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**Monitoring and analysis of policies  
and public financing instruments  
conducive to higher levels of R&D investments  
The “POLICY MIX” Project**

**Country Review Romania**

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# Introduction and Policy mix concept

## **The policy mix project**

This report is one of the 31 country reviews produced as internal working papers for the research project “Monitoring and analysis of policies and public financing instruments conducive to higher levels of R&D investments” (Contract DG-RTD-2005-M-01-02, signed on 23 December 2005). This project is a research project conducted for DG Research, to serve as support for policy developments in Europe, notably in the framework of CREST activities. It does not form part of the ERAWATCH project, but the working documents are made available on ERAWATCH webpages for the purpose of steering a debate on the policy mix concept.

The “Policy Mix” project is run by a consortium of 7 partners:

- UNU-MERIT (The Netherlands), consortium leader
- Technopolis (The Netherlands)
- PREST – University of Manchester (United Kingdom)
- ZEW (Germany)
- Joanneum Research (Austria)
- Wiseguys Ltd. (United Kingdom)
- INTRASOFT International (Luxembourg).

Each country review is produced by an individual author, and provides expert’s view on the policy mix in the country. This report is not approved by the Commission or national authorities, and is produced under the responsibility of its author.

The role of country reviews is to provide an exploratory analysis of the current policy mixes in place in all countries and detect the most important areas of interactions between instruments as well as new modes of policy governance that are particularly adapted (or detrimental) for the building of policy mixes. They provide analytical material for the analysis of the policy mix concept and its implementation in Europe. This material will be used as background for further reports of the project and for the construction of a tool for policy-makers (to be made available in late 2007 and 2008).

## **The policy mix concept**

The country reviews are based on the methodological framework produced by the consortium to frame the “policy mix” concept. They have been implemented on the basis of expert assessments derived from the analysis of National Innovation Systems characteristics and policy mix settings, using key information sources such as Trendchart and ERAWATCH reports, OECD reviews, and national sources, among which the National Reform Programmes.

In this work, the “policy mix for R&D” is defined by the consortium as: **“the combination of policy instruments, which interact to influence the quantity and quality of R&D investments in public and private sectors.”**

In this definition, policy instruments are: “all programmes, organisations, rules and regulations with an active involvement of the public sector, which intentionally or unintentionally affect R&D investments”. This usually involves some public funding, but not always, as e.g. regulatory changes affect R&D investments without the intervention of public funds.

Interactions refer to: “the fact that the influence of one policy instrument is modified by the co-existence of other policy instruments in the policy mix”.

Influences on R&D investments are: “influences on R&D investments are either direct (in this case we consider instruments from the field of R&D policy) or indirect (in that case we consider all policy instruments from any policy field which indirectly impact on R&D investments)”.

## **Structure of the report**

The report is structured along the following questions.

First, in section 1, and in order to place the policy mix in context, the general challenges faced by the National Innovation System (NIS) are analysed by the expert. The view is here not restricted to the challenges with regard to raising R&D investments, but rather encompasses all the conditions that directly or indirectly affect the functioning of the NIS and R&D expenditures. These context conditions are very important for the discussion of the relevance of the policy mix later on.

Second, the stated main objectives and priorities of R&D policy in the country are spelled out in section 2, as well as their evolution over the last ca. five years. This discussion is based on White Papers and official documents, i.e. on published policy statements. The reality of these objectives compared to actual working of policy instruments will appear in section 5.

The third section provides an expert assessment and critical analysis of a possible gap or convergence between the NIS challenges and the main policy objectives and priorities stated before.

Section 4 presents the policy mix in place, following the above definition, i.e. policy instruments affecting R&D activities in the private and in the public sector, either directly for instruments from the R&D policy domain, but also indirectly for instruments outside the R&D domain which are of particular relevance to R&D activities. A typology of instruments is used, to categorise the R&D-specific and non-R&D specific instruments. A short description of each instrument is provided: aim, nature, target group, budget.

Then, section 5 discusses whether there is a gap between the main policy objectives and priorities stated in section 2, and the instruments in place. This is done by

comparing the set of objectives with the set of instruments at work. When individual evaluations of programmes or policy instruments are available, their results are used if they shed light on contribution of these instruments towards the policy objectives.

Section 6 discusses the orientation of the policy mix, indicating priorities amongst various possible routes to increase R&D investments. Policy instruments are categorised under 6 different routes according to their relevance, and this categorisation is followed by a discussion on the range of instruments affecting each route, missing instruments, routes that are not addressed by instruments, possible redundancies or overlaps, etc.

Section 7 provides another view on the policy mix, focusing on the relative importance of each types of instruments. The aim is to get a picture of the policy mix, the balance between (sets of) instruments, and the relative weight between them.

From section 8 onwards, the review turns to the crucial question of policy governance. That section discusses the emergence of the policy mix through examination of the following question: how did the set of R&D policy instruments arrive? What is the rationale behind them, what were the driving forces behind their establishment, and how is this evolving recently. A crucial question relates to the existence of some consideration of possible interactions when establishing new or suppressing existing instruments. The section tries to establish whether the policy design process is incremental or radical, analytical or non-analytical. From this, that section discusses if the policy mix is a “construct” or an “ex post” reality.

