summarised in Exhibit 3 below:

Exhibit 3 - Financial information on the implementation of SOP IEC and ROP

ERDF contribution	Payments made by beneficiaries and claimed for reimbursement by the Management Authority	Public contribution	Payments made by the unit in charge with payment to beneficiaries	Total payments received from the Commission
SOP IEC PA1	125.357.034,75[17]	29.216.106,12[18]	101.642.363,61[19]	87.029.410,39[20]
SOP IEC PA2	6.053.086,10	6.050.448,43	125.070,12	35.054,4
SOP IEC PA3	1.150.530,05	976.102,42	72.711,74	28.846,09
ROP PA4	6.999.705,24	4.781.530,38	4.781.530,38	537.334,30

Source: Ministry of Economy, Trade and Business Environment (2010) for SOP IEC, and Ministry of Regional Development and Tourism (2010) for ROP.

A more detailed discussion of the implementation progress of the two OPs promoting innovation measures is provided below by policy area.

INNOVATION-FRIENDLY ENVIRONMENT POLICY AREA

a) SOP IEC PA1: An innovative and eco-efficient productive system

Progress indicators regarding the implementation of this PA are recorded only from 2009 and have relatively low values, determined by a variety of factors, as discussed in the introduction of this section. The regional distribution of contracts signed under this PA is relatively balanced, with the most contracts in the Centre (122), followed by North East (119), North West (111), Bucharest Ilfov (90), South (81), South West (78), South East (76), and West (43).

- **KIA 1.1 - Productive investments and preparation for market competition of enterprises, especially SMEs:** Contracts under O 1.3.2-Consultancy support for SMEs are currently verified by the European Anti-Fraud Office (OLAF). The operation is planned to be re-launched in 2010, after introducing some changes in the Application Guidelines to prevent fraud.

[17] Of which EUR 100,000,000 for KIA 1.2 "SMEs access to financing" – Jeremie (2008)

[18] Of which EUR 14,000,000 for KIA 1.2 "SMEs access to financing" – Jeremie (2008)

[19] Of which EUR 100,000,000 for KIA 1.2 "SMES access to financing" – Jeremie (2008)

[20] Of which EUR 86,000,000 for KIA 1.2 "SMEs access to financing" – Jeremie

- ***KIA 1.2 – SMEs' access to financing****:* the progress of the *JEREMIE Fund for Romania*, which promotes access to finance for (primarily) micro- to medium enterprises has been difficult and both the Guarantee Fund (budget EUR 65 million) and the Risk Capital Fund (budget EUR 35million) are not functional yet. JEREMIE was considered by the Romanian authorities as a useful instrument to alleviate the effects of the financial crisis by providing capital for SMEs, at a time when bank lending to the economy, was shrinking. However, the complexity and novelty of this instrument, combining financial instruments with SF rules and constraints, correlated with significant delays of EC in confirming the compatibility of proposed products with SF rules, have prevented the effective launch of this instrument in 2009, missing the opportunity to act early on as a factor against the crisis. Under these circumstances, Romanian authorities are reserved with regard to possible extensions of JEREMIE and use of other similar financial instruments (Government of Romania, 2010).

- **KIA 1.3 – Sustainable development of entrepreneurship**: *O 1.3.1 – Development of business support structures of national and international interest (competitiveness poles)* is expected to be relaunched in 2010 after corrections of deficiencies in the preparation of Call for proposals documents for consultancy services.

b) SOP IEC PA 3: ICT for private and public sectors

A relatively high success rate (46%) can be noted here, which reflects the good quality of projects focusing on the ICT use. By proposer, projects submitted by SMEs were generally of a better quality than those submitted by NGOs under *O 3.1.1 – Supporting access to Internet and connected services'*. Also, under *KIA 3.2 Development and higher efficiency of modern public e-services* the funding requested by the central public administration was approved 100%, due to better quality of the projects prepared by contracted external consultants, while the funding requested by the local public administration (libraries, Intra-community Development Associations, etc.) was much lower. In most operations, the regional distribution of projects was concentrated in the capital region Bucharest-Ilfov, as the entire central administration is located in Bucharest (however, project results are not limited to the capital, since the final beneficiaries of these e-applications are located throughout the country).

c) ROP PA 4: Strengthening regional and local business environment

- ***KIA4.1: Sustainable development of business support structures of regional and local importance***:: had a low response rate (only 6% of the total value budget for 2007-2013 contracted by 31 December 2009) due to the lack of motivation of local public authorities in submitting project proposals, which, in turn, is determined by the state aid restrictions applicable to these business support structures, the high co-financing share of the projects (up to 50% of eligible expenses), unclear ownership provisions on the land and building(s) of a business structure, lack of clear regulations regarding public-private partnerships. An attempt to clarify these aspects has

been made by promoting a law project regarding public-private partnerships that is currently under debate in the Parliament (based on Ministry of Regional Development and Tourism, 2010). The regional distribution of projects under this KIA shows the Centre Region with 43% of the ERDF resources, North East with 10% and South East with 1%, while the other regions have no contracts.

- ***KIA 4.3: Support the development of micro-enterprises:*** low response rate (21.2% of the ROP target of supported micro-enterprises contracted by 31 December 2009), uneven distribution of contracts by development region, ranging from one contract in the South East Region to 12 contracts in West Region and 11 in North East. By field, the distribution of these contracts is concentrated in the medical field (20 projects), with a predominance of dental practice offices and medical tests laboratories. Implementation was hindered by a high rejection rate of project proposals and a high number of contract cancellations (50 contracts cancelled by 31 December 2009), either due to the contract beneficiaries' failure to provide co-financing, in the context of the economic crisis, or at the request of the Management Authority/Intermediary Body for irregularities in the contract implementation. In order to support the contract beneficiaries, the ROP Management Authority proposed to increase the ERDF co-financing to 100% for eligible expenses, so that beneficiaries bear only the non-eligible project expenses.

BOOSTING APPLIED RESEARCH AND PRODUCT DEVELOPMENT POLICY AREA

The most relevant developments for this policy area discussed here are related to **SOP IEC PA2: RTDI for competitiveness**[21]**,** which is characterised by a high success rate of funding, ranging from 23% to 93% by operation. The high success rate can be largely attributed to two factors:

- The 2005 creation by NASR of the *Intermediate Body (IB) for RDI* as a general directorate within this institution, and representative offices in each of the eight development regions, located within universities and/or research institutes, in charge with the preparation, selection and coordination of projects to be funded through PA2.

- The preparation of a portfolio of projects supporting the development of R&D activities and infrastructures, especially at regional level, that was undertaken in the context of the *National Programme IMPACT*, which was launched in 2006 to support the absorption of RDI SF. Until the end of IMPACT in 2008, approx. 1,000 feasibility studies, business plans and other types of economic analyses were financed and have later become project proposals for PA2 competitions. The regional distribution of projects submitted shows a leading position of the capital region Bucharest-Ilfov (48% of total), due to the fact that most public research institutions are located in

[21] Complete lists of projects selected for funding under each operation of this PA in 2007, 2008 and 2009 are available on the NASR website http://www.mct.ro/index.php?action=view&idcat=378.The calendar of operations still to be launched under this PA (as per 30 June 2010) is available at http://amposcce.minind.ro/fonduri_structurale/Calendar_lansari_POS_CCE_30_iunie_2010.pdf.

this region. The North-East and North-West regions also have higher shares of projects submitted, as here are some of the most important universities of the country.

An analysis of operations under PA2 highlights important features of the competition for ERDF-funding for innovation:

(i) A high interest of the scientific community for public research infrastructures, and lower interest for projects aiming to improve the administrative and project management capacity;

(ii) A high interest of the scientific community for complex R&D projects involving foreign specialists, reflecting the stronger external outlook, international collaborations and networking of the scientific community, in contrast to the relatively low interest of enterprises for joint R&D projects in partnerships. This low interest can be attributed to some extent to the effects of the economic downturn, which obliged many enterprises to adopt a survival rather than a collaboration strategy, but a more likely explanation is their poor internal R&D capacity, especially in large enterprises (see the discussion on the differences in the innovative capacity of large firms and SMEs on pp.14-15). In addition, the difficulty to provide a contribution to the project (up to 75%, apart from non-eligible expenses) and some restrictions on eligible expenses, contributed to a low response rate from enterprises.