The next section, section 9, focuses on the governance of the system of R&D policy instruments take place. It examines the key question of interactions, i.e. whether there is a form of co-ordination between R&D policy and policy instruments from outside the R&D domain, and the existing mechanisms that favour or hinder such interactions.

The final section, section 10, deals with the core question of the policy mix concept: it endeavours to discuss interactions between policy instruments to affect R&D expenditure. The section discusses possible positive, neutral and negative effects of R&D policy instruments; both within the R&D policy domain, but also with instruments from other policy domains. In most cases, this takes the form of hypotheses rather than hard evidence.

### **Feedback welcome**

Feedback on this report is gladly received. Individual country reports will not be updated but discussion on policy mixes is welcome during the timeframe of the study (2006-2008). Please send your comments to:

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# 1. National Innovation System Challenges

The evolution of the Romanian Research and Innovation system has undergone important positive changes during the last five years, mainly due to the efforts for complying with the 2007 EU accession requirements and for ensuring the necessary conditions to achieve the overall Lisbon tasks.

The need for Romania to converge towards EU norms and practices has had a strong influence on shaping the policy mix and on the process of adopting particular policy instruments. The decentralization of the decision-making system, the externalization of the RDI management, the gradual increase of competition-based funding of R&D at national level, the diversity and flexibility of institutional funding systems and more recently, beginning with 2005, the promotion of excellent R&D performers through a special national R&D program are the main positive trends of the Romanian innovation system transformations.

The basic legislation exists and there is a harmonization between the national legislation and the European one. It allows access of all R&D system actors to public funds; it promotes multi-annual funding and stimulates collaborative and multidisciplinary research and also co-funding from a variety of funding sources.

## SWOT of Romanian NIS

Strengths	Weaknesses
<p>Decentralization of the decision-making system and externalization of the research program management system</p> <p>Capitalization on the experience acquired through the National RDI Plan for participation in FP6 and FP7</p> <p>Competition-based funding of RDI at national level</p> <p>Harmonization between basic national legislation and the legislation and the European one; it allows the access of all R&amp;D system actors to the public funds; promotes multi-annual funding it stimulates the collaborative and multidisciplinary research and also the co-funding from a variety of funding sources.</p> <p>The diversity and flexibility of the institutional models ;</p> <p>Promoting excellent R&amp;D performers (universities, research institutes, research teams) by a special R&amp;D national program (since 2005);</p>	<p>Incipient development stage of technology transfer and innovation infrastructure and diffusion mechanisms</p> <p>Need to align to EU quality and standardization criteria</p> <p>Low visibility of Romanian research</p> <p>Weak correlation between RDI and industrial policy</p> <p>Lack of a generalized system of policy evaluation;</p> <p>Lack of normative, stable and common framework for evaluation of programs (ex ante and ex post) according to efficiency of public spending ; Criteria for managerial performance are not mentioned in any law.</p> <p>The research 'career is not attractive for the young researchers and is not compatible with European Charta ;</p> <p>The joint venture capital and intellectual property rights are not encouraged;</p> <p>Absorptive capacity of knowledge and innovative procedures are not properly stimulated;</p> <p>Low transparency to the public eye;</p> <p>Mobility of researchers is nor sufficient stimulated;</p> <p>A normative and stable framework for research evaluation is not finished;</p> <p>There is no unitary evaluation criteria to all research</p>

Institutional framework for technology transfer by INFRATECH national program and national network of innovation and technology transfer ReNITT (since 2005) and by scientific, technological and industrial parks and technology platform	performers;
<b>Opportunities</b>	<b>Threats</b>
Progressive integration into the ERA Existence of national and regional RDI strategies and the European Integration strategy Existence of sectoral R&D networks Correlation of RDI strategies with Romania's 'roadmap' for EU integration New Sectoral Strategies (Export Strategy, Industrial Strategy, Rise of Competitiveness Strategy, National Development Plan) contain a chapter referring to R&D and innovation;	Low public funding of R&D vs. increasing costs of R&D equipment Drastic reduction of in-house business R&D Limited financial freedom in financial management of R&D programs Economic and organizational difficulty of main RDI actors

Source: Romania Trend Chart of Innovation (2005) and own evaluation

The NIS configuration in 2004-2005 reveals some challenges for Romanian policy makers: The number of R&D employees decreased from 5.71 in 1999 to 4.94 per thousand employees in 2004. Low salaries, inadequate research infrastructure for high performance, as well as the opportunities offered by research programs of other countries, led to a gradual increase in the average age of R&D personnel. Presently, researchers older than 50 years represent more than 33% of total researchers while the share of young researchers, under 30 years, is only of 13%.

There is not yet a balanced distribution of researchers among branches, research fields and regions. The regional distribution shows a major concentration of units (about 41%) and R&D personnel (about 50%) in Bucharest-Ilfov region. For the other regions, the weight of R&D personnel is between 4-5% (South-East, and South-West region) and 11% (South region).

Within the business sector the largest weight of researchers (FTE) was in the manufacturing industry (62%) in 2004. Almost 55% of researchers are within the technologic and engineering R&D fields in comparison with other research fields, such as natural sciences (15%), medical sciences (12,1%), social sciences (8,1%), agricultural sciences (6,6% )and humanist sciences (3,6%).

Networking activities (involving researchers from different R&D institutions and/or universities) take only place within the national research programmes. Yet, a good and encouraging example is the micro- and nano-technologies research network, which is permanently active and connected to other international networks as well.

The infrastructure does not tally with international competitive research requirements. Less than 40 % of R&D units have suitable equipment. Innovation expenditures are still very low, representing about 3% of the innovative enterprises' turnover in 2002, and 3.6% in 2004.

The structure of innovation expenditure shows that the highest weight is for equipment and software acquisition (53% in 2002, respectively 60% in 2004).

In house business R&D is weak and therefore lacks the affinity with research performed in R&D institutes and universities. According to the data of MER NASTI for 2005, enterprises, which perform R&D in house, represent almost 10% of total active enterprises, and their R&D personnel is 16% of the total. Innovation surveys on firms innovation indicate the companies' low concern for intellectual property rights protection by patenting.

**Conclusion: the first important challenge for Romania is represented by the improvement of the human resources capacities involved in science and innovation activities (considering both the number and the level of performance) and of their distribution by branches, fields of research and regions according to the economic and social needs.**

The Romanian R&D system is still fragmented as a heritage of the past. There are the research institutions of the Academies, former industry institutes - most of them have been recently privatized - , universities and few local private R&D bodies formed spontaneously with own resources. R&D is performed mainly in the Research Institute sector that consists of a large number of sector-based organizations performing applied R&D. Most of them have been negatively affected during the transition years by low state funding and limited demand for their services.

The critical problem for Romania is the weak, undefined network of relations between different type of research institutes and industry and consequently the low level of applicability of the research results into economy. At present, the main cooperation framework between research and the productive sector consists of the national RDI programs and direct orders (RDI procurement). The legal framework and the financial instruments to stimulate research activity and the application of research results in the economy (i.e. risk capital funds for high-tech start-ups, and spin-offs) are missing, as well as tax incentives to foster innovation activities in enterprises. Even if the co-financing is a criterion of application within the National R&D and Innovation Plan and its share represented more than 30% of the total budget of the NPRDI in 2005, it is not always correlated with the R&D demand in the business sector.

The technology-transfer and innovation (TTI) infrastructure, namely the organizations specialized in the dissemination, transfer and valorization of R&D results is still poorly developed. The future development and consolidation of TTI infrastructure via the INFRATECH program might ensure a favourable framework to strengthen the partnership between enterprises, universities and R&D institutions.

Yet, the public instruments are not sufficient in order to enhance the collaboration between the research sector and industry. There is a strong need for a friendly environment (legal, institutional) with respect to innovation in the private sector and for a coherent and attractive package of incentives for clustering and networking

**Conclusion: The second challenge is, on one hand, to strengthen the innovation and technology transfer mechanisms and infrastructures, and, on the other hand, to stimulate the absorption of R&D results and partnership between research institutes, higher-education institutions and industrial partners.**

The public financing system is gradually being transformed into a competitive system. After a long period of a declining R&D intensity (from 1% in 1990 to 0.39 % in 2004),

Romania has firmly engaged to increase the total expenditure for research, in order to catch up with the objectives established in the Lisbon Strategy. The Budget Law for 2006 no. 379/2005 stated that the public expenditure for R&D will reach, in 2006, 0.38% GDP – almost double the previous year level while the budget project for 2007 stipulates a percentage of 0.56% of GDP for R&D activities. However, as regards state aid the share of R&D aid is very low; it has never exceeded 0.5% of total aid. By comparison, some EU members registered up to a 20% share of R&D aid in the total state aid. At present state aid is focused on current objectives (mainly rescue and debt forgiveness) rather than on R&D and horizontal objectives. Consequently, state aid does not contribute sufficiently to the technological advance of Romanian companies. For the future, there is a considerable potential for increasing government spending for R&D; this potential derives from the need to change the destination of state aid in favour of R&D and other horizontal objectives.

The contribution of the business sector to R&D financing was 17% in 2004 and thus far from reaching two thirds of GERD in 2015. The dynamics of business R&D funding are not positive either. In addition, Romania has not benefited from a dynamic evolution of venture capital funds oriented towards R&D and innovative industries as compared with European trends. However, recent government strategies attempt to correct this situation; policies in R&D and innovation concentrate on measures that can stimulate the role of venture capital in the development of innovative industries.

**Conclusion: Accelerate pace of growing business sector contribution to the GERD, using direct and especially indirect specific incentives, in order to reach the level of private financing of 2% of GDP in 2015.**

**Therefore, the main challenges faced by the Romanian NIS are as following:**

1. Improving human resources capacities involved in science and innovation activities (considering both the number and the level of performance) and their distribution by branches, fields of research and regions according to the economic and social needs.
2. Strengthening the innovation and technology transfer mechanisms and infrastructures, as well as stimulating the absorption of R&D results and partnership between research institutes, high-education institutions and industrial partners.
3. Accelerate pace of growing business sector contribution to the GERD, using direct and especially indirect specific incentives, in order to reach the level of private financing of 2% of GDP in 2015.