(iii) A low response rate in the funding of innovative spin-offs and start-ups mainly because of the scarcity of innovative ideas and difficulty to ensure funding at the start phase and subsequent operations of the firm. These results highlight again the poor innovative capacity of Romanian firms and the difficulty to access Structural Funds for RDI in the absence of support structures facilitating access to capital to cover the beneficiary' s contribution to the project.

KNOWLEDGE TRANSFER AND SUPPORT TO INNOVATION POLES AND CLUSTERS POLICY AREA

This policy area is addressed by SOP IEC PA2: RTDI for Competitiveness and ROP PA4: Strengthening regional and local business environment, which have been discussed above.

EXAMPLES OF PROJECTS SUPPORTED BY ERDF FUNDING FOR INNOVATION

As at this stage it is too early to talk about successful implementation, these examples have been selected primarily on the basis of their potential longer term positive implications for innovation:

- ***"Implementation of e-administration in Sibiu City"*** (SOP IEC, PA3, KIA 3.2: Developing and increasing the efficiency of electronic public services): this 24-month project, whose beneficiary is Sibiu City Council, has a budget of EUR 500,000 (1 EUR = 4.2 RON exchange rate), of which 97% is non-reimbursable funding provided by ERDF and 3% is the contribution of the Sibiu City Council to the eligible expenditure. The projected is expected to significantly improve public services and simplify bureaucracy, by introducing basic e-services such as: payments by physical and legal persons to various state budgets (tax, social security, unemployment, health insurance); provision

of authorizations and certificates, company registration in the trade registry, provision of services related to the Population Registry, Car Registry, filing of complaints, etc.[22]

- ***Two new industrial parks in Cluj County*** (ROP): this project provides funding for two new industrial parks: one offering logistical support to SMEs (stretching over approx. 100 ha) and the other producing electrical energy by solar panels (approx. 85 ha). The first industrial park amounts to approx. EUR 11 million, of which 50% will be provided by the ROP, while the second amounts to approx. EUR 50 million, to be obtained through several partnerships with foreign investors. Cluj County has another three industrial parks, two of which host production units of foreign firms such as Nokia and Emerson[23].

- ***Web Portal for online processing of statistical data for the National Institute of Statistics*** (SOP IEC, PA3: ICT for public and private sectors): This EUR 6.3 million project for the National Institute for Statistics will provide a web portal for online processing and retrieval of statistical data, thus improving access to public information for citizens, firms and public institutions. The online portal will be tested for 20 surveys and statistical research and will be expanded to 200 within five years. Upon completion of the project in fall 2010, INS will be able to collect online survey statistics performed by firms and administrative units[24].

4 CONCLUSION: MAIN CHALLENGES FACED BY COHESION POLICY PROGRAMMES

- *Contribution of the ERDF to innovation policy*

ERDF contributes to innovation policy through two OPs:

(i) SOP IEC, which accounts for the largest share of ERDF funding (50.3%) and addresses innovation objectives in PA1: An innovative and eco-efficient productive system, PA2: RTDI for Competitiveness, and PA3: ICT for private and public sectors); and

(ii) ROP, which accounts for only 3% of ERDF funding and addresses innovation objectives in PA4: Strengthening regional and local business environment (especially SMEs, micro-enterprises).

Overall, ERDF resources for innovation account for only 9% of the total ERDF funding. The global absorption rate of ERDF since 2007 until the end of 2009 was rather low, at only 10.3%, but this level appears to be within normal limits for this stage of the implementation cycle, when compared to other EU Member States (Government of Romania 2010).

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[22] Source: http://www.eufinantare.info/exemple-de-succes/implementarea-conceptului-administratie-electronica-sibiu.html

[23] Source: http://www.administratie.ro/articol.php?id=31329

[24] Source: http://www.zf.ro/fonduri-ue/exclusiv-online-pentru-ce-ia-institutul-national-de-statistica-4-milioane-de-euro-de-la-ue-6093409/.

- *Main achievements so far and results from ERDF co-financed programmes*

The main achievement so far can therefore be considered to be the implementation of mechanisms by which the ERDF funds are being distributed, although their functionality is often hindered by a wide range of problems at several levels: the governance system, the OP implementation system, the weak capacity of public and private beneficiaries, especially SMEs, public beneficiaries to provide good quality proposals in a timely manner and ensure their co-financing part, and external factors, especially related to the economic crisis. Some corrective measures have been taken to correct these deficiencies, but they seem to be insufficient and only modestly effective. Evidence on the way ERDF funds for innovation are absorbed at the regional level is limited to regional counts of projects submitted and contracted. No policy criteria apply to funding allocation, because of a gap in the institutional design and policy concern of the institutions coordinating SOP IEC and ROP: NASR, who is in charge of innovation, has no regional oversight, and MRDT, who has regional oversight through coordination of the RDAs, has no innovation competences. RDAs, who have the bulk of regional information, have only an administrative role and no policy or strategy capacity, and serve as a facilitator of the interaction between local players, foreign investors and central authorities.

- *Follow-up of the innovation policy and appropriateness of ERDF support in the regions*

Romania has no formal regional innovation policies designed by the national policy-making bodies (NASR). The Regional Innovation Strategies (RIS) are only an incipient regional innovation policy instrument that emerged in recent years under the RDAs' coordination, but they are poorly related among themselves and with the national RDI policy.

- *Main challenges which need to be overcome in the future for policy to be effective*

The lack of regional innovation policies, as well as of a national innovation strategy, the institutional and policy gap in monitoring regional innovation developments, combined with multiple structural, technical and management deficiencies and insufficient corrective actions creates a 'vicious circle' of under-achievement and low absorption of ERDF funds that is not likely to be fixed in the near future and in the current governance mode that attaches little importance to innovation. Although the SOP IEC and ROP are an important source of funding for innovation in the context of drastic cuts in the public RDI resources and diminishing resources of the business, the existing evidence suggests that these funds are managed in a passive way, focused strictly on administrative criteria. The main challenges that need to be overcome in the future for innovation policy to be effective focus on several levels:

  - *At the level of the governance system:* a change of vision of policy-makers on the role and importance of innovation is necessary, as well as on their role in this process, from passive distributors of funds to active coordinators guided by relevant policy criteria, reflecting regional and national needs. NASR needs stronger authority in the horizontal integration of RDI objectives

in other ministries' strategies and policies, and a stronger policy support to achieve that. NASR also needs to review the current thinking about the lack of a regional innovation policy, strengthen its regional outreach and collaboration with the RDAs and other regional authorities, and ensure effective linkages between the national RDI Strategy and policy instruments and the RIS, as well as other existing national strategies. The NGO status of the RDAs and their limited role in managing the regional use of ERDF funds needs to be rethought for more effective results. The RDAs also need to improve the communication with central structures, the use of regional resources, both human and financial, improve the capacity for strategic planning, the design of inter- and intra-regional collaboration projects and mobility schemes, increase the role of local universities in regional innovation as nuclei of knowledge and expertise at the service of the broader community.

- *At the level of the OP implementation system*: improve the project management capacity of administrators through training courses, workshops, learning from the experience of OP administrators in more advanced countries, etc.

- *At the level of both public and private beneficiaries, especially SMEs:* improve the capacity to prepare and manage projects, by organizing training/teaching courses for potential beneficiaries and also for the consultants on the domestic market, by involving local university academics and researchers who have been successful in accessing ERDF funds for innovation.

- *Other factors*: increase the awareness on the funding opportunities provided by the OPs and the application conditions, stimulate the development of financial markets and of specific instruments for funding innovation projects, stimulate the cooperation between firms and the scientific community.

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LIST OF INTERVIEWS

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Ms. Daniela Gheorghian, Counsellor, Directorate Implementation of SOP IEC, National Authority for Scientific Research

Mr. Gabriel Friptu, Director of the Management Authority of the ROP, Ministry of Regional Development and Tourism

Ms. Iuliana Topoleanu, Evaluation-examination expert, Directorate Strategies and Programme Coordination, Ministry of Regional Development and Tourism

Mr. Vlad Athanasiu, CEO Newtron Trading Co. Ltd., participant in a project funded by ERDF.