## 2. Objectives and priorities of R&D policy

Since 1999 Romania carries out processes of priority setting. The National Priority Programs RELANSIN, CALIST, INFRAS and CORINT were launched within the Research-Development and Innovation National Plan aiming to couple the major priorities of economic and social development and those of R&D sector. The main objectives of the mentioned programs are: to increase the impact of the R&D on the economy and society in order to re-launch a sustainable development; the improvement of innovation in order to directly sustain the development of the quality and competitiveness of the Romanian products and services; the concentration of competencies and resources within the science and technology community in order to enlarge the national scientific, technological and innovation heritage; the harmonization with the European legal, institutional and procedural framework in order to be able to implement quickly and effectively the accession partnership.

The National R&D plan was updated first in 2001, covering the period until 2005. In September 2001 priority programs were launched in the following sectoral fields: agriculture and food industry (AGRAL), environment and energy (MENER), transports (ANTRANS), life and health (VIASAN), inventions (INVENT), information society (INFOSOC), biotechnology (BIOTECH), materials and nanotechnology (MATNANTEH), aerospace (AEROSPATIAL), economic and social (CERES). The new plan shifted the emphasis from supply-oriented actions to demand-oriented actions in order to satisfy better the economy and society's needs. Co-operation with the enterprises was consolidated. Furthermore, Romania intends to ensure a steady correlation of national R&D programs with European ones.

**For the period 2005-2008 the Romanian Government has focused, on the following strategic objectives:**

1. Increase the role of research in the development and transfer of advanced technologies in the economy, which secures the competitiveness of some sectors on international markets;
2. Closer correlation between the innovation and R&D activities and the Romanian industrial policy, as well as the long-term consolidation of the link between the R&D sector and economic environment, through: the development of technology transfer mechanisms and the stimulation of the private sector participation in R&D and innovation activities;
3. Increase of total expenditure on R&D sector up to 1% of GDP until 2007, and of the public expenditure up to 1% of GDP until 2010
4. Strengthening of R&D capabilities both in the field at the public authorities' level, as well as at the level of the personnel involved in R&D.

**The new National R&D Program, 2007-2013** (June 2006), which is the main instrument for the implementation of the National RDI Strategy 2007-2013, introduced the following objectives, which focused especially on NIS challenges:

1. Increasing the number of researchers and their professional performances. (“Human Resources” Program);
2. Developing the research capacities and opening the RDI system toward the international scientific and the national socio-economic environment. (“Capacities” program);
3. Achieving high scientific and technologic results, comparable to those obtained at the European level reflected in the increased visibility and international acknowledgment of the Romanian research. (“Ideas” program);
4. Improving the economic competitiveness and the social quality through stimulating the partnerships for knowledge development in primary RDI fields at the national level, materialized in innovative technologies, products and services. (“Competitiveness through partnership” program);
5. Growing the ability of innovation, technologic development and assimilation in production of the researching results with the goal of improving the national economy’s competitiveness and the quality of living. (“Innovation” program)
6. Supporting the institutional performance through ensuring the continuity and stability of the activities of the RDI entities addressing the implementation of own development strategies drawn up in accordance with the National RDI Strategy. (“Sustaining the institutional performance” program)

There are also some complementary policies that contain objectives related to the R&D field. **The National Export Strategy** mentioned the role of R&D in a section on “Bridging technology gaps”, which calls for a more rapid development of the advanced technologies. The section “Bridging the competitiveness gap” calls to increase the capacity of enterprises to cope with the pace of technological evolution and competition at European and international levels. It also refers to high value added exports and the need to develop R&D and innovation activities in enterprises, especially in high- tech domains.

**In the National Program of Reforms**, an important objective is to improve competitiveness and productivity by increasing knowledge and innovation.

**The Sectoral Operational Programme - Improvement of Economic Competitiveness** is the main instrument for achieving the first national thematic priority of NDP 2007 – 2013, i.e. Improvement of Economic Competitiveness and Development of Knowledge Based Economy. The general objective of SOP is to increase the Romanian companies’ productivity. Two of four specific objectives are related to R&D and innovation activities (increase of the R&D capacity and stimulation of the cooperation between RDI institutions and the productive sector). Among others they relate to funding of R&D projects that will generate results directly applicable in the economy, infrastructure, the stimulation of innovation demand and valorisation of the ICT potential and its application. Here, the target is to multiply the number of the Internet users (enterprises’ access to on-line services) from 52% in 2003 to 70% in 2015.

**The Action Plan for Romania’s Industrial Policy in 2005-2008** states that Research, Development and Innovation should become a determining factor for economic development and increased competitiveness in the industrial sector; It emphasises public-private partnerships, in order to create a framework for sustainable growth and fulfilling the objectives of the Lisbon

strategy and the support of the development of innovation networks and technological transfer mechanisms from the research sector to the economy.