ANNEX A – BACKGROUND DATA ON EU COHESION POLICY SUPPORT TO INNOVATION

Table 1- Total ERDF resources allocated per programme (2007-2013)

Programme	Total ERDF resources for innovation	Total ERDF	Innovation support as % of total ERDF	Main innovation initiatives implemented (Priority Axis/Key intervention area)
Regional Operational Programme	113,364,211	3,726,021,762	3.0%	*PA4. Strengthening the regional and local business environment* Development of sustainable regional and local business support structures; to attract enterprises, mainly SMEs; Rehabilitation of unused polluted industrial sites and preparation for new activities; Support the development of micro-enterprises (procurement of equipment and modern production technologies, services, constructions; procurement of IT systems; use of new technologies; relocation of micro-enterprises in business structures; rehabilitation);
SOP Increase of Economic Competitiveness	1,285,887,460	2,554,222,109	50.3%	*PA1. An innovative and eco-efficient productive system* Productive investment and preparation for market competition of enterprises, especially SMEs; SMEs' access to funding; Development of sustainable entrepreneurship *PA2. Research, Technological Development and Innovation for*

				competitiveness R&D partnerships between universities, R&D institutes and enterprises, for producing results transferrable to the economy Investment for RDI infrastructure; 2.3 Enterprises' access to RDI activities, especially SMEs. *PA3. ICT for private and public sectors* 3.1.Sustaining the use of ICT; Developing effective public e-services; Developing the e-economy
SOP Transport		4,565,937,295	0.0%	
SOP Environment		4,512,470,138	0.0%	
OP Programme Technical Assistance		170,237,790	0.0%	
Total Objective 1	1,399,251,671	15,528,889,094	9.0%	
Overall total	1,399,251,671	15,528,889,094	9.0%	

* The term initiatives is understood in a wide sense covering measures, projects, actions and so on co-financed by the ERDF.

Source: core team on EC data.

Table 2 – ERDF contribution to innovation by policy area (2007-2013)

Policy Area	Categorisation of Expenditure (FOI codes)	Total ERDF
Objective 1		
Assistance to SMEs for the promotion of environmentally-friendly products and production processes (...)	06	125,747,737
Investment in firms directly linked to research and innovation (...)	07	131,416,964
Other measures to stimulate research and innovation and entrepreneurship in SMEs	09	152,220,847
R&TD activities in research centres	01	75,095,316
Boosting applied research Total		484,480,864
Advanced support services for firms and groups of firms	05	218,584,206
Developing human potential in the field of research and innovation, in particular through post-graduate studies ...	74	
Information and communication technologies (...)	11	10,004,368
Information and communication technologies (TEN-ICT)	12	
Other measures for improving access to and efficient use of ICT by SMEs	15	75,993,517
Services and applications for citizens (e-health, e-government, e-learning, e-inclusion, etc.)	13	153,268,047
Services and applications for SMEs (e-commerce, education and training, networking, etc.)	14	114,951,028
Innovation friendly environment Total		572,801,166
Assistance to R&TD, particularly in SMEs (including access to R&TD services in research centres)	04	37,547,704
R&TD infrastructure and centres of competence in a specific technology	02	241,377,573

Technology transfer and improvement of cooperation networks ...	03	63,044,364
Knowledge transfers and poles Total		341,969,641
Total Objective 1		1,399,251,671

Table 3 - Coverage of policy areas by Operational Programmes/Priority Axes

Policy area	Categorisation of expenditure (corresponding FOI codes)	Operational Programme (OP) /Priority Axis (PA)
Innovation friendly environment	05	SOP IEC PA1 An innovative and eco-efficient productive system
		SOP IEC PA2 RTDI for competitiveness
		ROP PA4 Strengthening regional and local business environment
	11	SOP IEC PA3 ICT for private and public sectors
	12	SOP IEC PA3 ICT for private and public sectors
	13	SOP IEC PA3 ICT for private and public sectors
	14	SOP IEC PA3 ICT for private and public sectors
	15	SOP IEC PA3 ICT for private and public sectors
		ROP PA4 Strengthening regional and local business environment
	74	SOP IEC PA2 RTDI for competitiveness
Knowledge transfer and support to innovation poles and clusters	02	SOP IEC PA2 RTDI for competitiveness
	03	ROP PA4 Strengthening regional and local business environment
		SOP IEC PA2 RTDI for competitiveness
	04	SOP IEC PA2 RTDI for competitiveness
Boosting applied research and product development	01	SOP IEC PA2 RTDI for competitiveness
	06	SOP IEC PA2 RTDI for competitiveness
	07	SOP IEC PA2 RTDI for competitiveness
	09	SOP IEC PA2 RTDI for competitiveness

Note: SOP IEC = Operational Programme Increasing Economic Competitiveness; ROP = Operational Programme Regional Development

Table 4 - Operational Programmes under the Convergence Objective

Operational Programme	Total budget (EUR billion)	EU assistance (EUR billion)	% of total EU funds	Managing Authority	SF
1. Transport	5.7	4.565	23.8%	Ministry of Transport and Infrastructure	ERDF + CF
2. Environment	5.6	4.512	23.5%	Ministry of Environment and Forests	ERDF + CF
3. Regional Development	4.38	3.726	19.3%	Ministry of Regional Development and Tourism	ERDF
4. Human Resources Development	4.1	3.476	18.1%	Ministry of Labour, Family and Equal Opportunities	ESF
5. Increasing Economic Competitiveness	3	2.554	13.3%	Ministry of Economy, Trade and Business Environment	ERDF
6. Administrative Capacity	0.246	0.208	1.1%	Ministry of Home Affairs	ESF

7. Technical Assistance	0. 213	0.170	0.86%	Ministry of Economy, Trade and Business Environment	ERDF

Table 5 – Distribution of Structural Funds sources by Convergence Operational Programmes

ERDF (EUR)		ESF (EUR)		ERDF + Cohesion Fund (EUR)	
Regional Development	3 726 021 762	Human Resources Development	3 476 144 996	Environment ERDF CF ERDF+CF	 1 236 652 195 3 275 817 943 4 512 470 138
Increasing Economic Competitiveness	2 554 222 109	Administrative Capacity	208 002 622	Transport ERDF CF ERDF+CF	 1 289 332 210 3 276 605 085 4 565 937 295
Technical Assistance	170 237 790				
TOTAL ERDF: 8 976 466 066 Total ESF: 3 684 147 618 Total CF: 6 552 423 028					

Table 6 – Operational Programmes under the Territorial Cooperation Objective

Operational Programme	Total budget (EUR billion)	EU assistance (EUR billion)	% of total EU funds	Managing Authority	SF
8-13. European Territorial Cooperation OPs: *Cross-border Cooperation OPs*: 'Romania-Bulgaria' 'Hungary - Romania' *Trans-national Cooperation OP:* *'*South East Europe' *(SEE)* *Inter-regional cooperation OPs:* OP INTERREG IVC OP URBACT OP INTERACT OP ESPON	 0.262 0.275 0.245 n.a. n.a. n.a. n.a.	 0.218 0.224 0.206 n.a. n.a. n.a. n.a.	 2.5 2.6 2.4 n.a. n.a. n.a. n.a	Ministry of Regional Development and Tourism	ERDF

ANNEX B – CLASSIFICATION OF INNOVATION POLICY AREAS, INSTRUMENTS AND BENEFICIARIES

Policy area	Short description
Innovation friendly environment	This category covers a range of actions which seek to improve the overall environment in which enterprises innovate, and notably three sub groups: • innovation financing (in terms of establishing financial engineering schemes, etc.); • regulatory improvements and innovative approaches to public services and procurement (this category could notably capture certain e-government investments related to provision of services

	to enterprises); • Developing human capital for the knowledge economy. This category will be limited to projects in higher education aimed at developing industry orientated courses and post-graduate courses; training of researchers in enterprises or research centres. The category also covers initiatives geared towards improving governance capacities for innovation and knowledge policies (e.g. specific technical assistance funding, support for regional foresight)
Knowledge transfer and support to innovation poles and clusters	Direct or indirect support for knowledge and technology transfer: • direct support: aid scheme for utilising technology-related services or for implementing technology transfer projects, notably environmentally friendly technologies and ITC; • indirect support: delivered through funding of infrastructure and services of technology parks, innovation centres, university liaison and transfer offices, etc. Direct or indirect support for creation of poles (involving public and non-profit organisations as well as enterprises) and clusters of companies • direct support: funding for enterprise level cluster activities, etc. • indirect support through funding for regrouping R&D infrastructure in poles, infrastructure for clusters, etc.
Boosting applied research and product development	Funding of "Pre-competitive development" and "Industrial research" projects and related infrastructure. Policy instruments include: • aid schemes for single beneficiary or groups of beneficiaries (including IPR protection and exploitation); • research infrastructures for non-profit/public organisations and higher education sector directly related to universities. Any direct or indirect support for the creation of innovative enterprises (spin-offs and start-ups)

Instruments	**Short description**
Infrastructures and facilities	Building and equipment for laboratories or facilities for university or research centres, Telecommunication infrastructures, Building and equipment for incubators and parks for innovative enterprises
Aid schemes	Grants and loans for RTDI projects Innovative finance (venture capital, equity finance, special bonds, etc.) for innovative enterprises
Education and training	Graduate and post-graduate University courses Training of researchers

Beneficiaries	**Short description**
Public sectors	Universities, National research institutions and other national and local public bodies (innovation agencies, BIC, Chambers of Commerce, etc.), Public companies
Private sectors	Enterprises Private research centres
Others	NGOs
Networks	cooperation between research, universities and businesses cooperation between businesses (clusters of SMEs) other forms of cooperation among different actors

ANNEX C - CATEGORISATION OF EXPENDITURE TO BE USED FOR CALCULATING EU COHESION POLICY RESOURCES DEVOTED TO INNOVATION

FOI Code	Priority Theme
	Research and technological development (RTD), innovation and entrepreneurship

01	R&TD activities in research centres
02	R&TD infrastructure (including physical plant, instrumentation and high-speed computer networks linking research centres) and centres of competence in a specific technology
03	Technology transfer and improvement of cooperation networks between small businesses (SMEs), between these and other businesses and universities, postsecondary education establishments of all kinds, regional authorities, research centres and scientific and technological poles (scientific and technological parks, technopoles, etc.)
04	Assistance to R&TD, particularly in SMEs (including access to R&TD services in research centres)
05	Advanced support services for firms and groups of firms
06	Assistance to SMEs for the promotion of environmentally-friendly products and production processes (introduction of effective environment managing system, adoption and use of pollution prevention technologies, integration of clean technologies into firm production)
07	Investment in firms directly linked to research and innovation (innovative technologies, establishment of new firms by universities, existing R&TD centres and firms, etc.)
09	Other measures to stimulate research and innovation and entrepreneurship in SMEs
	Information society
11	Information and communication technologies (access, security, interoperability, risk-prevention, research, innovation, e-content, etc.)
12	Information and communication technologies (TEN-ICT)
13	Services and applications for the citizen (e-health, e-government, e-learning, e-inclusion, etc.)
14	Services and applications for SMEs (e-commerce, education and training, networking, etc.)
15	Other measures for improving access to and efficient use of ICT by SMEs
	Human capital
74	Developing human potential in the field of research and innovation, in particular through post-graduate studies and training of researchers, and networking activities between universities, research centres and businesses

ANNEX D - REGIONAL KNOWLEDGE ECONOMY PROFILES IN ROMANIA

A recent MERIT study on regional knowledge economies in the EU based on 2002-2003 EUROSTAT data (see Rogin, 2006) captures very well the large gaps between the Capital region and the rest of the country and divides the eight Romanian regions into two distinct clusters based on four specific factors[25]:

- ***The "Aging Academia" cluster***, which included the Capital Region Bucharest-Ilfov, based on its distinctive features compared to the other Romanian regions. In the same cluster one

[25] Based on a cluster analysis of four factors:

- Public Knowledge (F1): The most important or common variables in this factor are human resources in S&T combined with public R&D expenditures and employment in knowledge-intensive services. Regions with large universities will rank high on this factor.
- Urban Services (F2): The most important variables for this factor are value-added share of services, employment in government administrations and population density. A key observation is that academic centres do not necessary co-locate with administration centres.
- Private Technology (F3): This factor is most strongly influenced by business R&D, occupation in S&T activities, and employment in high- and medium-high tech manufacturing industries.
- Learning Families (F4): The most important variable in this factor is the share of the population below the age of 10. The Learning Families factor could also be interpreted as an institutional factor indicating a child-, learning- and participation- friendly environment, or even a 'knowledge-society-life-style' based on behavioural norms and values that are beneficial to a knowledge economy (Rogin, 2006, p. 7)

could also find some East-Germany and Spain regions and also Sofia, the capital of Bulgaria. This cluster is characterised by a strong Public Knowledge factor, which is mostly based on the high share of people with tertiary education, and a low score on the Learning Family factor, due to little lifelong learning and hosting relatively few children.

- ***The "Rural industries" cluster***, which included the other seven Romanian regions, based on their low GDP per capita, low scores on both Urban Services and Private Technology factors, low Population density, small service sector, and large agriculture and manufacturing industries.

In a more fine-grained classification of European regions, the same study places the eight Romanian development regions into four categories (of the 11 categories identified in the study):

- ***Capital Region: Bucharest-Ilfov***
- ***Leading Knowledge Regions: West and North-West***
- ***Industrial Region: Centre***
- ***Lagging Behind Regions: South, South-East, South West and North-East***

Capital Region (Bucharest-Ilfov)	Leads in all key knowledge economy indicators. It contributed 21% to the national GDP in 2002 and attracted 53% of FDI flows in Romania until 2003. Hosts more than double of SMEs in per capita. The regional economy is dominated by the service sector, which accounted for 66.4 % in 2004. It is the most important industrial agglomeration in Romania. The industrial restructuring resulted in a migration of the labour force over 1995-2003 to the services sector. A key feature of the region is the high development of the ICT and financial sector, with one IT cluster created by grouping several IT firms. The human capital is generally well qualified. Bucharest is the largest University Centre in Romania, supplying an important number of S&E graduates. The capital region hosts about 40% of the R&D institutions and 51% of R&D personnel in Romania (National Institute of Statistics, 2004). It has a low level of unemployment. The poor performance in the "Learning Families" can be explained by a lower percentage of young population compared with the other regions.
Leading Knowledge Regions: West and North West Regions	Include the West and North West Regions, which have a relatively good innovation and knowledge potential and a more dynamic economic sector than the five remaining regions. Regional contributions to national GDP in 2002 were12% for the North West and 10% for the West Region. Moreover, the North West regional indicator has improved since 2004 when high FDI-driven growth in Cluj County started to boost the regional economy. After Bucharest-Ilfov, the West Region is leading in terms of attracting FDI. The North-West Region has increased the rate of attracting FDI over the past three years. The number of SMEs per capita is above the Romanian average in both regions and the value of this indicator has increased over the period 1998-2003. The economic structure of these two regional economies is dominated by Machinery and Electrical equipments; Chemical industry; Wood and furniture industry; ICT; Food industry and Textile industry. Steel industry is present in the West Region in the less developed counties. However, the service sector provides a higher contribution to regional GDP than the industrial sector. The population engaged in agriculture is higher in the North West than in the West Region. Besides Bucharest, Cluj-Napoca and Timisoara are the main university centres in Romania and the major knowledge cities in North-West and West Regions, respectively. The regions are characterised by the 2nd largest graduates supply after Bucharest, with an important number of well-qualified S&E graduates, particularly from the Timisoara and Cluj university centres. This group of regions has an important number of research institutions and very good quality of human capital. While the collaboration between academia and business works well in Cluj-Napoca and Timisoara with foreign companies, the same does not apply for domestic SMEs. Both Timisoara and Cluj-Napoca University towns are currently hosting IT clusters, and a solar energy cluster is about to be created in Cluj-Napoca. In terms of innovation and