Innovation, should have an important role within industry by developing sectoral programmes (in addition to the National R&D and Innovation Plan) oriented towards stimulating innovation as the „National Plan for Infrastructure Development, Innovation and Technological Transfer – INFRATECH”.

### 3. Coherence between NIS challenges and R&D objectives and priorities

Following the obligations in the science and research chapter of the accession treaty R&D and innovation are considered as top priorities in the economic and social development strategies at national, sectoral and regional levels. Consequently, policy should be marked by a coherence between general, strategic priorities and objectives and challenges. For example, the challenge regarding the development of the human R&I capacity is coherent with the new National Research, Development and Innovation Plan (2006), focusing on the main objective of the new NRDI plan. This objective is implemented by two programs - referring specifically to the human resources development and to the RDI infrastructure – named: *Human Resources and Capacities*.

The second challenge mentioned in chapter 1, strengthening the innovation and technology transfer mechanisms and infrastructures, is to be found in the second and fifth objective of the National R&D programme 2006-2013. Taking into consideration the importance of fundamental research for knowledge development, as well as the fact that it ensures a solid ground for applicative research and technologic development through generating ideas and through the capacity of providing the high-trained and qualified human resources required in performing these activities, the Plan contains a program specially designed for this kind of scientific research activity, named *Ideas*, which could also contribute to the strengthening of R&D knowledge base and to improving the knowledge transfer.

The third and the most complex program of the Plan, named *Competitiveness through partnership*, aims at creating the proper conditions for a better cooperation between the various RDI entities. This program comprises several sub-programs pursuing multiple research directions with bold inter-disciplinary character – which are the consequence of the extensive consultative action carried out within the foresight exercise that took place between September 2005 and May 2006. Holding in view the significance of completing the research through applied results (outcomes) related to the technical and technological developments, the Plan contains the *Innovation* program dedicated to the technologic development and innovation.

In general, the National RDI Plan's objectives are formally harmonized with the directions and objectives of the National Development Plan, other sectoral strategies designed at the national level, as well as with the European Union's scientific research streams. However, in policy formulation there is an obvious need to adopt holistic approaches and to formulate inclusive visions, based on SWOT analyses and periodic policy and instrument reviews; There is also a strong need to encourage use of strategic instruments, official statistics, and to pursue assessments and evaluations of policies (mixes).

Fewer approaches in policy objective formulation are addressed to the following issues: balance between the structure and roles of the universities and of the research institutes sector for improving innovation system performance and the needs of all R&D and innovation actors / areas of strategic importance; concentration of resources in particular areas and sectors deemed critical to future development; prioritization involving the concentration of resources on particular institutions, sectors or regions in order to establish critical masses; balances between

competitive and non-competitive R&D funding, and between national and regional innovation strategies.

Given that the RDI activities involve policy fields belonging to different ministries (Ministry of Education and Research, Ministry of Economy and Commerce), the cooperation and communication between these structures represent a precondition for a real coherence between challenges and objectives. As a co-ordination body for priority setting the Council of Science and Technology will be set up in 2007, according to the new R&D and Innovation Plan. 2007-2013.

Basically, allocations for research programs are based on indicators of strategic priority, in correlation with the programs' specific contribution toward the strategic objectives fulfilment. In practice, the implementation of these objectives has faced some legal, institutional or managerial obstacles. The evaluation of priority implementation and achievement of objectives is mainly carried out through annual reports. The evaluation is prevalingly ex post, and comprises no qualitative appreciation and impact studies. A comparative analysis of the research funds structure and of R&D outcomes shows that the "priorities" set in the distribution of funds, especially to the industrial RDI, had not a visible economic impact on performance of the industry. The research potential could contribute much more to economic growth if the environment is likely to encourage the development of the high performance R&D institutes or research teams.

At the micro level there are some impediments in attending the R&D objectives: unclear criteria and lack of transparency in programme funds allocation, weak programme monitoring and communication between programme managers, poor correlation between the offer of RDI projects and the needs of economic agents, leading to inefficient co-funding from economic agents and low applicability of results.

## 4. Composition of the policy Mix for R&D

In the following table we tried to identify all relevant instruments of Policy Mix for R&D, inside and outside of R&D field, having a direct or indirect impact on R&D intensity.