	knowledge infrastructure, the regions lag behind Bucharest in terms of Business Incubators and S&T Parks. While the number of industrial parks increased, S&T Parks are in an incipient phase. This group has a relatively high potential for R&D and innovation in the Romanian context.
Industrial Region – Centre Region	Is characterised by a complex industrial structure, a regional industrial tradition and qualified labour force in industry. Moreover, FDI is one of the main factors of the regional development. The region had the highest contribution (13%) to the national GDP in 2002 after Bucharest-Ilfov, and contributed in the same extent to the GDP per capita. In 2000 it ranked 3rd in terms of FDI per capita after Bucharest-Ilfov and the West Region. The SMEs per head indicator is above the Romanian average and presents a positive trend over the recent years. The majority of regional population works in industry and services. The main industrial regional branches are metal and machinery industry, chemical and pharmaceutical, aeronautical, construction materials, textile, wood and furniture, and food industry. The Centre Region has the highest number of industrial parks in Romania, created by the transformation of former industrial platforms into industrial parks and not by creation of new infrastructures. The main difference between the Centre Region and the Leading Knowledge Regions is the lack of prestigious university centres, with the exception of a good University of Medicine and Pharmacy in Targu Mures and a well-known Forestry Faculty and Technical Faculty in Brasov, The lower supply of S&E graduates causes a limited potential for R&D and innovation in the region.
Lagging Behind Regions: South, South-East, South West and North-East Regions	Are characterised by a high proportion of the active population working in agriculture and a low SME per capita indicator. The regional contribution to the national GDP in 2002 ranged between 9% in the South West and 12% in the South and North-East Regions, with an 11% contribution of the South-East. The GDP per capita values in 2002 reflect the lower development of these regions compared to those discussed above. The GDP per capita was only 9% in the North-East Region and 10% in the other remaining three regions in this group, and the trend persisted over the recent years. In 2004, the industrial production recorded higher growth rates in the South and South-West regions compared to the other regions. Nevertheless, important FDI investment is concentrated in a small number of cities such as Constanta, Pitesti and Craiova. The lower entrepreneurship spirit of those regions is explained by a low percentage of SMEs per head, which is the lowest in the North-East Region (In 2003, 65.9% of the average in Romania). The South and South-West regions are relatively similar with around 70% of SMEs per head of the Romanian average. The South East region leads concerning this indicator but with only 94.2 % of the Romanian average. Another feature also is the negative trend regarding SMEs per head in this group of regions. Although agriculture accounts for an important share of the regional economy, industry has also an important role in various cities. However, the economic profile varies across the regions of this group. The North-East region is characterised by the presence of manufacturing industries, such as furniture, wood, textile and machinery. In addition, Iasi, the main city of the region, hosts the fourth largest university centre in Romania, after Bucharest, Cluj-Napoca and Timisoara, which ensures a good supply of S&E graduates. The South-East region is characterised by heavy industry, which managed to stop its decline due to large FDI inflows, wood, textile industry and oil processing, with a positive impact on the regional economy. In addition, the South-East Region also has an important tourism sector, particularly on the Black Sea Coast. The South region is divided between the Industrialised North and the South, which includes the poorest counties in Romania. The Northern part of this region is characterised by the chemical and oil industries, as well as machinery and equipments, construction materials, textile and food industry. The industrial poles of the region are concentrated in Ploiesti, Pitesti and Târgoviste cities. In the South-West region the industrial poles are located in Craiova, and the main regional industry is represented by machinery, chemical and energy production.

Source: Rogin (2006), pp. 10-12

Table 1 – Total R&D expenditure at regional level 2002-2007 (ROL million for 2002-2003, RON thousand for 2004-2007, 1 EUR=4.2 RON)

Region	2002	2003	2004	2005	2006	2007
North West	386870	365767	32508	88971	116664	267714
Centre	384827	507564	46330	53172	60920	74256
North East	290469	374904	50439	65326	107503	163561
South East	263825	264593	30396	42504	54303	80630

Bucharest Ilfov	3027263	4369025	559300	701683	957267	1486054
South Muntenia	908847	1060481	134476	134192	145750	231770
South West Oltenia	215984	213065	53893	45023	53961	67793
West	265776	465247	45530	52788	69434	111583

Source: Statistical Yearbook of Romania 2008, National Institute of Statistics

Table 2 – R&D personnel by region

Region	2002	2003	2004	2005	2006	2007
North West	3183	2742	2302	2690	3484	6564
Centre	4280	3479	2508	2419	2865	2641
North East	3368	2926	3168	3704	3981	4156
South East	1934	1934	1922	1898	2081	2201
Bucharest Ilfov	16970	18590	20631	22050	21937	20360
South Muntenia	4016	4205	4080	3850	3794	4376
South West Oltenia	2757	2841	2799	2569	2491	2506
West	1925	3268	3315	1855	1587	2321

Source: Statistical Yearbook of Romania 2008, National Institute of Statistics

Table 3 – Distribution of R&D units by region (2003)

Region	No. of R&D Units	(%)
Total Romania	719	100.0
North West	73	10.0
Centre	80	11.0
North East	81	11.0
South East	34	5.0
Bucharest Ilfov	292	41.0
South Muntenia	67	9.0
South West Oltenia	40	6.0
West	52	7.0

Source: Statistical Yearbook of Romania 2004, National Institute of Statistics

Table 4 – Patent applications by region

Region	2002	2003	2004	2005	2006	2007
North West	109	89	130	106	99	83
Centre	72	48	101	77	62	62
North East	435	142	134	232	195	187
South East	96	49	75	72	93	83
Bucharest Ilfov	507	363	349	331	345	272
South Muntenia	103	83	98	94	62	55
South West Oltenia	65	65	69	56	47	56
West	90	42	40	64	62	69

Source: Statistical Yearbook of Romania 2008, National Institute of Statistics

Table 5 - Distribution of projects in the 2007-2013 National RDI Plan by development region

	NE	NW	W	SW	S	SE	Centre	Bucharest	TOTAL
Human resources*)									
2007	121	169	58	35	26	37	56	591	**1093**
2008	64	95	26	21	13	29	14	308	**570**
Capacities **)									
2007	18	22	9	6	5	4	9	81	**154**
2008	25	30	12	7	5	7	9	82	**177**
Ideas									
2007	72	96	22	11	1	10	26	198	**436**
2008	111	139	50	25	16	27	46	537	**851**
Partnerships									
2007	46	70	25	19	14	30	7	386	**587**
2008	44	83	24	27	22	17	17	533	**767**
Innovation									
2007	11	5	4	10	5	3	13	86	**137**
2008	12	7	6	8	4	3	10	98	**148**
TOTAL	**534**	**716**	**236**	**169**	**111**	**167**	**207**	**2900**	**4920**

*) Awards for publication not included.

**) Projects supporting Romania's representation in international RDI bodies not included.

Source: NASR 2008, p. 30

Table 6 - Distribution of complex R&D projects by development region

	NE	NW	W	SW	S	SE	Centre	Bucharest	TOTAL
1-ICT									
2007	7	11	2	1	1	1	1	48	**72**
2008	4	7	0	0	1	5	1	39	**58**
2- Energy									
2007	3	2	1	10	5	1	2	54	**78**
2008	3	4	7	8	1	1	0	38	**62**
3-Environment									
2007	3	8	3	2	1	3	1	73	**94**
2008	5	8	2	2	4	3	0	48	**72**
4-Health									
2007	2	17	8	5	1	1	1	52	**87**
2008	2	15	6	0	0	3	1	51	**76**
5-Agriculture, food safety and security									
2007	10	15	2	2	7	6	8	52	**102**
2008	12	15	3	3	4	12	2	27	**71**
6-Biotechnologies, biology and genetics									
2007	2	6	3	1	1	0	0	37	**50**
2008	4	2	4	1	0	3	1	35	**50**
7-Materials, processes and innovative									

products									
2007	13	16	3	2	4	3	2	99	**142**
2008	10	7	3	3	4	0	1	55	**83**
8-Space and security									
2007	1	2	1	1	1	1	2	51	**60**
2008	2	0	0	2	0	1	0	41	**46**
9-Socio-economic and humanistic research									
2007	3	5	1	1	1	1	1	54	**67**
2008	4	10	0	0	0	2	1	42	**59**
10-Basic sciences									
2007	0	1	0	2	0	0	0	12	**15**
2008	0	2	0	0	0	0	0	9	**11**
TOTAL 2007	**44**	**83**	**24**	**27**	**22**	**17**	**17**	**533**	**767**
TOTAL 2008	**46**	**70**	**25**	**19**	**14**	**30**	**7**	**386**	**587**
General total	**90**	**153**	**49**	**46**	**36**	**47**	**24**	**919**	**1354**

Source: NASR 2008, p. 31

Table 7 – Ranking of development regions by innovation level

Rank	Development region	Score
1.	Bucharest - Ilfov	72,49
2.	South-East	31,73
3.	North-West	29,56
4.	North-East	29,44
5.	Centre	28,90
6.	South	28,04
7.	West	26,05
8.	South-West	21,35

Source: http://www.roinno.ro/barometru/21.pdf

ANNEX E – OVERVIEW OF OPERATIONAL PROGRAMMES

a. OPERATIONAL PROGRAMMES UNDER THE CONVERGENCE OBJECTIVE

OPERATIONAL PROGRAMME 'TRANSPORT'

Priority Axis/Key intervention area	EU Contribution (EUR million)	National Public Contribution (EUR million)	Total Public Contribution (EUR million)
Modernization and development of TEN-T priority axes for a transport system integrated into EU transport networks 1.1. Modernization and development of road infrastructure along the TEN-T priority axes 1.2: Modernization and development of railway infrastructure along the TEN-T priority axes	2,878.00 (CF)	507.88	3,385.88