**Tabel nr. 1 Composition for Policy ix in Romania**

			Main policy instruments in place:
I. R&D SPECIFIC			
R&D Domain			
1.	R&D Policy		
	Generic	<p>2004 - 2006</p> <p>Ministry for Education and Research (MER)</p> <p>October 2006</p> <p>Ministry for Education and Research (MER) - National Agency for Science, Technology and Innovation (ANSTI)</p>	<p><b>NATIONAL PLAN FOR R&amp;D AND INNOVATION (NPRDI) 2004-2006.</b> The first version of this plan was introduced in <b>1999</b>, updated in <b>2001</b> to cover the period 2001-2004, and updated again in <b>2004</b> to cover the period up to 2006:</p> <p>It includes the 15 RDI programs distributed by S&amp;T fields, based on the major economic and social targets; 10 from the 15 RDI programs are focused on technological development in: agriculture, environment, health, energy, transportation, industry, quality, information technology, biotechnology, new materials and nano-technologies, aeronautics and space technologies.</p> <p>Management: National Agency for Science, Technology and Innovation;</p> <p>Allocation of funds on competitive base, co-financed is stimulated.</p> <p>Target groups : universities, public or private research institutes, big state-owned or private and SMEs, firms, researchers.</p> <p><b>NATIONAL PLAN FOR R&amp;D AND INNOVATION (NPRDI) 2007-2013</b> came out in October 2006.</p> <p>Estimated public budget (in accordance with the national fiscal medium-term strategy):</p> <ul style="list-style-type: none"> <li>• 2006 - 0,38% in GDP;</li> <li>• 2007 - 0,56% in GDP;</li> <li>• 2008 - 0,75% in GDP;</li> <li>• 2009 - 0,93% in GDP;</li> <li>• 2010 – 1% in GDP.</li> </ul> <p>Estimated private budget:</p> <ul style="list-style-type: none"> <li>• 2005 - 0,45% in GDP;</li> <li>• 2010 – 2% in GDP???</li> </ul> <p><b>NPRDI 2007 – 2013 main 3 objectives:</b> knowledge creation, economic competitiveness and social quality increase are correlated with the <b>6 programs:</b> human resources, capacities, ideas, competitiveness trough partnerships, innovation and institutional performance in order to reach the <b>strategic vision:</b> “<i>Romanian science progress promoted in accordance with the knowledge economy standards, in order to guarantee health, prosperity and well-being through inventions, learning and innovation</i>”.</p>

		2006 – 2010  MER - National Agency for Science, Technology and Innovation	<b>IMPACT PROGRAM</b> – aiming at stimulating the partnerships and development of RDI portfolio of Romanian projects able to absorb the structural funds during 2007 – 2013. First competition in October 2006; funds are allocated to the consortia consisting of universities, research institutes and industrial firms. Main projects financed are related to consultancy for elaborating the feasibility analysis, business plans, market research and impact studies.
		2005 – present  MER - National Agency for Science, Technology and Innovation	<b>“RESEARCH OF EXCELLENCE” PROGRAM:</b> - promotes the development of a high quality and competitive research potential, infrastructures and activities, in view of a better correlation with the priorities of the European Research Area, including those promoted by the future EU Framework Research Program for 2007-2013 (FP7); the program involves four measures supporting: <ul style="list-style-type: none"> <li>• Complex R&amp;D projects and integrated technological networks;</li> <li>• The career development of young researchers;</li> <li>• Efforts to improve the visibility of Romanian R&amp;D institutions and programs;</li> <li>• Improvements to the test and measurement infrastructure.</li> </ul> Target groups : universities, public or private research institutes, big state-owned or private and SMEs, firms, researchers.
		2005 – present  Ministry for Education and Research (MER)	<b>RESEARCH FOR SECURITY PROGRAM</b> – being correlated with the similar European research program etc.
		2004 – 2007  MER - National Agency for Science, Technology and Innovation	<b>INFRA TECH PROGRAM</b> - aimed at the development of specialised infrastructures for technology transfer and innovation and focuses on development at a regional level, including support for technical assistance and information centres, technology transfer centres, incubators and science and technology parks. Estimated budget: 100 million RON, out of which 20 million RON for 2006.
		2003 – 2008  MER - National Agency for Science, Technology and Innovation	<b>CORE/NUCLEUS NATIONAL RESEARCH PROGRAMS</b> – launched at the end of 2003 as program specific to National R&D Institutes and/or public research institutions, meant to support specific sectoral development objectives of the medium- and long-term RDI strategy of the respective institutions. These programs are complementary to the National RDI Plan. They are approved and funded by the Ministry of Education and Research with maximum 50% of the R&D income of the institution, realized in the year prior to the funding application.
		1996 – present	<b>THE GRANTS PROGRAMS FOR SCIENTIFIC RESEARCH</b> - supports the formation of scientific careers

		MER - National Agency for Science, Technology and Innovation	and the development of research teams around scientific personalities, especially within the universities.
		1996 – present Romanian Academy	<ul style="list-style-type: none"> <li>• NATIONAL PRIORITY PROJECTS - for high complexity scientific and cultural matters, with great impact at national level;</li> <li>• PROGRAM OF GRANTS FOR SCIENTIFIC RESEARCH - GAR – Romanian Academy Grants Program.</li> </ul>
	Sectoral	2006 – present Ministry of Economy and Trade	<p><b>SECTORAL PLAN FOR RDI IN INDUSTRY 2006 – 2008</b> – aiming at financing and supporting the efforts of manufacturing industry, environment and quality infrastructure sector, mineral resources and energy sector to perform RDI investments and to capitalize their result; the budget allocated:</p> <ul style="list-style-type: none"> <li>• 2006 - 1,031 RON</li> <li>• 2007 - 5,588,000 RON</li> <li>• 2008 - 615,000 RON</li> </ul>
		2001 – present Ministry for Education and Research (MER) - National Agency for Science, Technology and Innovation	<p>The sectoral instruments are:</p> <p><b>1. AGRAL – Program for Agriculture and Food (2001-2008)</b> - Aims to ground science and find solutions, methods, develop technologies and equipment for a sustainable development of agricultural and food products, for reaching food security, improve the quality of life and for a sustainable rural development in Romania. Target group: economic enterprises, Academy of Agriculture and Forestry Sciences, national institutes, non-governmental bodies, companies, universities, etc. Budget: 10.11% of the total amount of NPRD; Total value 2005: 26,206,741.10 RON; Co-finance: 25.1%</p> <p><b>2. CERES – Program for basic research of socio-economic and cultural interest (2001-2008)</b> - the Institute of Atomic Physics (IFA) of Bucharest manages The program. The purpose of the program is to: to expand knowledge capacity and to enhance the generation of new scientific and technological knowledge in leading domains of research; to ground and sustain policies and strategies for a sustainable development; to boost the capitalization of cultural patrimony. Beneficiaries: economic enterprises, national institutes, non-governmental bodies, companies, universities, etc Budget: 11.81% of the total NPRD; Total value: 23,650,805.66 RON in 2005; Co-finance: 37.9%</p> <p><b>3. MATNANTECH – Program for New Materials, micro- and nano-technologies (2001-2008)</b> - Aims to develop R&amp;D activities in science and engineering of new materials, micro- and nano-technologies for increasing the competitiveness of national production of new materials Beneficiaries: economic enterprises, national institutes, non-governmental bodies, companies, universities, etc.</p>