1.3. Modernization and development of water transport infrastructure along TEN-T priority axes			
Modernization and development of the national transport infrastructure outside the TEN-T priority axes for a sustainable national transport system Modernization and development of national road infrastructure Modernization and development of national railway infrastructure Modernization and development of river and maritime ports 2.4 Modernization and development of air transport infrastructure	756.17 (ERDF)	252.06	1,008.23
3. Upgrade of the railway passenger rolling stock on the national and TEN-T railway networks Upgrade the railway passenger rolling stock with up to date train units	115.00 (ERDF)	115.00	230.00
4. Sustainable development of the transport sector 4.1. Promote inter-modal transport 4.2. Improve traffic safety across transport modes 4.3. Minimize adverse effects of transport on the environment	215.55 (ERDF)	105.45	321.00
5.Technical Assistance Support for programme management, implementation, monitoring and control Support for information and publicity	45.28 (ERDF)	15.09	60.37
Total	4,010	995.48	5,005.48

Source: 2007-2013 Sectoral Operational Programme – Transport (SOPT)
http://www.mt.ro/engleza/index_eng.html

OPERATIONAL PROGRAMME 'ENVIRONMENT'

Priority Axis/Key intervention area	EU Contribution (EUR)	National Public Contribution (EUR)	Total Public Contribution (EUR)
Extension and modernization of water and wastewater systems Extension/modernisation of water and wastewater systems	3 776 532 160 (CF)	489 976 263	3 266 508 423
Development of integrated waste management systems and rehabilitation of historically contaminated sites Development of integrated waste management systems and extension of waste management infrastructure Rehabilitation of old ecological burdens	934 223 079 (ERDF)	233 555 770	1 167 778 849
Reduction of pollution and mitigation of climate change by restructuring and renovating urban heating systems towards energy efficiency targets in the identified local environmental hotspots	229 268 644 (CF)	229 268 644	458 537 288
Implementation of adequate management systems for nature protection Strengthen the management capacity of the nature and landscape protection bodies Develop and implement management plans for protected areas	171 988 693 (ERDF)	42 997 174	214 985 867

Implementation of adequate infrastructure of natural risk prevention in most vulnerable areas Protection against floods Reduction of coastal erosion	270 017 139 (CF)	59 128 815	329 145 954
Technical Assistance Support for OP management and evaluation Support for information and publicity	130 440 423 (ERDF)	43 480 141	173 920 564
Total	4 512 470 138	1 098 406 807	4 610 876 945

Source: 2007-2013 Sectoral Operational Programme Environment
http://www.mmediu.ro/programe_finantare/pos/00_Pos_Mediu/POS_Mediu_EN.pdf

OPERATIONAL PROGRAMME 'REGIONAL DEVELOPMENT' (ALL FUNDED BY ERDF)

Priority Axis/ Key intervention area	EU Contribution (EUR)	National Public Contribution (EUR)	Total Public Contribution (EUR)
Support to sustainable development of urban growth poles 1.1 Integrated urban development plans	1 117 806 529	273 365 256	391 171 785
Improvement of regional/local transport infrastructure Rehabilitation and modernization of the county roads and urban streets network, including construction/rehabilitation of ring roads	758 355 021	118 355 985	1 006
3.Improvement of social infrastructure 3.1. Rehabilitation, modernisation and equipping of the health services' infrastructure; Rehabilitation, modernization, development and equipping of social services infrastructure; Improving the equipment of operational units for public safety emergency interventions; Rehabilitation, modernization, development and equipping of pre–university, university education and continuous vocational training infrastructure.	558 903 260	98 629 992	657 533 252
Strengthening regional and local business environment Development of sustainable business support structures of regional and local importance to attract enterprises, mainly SMEs; Rehabilitation of unused polluted industrial sites and preparation for new activities; Support the development of micro-enterprises (procurement of equipment and modern production technologies, services, constructions; procurement of IT systems (software and equipment); use of new technologies; relocation of micro-enterprises in business structures; rehabilitation);	633 423 700	76 471 117	709 894 817
Sustainable development and promotion of tourism Restoration and sustainable valorisation of cultural heritage and setting up/ modernization of related infrastructure; Creation, development, modernization of tourism infrastructure for sustainable valorisation of natural resources and increasing the quality of tourism services;	558 903 264	57 862 924	6 188

Promoting the tourism potential and setting-up the necessary infrastructure to increase Romania's attractivity as tourism destination			
6.Technical Assistance	98 629 988	32 876 662	131 506 650
Total	3 726 021 762	657 561 936	4 383 583 698

Source: 2007-2013 Sectoral Operational Programme Regional Development
http://www.mdrl.ro/_documente/POR/POR_august_07.pdf

OPERATIONAL PROGRAMME 'HUMAN RESOURCES' (FUNDED BY ESF)

Priority Axis/Key intervention area	EU Contribution (EUR)	National Public Contribution (EUR)	Total Public Contribution (EUR)
1. Education and training in support for growth and development of a knowledge-based society 1.1 Access to quality education and initial TVET for growth and employment 1.2. University education for the knowledge society 1.3 Competitive human resources for education and professional training 1.4. Quality in Continuous Vocational Training 1.5. Doctoral and post-doctoral research programmes	797,803,989	193,984,825	991,788,814
2. Linking lifelong learning and labour market 2.1 Transition from school to active life; 2.2 Preventing and reducing early school drop-out; 2.3. Access to and participation in Continuous Vocational Training	911,775,778	79,621,406	991,397,184
3. Increasing adaptability of workers and enterprises 3.1 Promoting an entrepreneurial culture; 3.2 Training and support for enterprises and employees for promoting adaptability; 3.3 Developing partnerships and encouraging the initiatives of social partners and civil society;	450,189,271	69,467,140	519,656,411
4. Modernizing the public employment service 4.1 Strengthening the public employment services; 4.2 Training of public employment services personnel;	176,656,289	58,885,430	235,541,719
5.Promoting active employment measures 5.1. Development and implementation of active employment measures; 5.2 Promoting long-term sustainability of rural areas in terms of human resources and employment	476,402,823	66,953,221	543,356,044
Promoting social inclusion 6.1 Developing the social economy; 6.2 improving access to and participation of vulnerable groups in the labour market; 6.3 Promoting equal opportunities on the labour market; 6.4 trans-national initiatives on the labour market;	540,608,927	103,399,059	644,007,986
7. Technical Assistance 7.1. Support for the implementation, management and	122,707,919	40,902,637	163,610,556

evaluation of the OP 7.2. Support for promotion and communication			
Total	3,476,144,996	613,213,718	4,089,358,714

Source: 2007-2013 Sectoral Operational Programme Human Resources Development

http://www.fseromania.ro/images/downdocs/axe_posdru.pdf

OPERATIONAL PROGRAMME 'INCREASING ECONOMIC COMPETITIVENESS' (FUNDED BY ERDF)

Priority Axis/Key intervention area	EU Contribution (EUR)	National Public Contribution (EUR)	Total Public Contribution (EUR)	%
An innovative and eco-efficient productive system Productive investment and preparation for market competition of enterprises, especially SMEs; SMEs' access to funding; Development of sustainable entrepreneurship	928 651 290	151 175 785	1 079 827 075	35.87
Research, Technological Development and Innovation for competitiveness R&D partnerships between universities, R&D institutes and enterprises, for producing results transferrable to the economy 2.2 Investment for RDI infrastructure; 2.3 Enterprises' access to RDI activities, especially SMEs.	536 395 116	109 864 060	646 259 176	21.45
ICT for private and public sectors Sustaining the use of ICT; Developing effective public e-services; Developing the e-economy.	383 170 104	86 265 570	469 435 674	15.62
Increasing energy efficiency and security of supply, in the context of climate change Efficient and sustainable energy; Valorisation of renewable energy; resources for green energy production; Diversifying network interconnectivity to increase the security of energy supply.	638 475 370	87 064 824	725 540 194	24.08

Technical Assistance 5.1 Support for the programme management implementation monitoring and control; 5.2 Support for ICT communication, evaluation and IT/equipment acquisition	67 530 229	22 510 078	90 040 307	2.98
Total	2 554 222 109	456 880 317	3 011 102 426	100

OPERATIONAL PROGRAMME 'ADMINISTRATIVE CAPACITY' (FUNDED BY ESF)

Priority Axis	EU Contribution	National Public Contribution	Total Public Contribution
Structural and process improvements of the public policy management cycle	116,481,469	20,555,553	137,037,022
Improved quality and efficiency of the delivery of public services on a decentralised basis	83,201,049	14,682,538	97,883,587
Technical Assistance	8,320,104	2,773,368	11,093,472
Total	208,002,622	38,011,459	246,014,081

OPERATIONAL PROGRAMME 'TECHNICAL ASSISTANCE' (FUNDED BY ERDF)

Priority Axis	EU Contribution	National Public Contribution	Total Public Contribution
Support to the implementation of Structural Instruments and coordination of programmes	82 792 695	20 698 174	103 490 869
Further development and support for the functioning of the Single Management Information System	53 390 279	13 347 570	66 737 849
Dissemination of information and promotion of Structural Instruments	34 054 816	8 513 704	42 568 520
Total	170 237 790	42 559 448	7 238

b. OPERATIONAL PROGRAMMES UNDER THE TERRITORIAL CO-OPERATION OBJECTIVE

OPERATIONAL PROGRAMME 'ROMANIA-BULGARIA'

Priority Axis	EU Contribution	National Public Contribution	Total Public Contribution
Accessibility	80 594 790	14 832 151	26 941
Environment	76 238 315	13 646 018	84 333
Economic and Social Development	47 921 227	8 577 497	56 498 724
Technical Assistance	13 069 425	7 124 118	20 193 543
Total	217 823 757	44 179 784	262 003 541

OPERATIONAL PROGRAMME 'HUNGARY – ROMANIA'

Priority Axis	EU Contribution	National Public Contribution	Total Public Contribution
Improvement of key conditions for joint sustainable development in the co-operation area	114 482 217	20 202 744	134 684 961
Strengthening social and economic cohesion in the border area	96 524 222	17 033 686	113 557 908
Technical Assistance	13 468 496	13 468 496	26 936 992
Total	224 474 935	50 704 926	275 179 861

OPERATIONAL PROGRAMME 'SOUTH EAST EUROPE (SEE)'

Priority Axis	EU Contribution	National Public Contribution	Total Public Contribution
Innovation	44 051 157	7 773 734	51 824 891
Environment	53 739 828	9 483 499	63 223 327
Accessibility	55 160 834	9 734 265	64 895 099
Sustainable growth areas	41 338 329	7 294 999	48 633 328
Technical Assistance	12 401 497	4 133 832	16 535 329
Total	206 691 645	38 420 329	245 111 974

ANNEX F – OVERVIEW OF REGIONAL INNOVATION STRATEGIES

A brief overview of Regional Innovation Strategies (RIS) in Romania's regions is presented below in this order:

1. West Region;
2. South Muntenia Region;
3. Northwest Region;
4. Southeast Region;
5. Northeast Region;
6. Bucharest Ilfov Region.

West Region

West Region is the first region in Romania which elaborated a RIS for the period 2005-2008, as part of the FP5 Measure "Regional Innovation Strategies in the Associated Countries". The RIS aimed to speed up the economic development of the region by integrating innovation and knowledge into public policies and enterprise activities, in order to increase the competitiveness

of innovative products and services on the global market. The RIS provided the basis for regional innovation policy and the policy framework for participation in the European regional support actions. The Strategy was implemented since October 2005 with EU assistance[26]. So far, this strategic initiative led to the creation of **pilot projects**, such as:

- ***Tehimpuls*** – ***Regional Center for Innovation and Technology Transfer*** – created in 2006 by the West RDA, together with four universities and other local RDI institutions. The Centre aims to stimulate the regional economy and increase the competitiveness of local enterprises by structuring a local market for R&D and innovation through brokerage services. The centre provides assistance for developing innovative services and commercialising the results, and for encouraging collaboration between enterprises and R&D institutes, increasing awareness on innovation and technological transfer in the region. The target group of the Centre includes SMEs, large enterprises, universities, R&D and innovation units and foreign investors.
- ***AutomotiVest*** – ***Regional Cluster Initiative in Automotive Sector*** – this initiative brought together in June 2007 the region's main technical universities, three local automotive SMEs, the cities of Arad and Timisoara, two regional Chambers of Commerce and the West RDA in the non-governmental AutomotiVest Association aimed to promote a business model for the sector based on better collaboration between research and industry, increased cooperation and pooling of resources among companies. This was the first formal attempt to provide a framework for the automotive cluster development, by forging a network of cluster partners, establishing a regional supplier platform, providing assistance with technology collaboration and contacts with foreign companies, and developing a competence centre. AutomotiVest has joined several professional networks (BeLCAR, Co-Makers Romania) and together they participate in the FP7-funded project *"We Steer" – Support Actions for the Emergence of a Research-Driven Automotive Cluster in West Romania (2008-2010)*, which is expected to contribute to a more systematic and integrated approach to the formation of an automotive cluster (see further details at: http://www.iecsme.eu/uploads/descargas/177_PPT_West%20RDA_CLUSTERS%20INITIATIVES.pdf

- **Infrastructure projects and services for regional RDI.**

An updated **Regional Innovation Strategy 2009-2013** was produced by the West Region and was built around **3 strategic axes** (see further details at www.regiuneavest.ro):

1. Supporting the innovation infrastructure that generates added value in terms of RDI products/solutions/technologies;

[26] The EU assistance was provided through two consortia: Innovation Coach (Meta Group, TTI and EURADA) and IMIS (LOGOTECH SA, Greece; ADVANSIS Oy, Finland; i.con. innovation GmbH, Germany; CICOM, France), which provided consulting schemes for the development, design, and implementation of specific innovation measures resulting from the RIS Action Plan.

2. Supporting innovation in enterprises with the help of their internationalization;
3. Promoting the innovation culture at regional level.

South Muntenia Region

The RIS project of this region, called **InnSoM – 'Innovating South Muntenia'**, was conducted during 2005-2008, with two partners from EU regions[27] and 17 Romanian regional partners (representatives of SMEs sectors, local authorities, decentralised authorities, NGOs, education, research, etc.). The strategic objective of RIS InnSoM was to enhance competitiveness by maximising regional experiences and resources based on good practice from the EU and local, regional and international partnerships. The specific objectives are to build consensus around InnSoM goals and to ensure links with other regional plans and programmes (National Development Plan, Regional Operational Plan) addressing innovation (see more details at: http://www.innsom.ro/pagini/strategia_de_inovare_regionala.html). The new 2008-2013 RIS specifies the following priorities:

1. Increasing regional attractiveness;
2. Supporting the competitiveness of the regional economy;
3. Promoting and developing local entrepreneurship.

The Northwest Region

The RIS project of this region, called **REGIS-NW** was launched in May 2006 with the aim to analyse the regional innovation potential, stimulate technological transfer between research and business communities and elaborate a regional innovation strategy and a future action plan. The project involves relevant actors of the North-West region: county councils, town halls, universities, research centres, business environment representatives (see further details on specific objectives and estimated results at: http://www.nord-vest.ro/GenPage.aspx?pc=(RIS)despreProiect.aspx). REGIS-NW provides the framework for several **pilot projects**:

- The first **Regional Institute for Education, Research and Technology Transfer (IRECTT)** was launched in May 2007, by the Northwest RDA together with 14 public authorities and universities of the region. Created on the model of the European Institute of Technology, IRECTT was established as a joint-stock company, having as shareholders the local and county administrative agencies, state universities and an association of companies. The institute aims to develop competences in the education-R&D-innovation triangle and to bridge public authorities, academia and business. The Regional Institute aims to operate on three main platforms, in the areas of education, research and technological transfer.

[27] META Group s.r.l from Umbria Region, Italy, and the North-West England Development Agency, UK.

- **A Regional Network of Technological Transfer and Development** (a network of offices that ensure contact with the industry, establish, maintain and extend the relations between the suppliers of R&D results and the business community).
- **The RIERTT Project Factory** – an investment division within IRECTT that will generate investment project proposals, focusing on urban regeneration, business infrastructure/ research and tourism, and will strategic partner to bring the experience of EU markets.
- The **Competitiveness Pole "The Fortress of Science" in the Northern Transylvanian Region** (Cluj) – envisaged as a large partnership of local public authorities, research suppliers (universities, R&D institutions, NGOs with R&D profile), RDI facilitators (training centres, technological transfer units) and an international strategic partner, a research beneficiary (enterprises or associated companies) with a strong technical competence. The activity of the pole will concentrate on one of the following priority areas: health, agriculture, food safety and security, energy, environment or innovative materials, products or processes;
- **BISNet Transilvania** – a strategic project between the Central and North-West Regions, which aims to create the Support Network for Business and Innovation for SMEs in Transylvania. It will be linked to the European Enterprise Network and similar European networks. The BISNet partners are RDAs, universities, a research centre, a business incubator and a bank. The network comes to support SMEs, especially through consultancy services, technology offers, information on business opportunities, conducting needs analyses and market research, technological audit, training, facilitating participation to fairs and exhibitions, counselling on development project proposals and access to finance;
- **Development of regional clusters** through several projects, implemented in partnership with EU organizations within the territorial cooperation programmes of the European Union (e.g. **Mass Customization Project**, **Cluster Network);**
- Innovative Technologies for a Better Society and Romanian-Norwegian cooperation project for education and development in Northern Transylvania, having as a partner SINTEF Norway, the biggest private research institute in Scandinavia. The collaboration aims to transfer the Norwegian model of cooperation to the North-West Region and on that basis, develop a new, local model through adapting it to local needs;
- The **AsviLoc project,** which aims to create a network of the Regional Development Agencies of South-Eastern Europe in order to build a transnational innovation system. The project aims to improve the relationship between innovation stakeholders, on the basis of a new approach where innovation is no longer a linear process but the result of complex interactions between innovation actors and socio-economic actors.

(Source: selected from http://www.nord-vest.ro/GenPage.aspx?pc=SPI-Prezentare)

The Southeast Region

The RIS project of this region, called **ARISE** was conducted during 2005-2008 in partnership between the Southeast RDA, Tuscany Regional Government and Etruria Innovazione. ARISE aimed to enhance the cooperation between public authorities, research and business communities, and was structured along the following priorities:

a) Fostering an innovative culture as a major strategic benefit for regional economy;

b) Strengthening the R&D potential as a pre-requisite for innovation;

c) Public administration and services as strategic promoters of innovation;

d) ICT infrastructure as innovation pillar

e) Alternative energy sources in the South East Region.

f) (Source: selected from http://www.adrse.ro/proiect_ARISE.aspx).

Northeast Region

The RIS project for this region, called 'Development of an Innovative Strategy Continuously Oriented to Valorisation of the Economic Resources in Northeast Romania (DISCOVER NE ROMANIA) was conducted during 2005-2008, in partnership between Northeast RDA and three EU partners[28]. It aimed to develop a regional innovation support system and a competitive economic environment by establishing innovative companies, developing modern technologies in RDI institutes and stimulating partnerships between universities, research institutes and companies (see specific objectives and priorities of the RIS at http://www.adrnordest.ro/index.php?page=INNOVATION_PUBLICATIONS).

Bucharest-Ilfov region

The RIS project for this region was conducted during 2005-2008 by the Bucharest-Ilfov RDA in collaboration with CRIMM Foundation (Centre for SMEs), the Innovation Relay Centre Romania, METRON S.R.L. from the Abruzzo Region in Italy, Consorzio Progetto Lazio 1992 from the Lazio Region in Italy, the Campania Region in Italy, and West Macedonia University in Greece. It aimed to achieve a regional innovation strategy for the benefit of SMEs. The specific objectives of the RIS include identifying innovative projects of firms, developing promotion and extension of technology audits for SMEs, and training in innovative management (further details at http://www.adrbi.ro/dezvoltare-regionala/proiecte/proiecte-implementate/ris-regional-innovation-strategy-bucuresti-ilfov/prezentarea-ris-bucuresti-ilfov/

[28] METRON SRL from the Abruzzo Region in Italy and FUNDECYT from the Estramadura Region in Spain, with technical assistance by INFYDE, Spain.

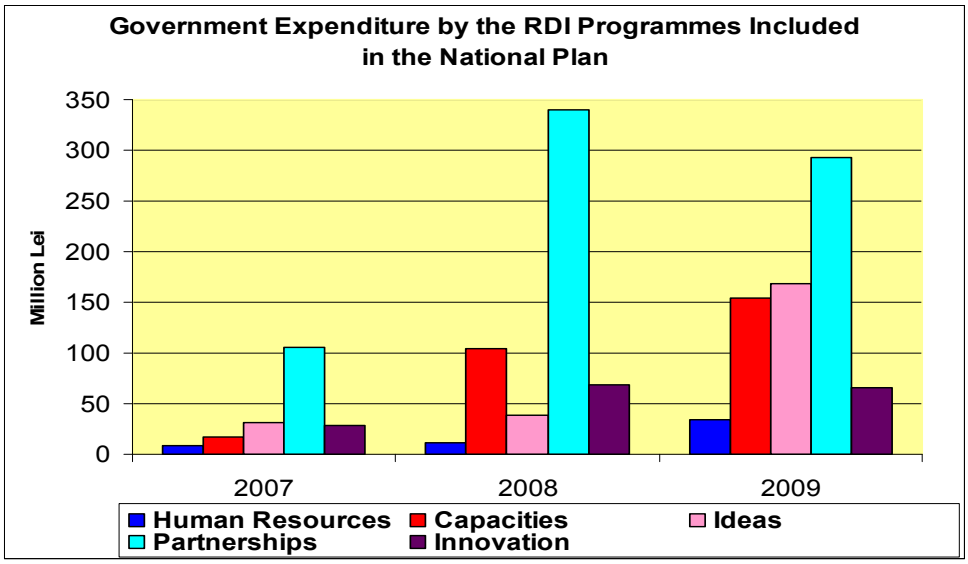
ANNEX G – OTHER RELEVANT INFORMATION ON PROGRAMMES, R&D EXPENDITURE ETC.

Table 1 – Main Programmes Coordinated by NASR

Programme	Brief description
2007-2013 National Plan for R&D and Innovation	Launched in May 2007, is the most important funding instrument of NASR, both policy- and budget-wise, and has the largest budget of all current programmes. It is organised in six programmes, similarly to the EU FP7 (Human Resources Ideas, Capacities, Partnerships, Innovation and Sustaining institutional performance). Participation in the programme is competition-based and the funding is allocated on an investment mode, with the highest share devoted to the Partnerships programme (see Figure 1 below for the 2007-2009 distribution of National RDI Plan funding by programme).
Core Programmes	Launched in 2003 as complementary measures to the 1999-2006 National RDI Plan. They are developed primarily by the national R&D institutes in view of realising long-term strategic objectives and are defined annually or multi-annually. They operate in an institutional regime, providing up to 60% of the institution's R&D expenditure in the previous year. After development by the national R&D institutes, the Core programmes are validated by the coordinating ministries of the respective sectors, and approved and funded by NASR. In 2009 NASR provided funding for 46 Core programmes.
Sectoral R&D plans	Introduced in 2002 also as complements to the 1999-2006 National RDI Plan to support sectoral technological development. The following ministries coordinate Sectoral R&D plans: Ministry of Education, Research, Innovation and Sports (NASR); Ministry of Economy, Trade and Business Environment; Ministry of Agriculture and Rural Development; Ministry of National Defence, Ministry of Administration and Home Affairs, Ministry of Communications and Information Society, Ministry of Transports and Infrastructure. The Sectoral R&D plans are competition-based and aim to transfer research results to industry and society, by supplying scientific expertise for policy-making in the ministries coordinating the respective sectors.
Sectoral Operational Programme for Increasing the Economic Competitiveness (SOP IEC)	Aims to increase the productivity of Romanian firms and reduce the productivity gaps to the EU. The most relevant component of the SOP-IEC for RDI is **Priority axis 2- Increasing the Economic Competitiveness through Research and Innovation,** which has the following objectives: o Develop research infrastructures, attract young people and highly qualified specialists for universities, R&D institutes and firms; o Strengthen knowledge supply from universities and R&D institutes; o Stimulate technology transfer and university-industry cooperation; o Stimulate innovation demand from enterprises; o Promote high technology firms; o Stimulate the development of excellence poles.
National R&D programme IMPACT	Launched in 2006 to run until 2010, it was aimed to increase the capacity to absorb Structural Funds for RDI through Priority Axis 2 of SOP IEC. It prepared a portfolio of projects improving firm competitiveness through the development of R&D activities and infrastructures, especially at regional level. Approx. 1,000 feasibility studies, business plans and other types of economic analyses were financed during 2006-2008 (NASR 2008, pp. 10-11), but in 2009 the

	programme was suspended due to lack of funding.

Figure 1 – Government Expenditure by Programme in the 2007-2013 National RDI Plan



Source: NASR (2010), p. 8