		<p>Budget: 7.54% of the NPRD funds in 2005, that is 19,858,206.32 RON; Co-financing: 25.4%</p> <p><b>4. AEROSPATIAL</b> (since 2001) – <b>Program for Technologies in Aeronautics and Space field</b>, managed by the Romanian Space Agency. The purpose of the program is to:</p> <ul style="list-style-type: none"> <li>• Develop basic and applied research in the aeronautics and space domain;</li> <li>• Promote the socio-economic implementation of research applications in telecommunications, medicine, agriculture and forestry, environment protection, geology, meteorology, etc.</li> </ul> <p>Beneficiaries: economic enterprises, national institutes, non-governmental bodies, companies, universities, etc.  Budget: 2006 - 6.43% of NPRD; Total amount RON: 16,417,501.40; Co-finance: 22.5%</p> <p><b>5. INFOSOC – Program for Information Society</b> (since 2001) - The program is managed by the National Institute of Informatics (ICI) of Bucharest. The purpose of the program is to stimulate the development of Information Society in Romania, in view of transition to the knowledge economy, in line with the Medium-term Development Strategy of Romania, the National IT Strategy and EU documents on 'e-Europe'. The general objectives of the program are:</p> <ol style="list-style-type: none"> <li>1. Create an adequate framework for the development of Information Society in Romania;</li> <li>2. Develop the S&amp;T support for Information Society structures and services;</li> <li>3. Increase the use and impact of Information Society structures and services on economy and society.</li> </ol> <p>Budget: 2005 - 7,758,655.0 RON, 3,38% of the total budget of the National RDI Plan, and was distributed to 4 sub-programs; Co-finance: 21.2%</p> <p><b>6. INFRAS – Program for Consolidation of Infrastructure of Standardization and Quality</b> (since 1999) - The program is managed by the Romanian Accreditation Association (RENAR), which is a member of the European Cooperation for Accreditation. The purpose of the program is to develop activities related to conformity assessment and standardization, in line with international principles and practices meant to remove trade barriers and to encourage international partnerships. To this end, INFRAS aims to create new bodies for quality infrastructures and consolidate the existing ones, making them compatible to the EU principles and practices in the area. The general objective of the program is to develop the national infrastructure for conformity assessment and standardization in accordance with EU legislation and practices, in view of signing the European Protocol on Conformity Assessment.  Budget: 2005 - 3,10% of the total budget of the National RDI Plan  Target group: economic enterprises, national institutes, non-governmental bodies, companies, universities, etc.</p> <p><b>7. CALIST – Program for Quality and Standardization</b></p>
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			<p>(since 1999) -The program is managed by the Academy of Economic Studies (ASE) of Bucharest and the General Association of Romanian Engineers (AGIR), The purpose of the program is to enhance the safety and the quality of Romanian products and to align them to international standards, especially to EU ones. Secondly, the program aims to monitor the correct implementation of EU requirements concerning the EU market, especially those regarding the free circulation of goods, products, services and people. Budget: 5.6% of NPRD; Co-finance: 29.1% Target group: economic enterprises, national institutes, non-governmental bodies, companies, universities, etc.</p> <p><b>8. RELANSIN – Program for Economic Revival through Research and Innovation</b> (since 1999) aims at supporting the economic relaunch and competitiveness of economic units, by implementing RDI projects that improve the performance and quality of products, technologies and services. The program is managed by the Management Agency for Scientific Research, Innovation and Technology Transfer (AMCSIT) Bucharest. The purpose of the program is to support the country's economic revival and industrial competitiveness by implementing integrated RDI projects that promote modernization and quality improvement of products, technologies and services. Budget: 13% of the total budget of the National RDI Plan in 2005 and is distributed to 18 sub-programs; Co-finance: 26.5% Target group: economic enterprises, Academy of Agriculture and Forestry Sciences, Academy of Medical Sciences, national institutes, non-governmental bodies, companies, universities, etc.</p> <p><b>9. INVENT – Program for Stimulating Invention Application</b> (since 2001) - The program is managed by the National R&amp;D Institute for Machines and Equipment for Agriculture and Food Industry (INMA) of Bucharest. The purpose of the program is to stimulate the economic application of inventions, especially in technologically advanced fields. Budget: 2005 - 3.96% of the total budget of the National RDI Plan, and was distributed to 3 sub-programs; Co-financing: 34.2% Target group: economic enterprises, national institutes, non-governmental bodies, companies, universities, etc.</p> <p><b>10. BIOTECH – Program for Biotechnologies</b> (since 2001) - It is devoted to stimulate innovation for the development of new technologies and bio-products ; a multi-sectoral program, performed by co-operation and by setting up and developing networks, research centers and services Budget: 2005 - 7.1% of NPRD funds; Co-finance: 18.32% Target group: economic enterprises, national institutes, non-governmental bodies, companies, universities, etc.</p> <p><b>11. MENER – Program for Environment, Energy and Resources</b> (since 200) program is managed by the Polytechnic University Bucharest - Faculty of Energy. The</p>
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			<p>purpose of the program is to promote competitiveness and sustainable economic development through:</p> <ul style="list-style-type: none"> <li>• Protection, valorization and rational exploitation of environment and natural resources of the country;</li> <li>• Improving environment quality in view of better life quality and sustainable socio-economic development;</li> <li>• Scientific and technological methods, technologies and equipment for forecasting, protection, intervention and reduction of natural risk;</li> <li>• Higher efficiency in the energy production-transport-exploitation chain and alignment of the energy sector to EU standards;</li> <li>• Protection of the geological environment and rational exploitation of mineral resources.</li> <li>• Provide the scientific and technological support needed for nuclear energy activities,</li> </ul> <p>Budget: 2005 - 6.45% of the amount funds of NPRD in 2005; Co-finance: 66.5%.</p> <p>Target group: national authorities in domain, economic enterprises, national institutes, non-governmental bodies, companies, universities, etc.</p> <p><b>12. AMTRANS – Program for Civil Planning and Transports.</b> The program is managed by a consortium made of IPA S.A. and SIAT S.A. The purpose of the program is to:</p> <ul style="list-style-type: none"> <li>• Provide a balanced management of the Romanian territory in terms of use of basic resources and quality in constructions, urbanism and civil planning;</li> <li>• Develop safe and non-polluting public and goods transportation, by ensuring: interoperability and interconnectivity of transport networks</li> </ul> <p>Budget: 2005 - 8.34% of the total budget of the National RDI Plan, distributed to 4 sub-programs; Co-finance: 37.6%</p> <p>Target group: economic enterprises, national institutes, non-governmental bodies, companies, universities, etc.</p> <p><b>13. VIASAN – Program for Life and Health</b> (since 2001) - Aims to promote and support basic-strategic-and applied medical research, with the view to understand mechanisms of man’s falling sick, in treatment of pathological illnesses with great impact upon population.</p> <p>Budget: 7.01% of the total budget of NPRD in 2005; Co-finance: 9.5%</p> <p>Target group: economic enterprises, Ministry of Health, national institutes, non-governmental bodies, companies, universities, etc.</p> <p><b>14. SECURITY - Research for Security Program (2005 – 2008) – Program for research, techniques and systems for security and defense</b> - It aims to support activities of research and development of new models, methods, systems, technologies and products with civil and military applications</p> <p>Budget 2005: 0.82% of NPRD</p> <p>Target groups : economic enterprises, national institutes, non-governmental bodies, companies, universities, etc.</p> <p><b>15. CORINT – Program for International Co-operation and International Partnership</b> (since 1999). The program is</p>
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			<p>managed by the Ministry of Education and Research. The purpose of the program is to support the integration of the Romanian S&amp;T community into the international community, by harmonizing national R&amp;D development policies with international ones and adopting modern management methods.</p> <p>Budget: 2005 - 4.78% of the total budget of the National RDI Plan and was distributed on 6 sub-programs.</p> <p>Target groups: economic enterprises, national institutes, non-governmental</p>
		<p>2003 – present</p> <p>Different ministries related to the sector</p>	<p><b>RESEARCH IN SPECIFIC SECTORS AND DEVELOPMENT PROGRAMS</b> - financed by the ministries, which coordinate the respective sectors. Their main aim is to cover the technological development gaps specific to each sector level.</p>
2.	R&D/Innovation Policy		
	Linkage Policy	<p>2005 - present</p> <p>Ministry for Education and Research (MER) - National Agency for Science, Technology and Innovation (ANSTI)</p>	<p><b>NPRD</b> (aprox.30% from the budget) and CEEEX programme – first module “<b>Complex R&amp;D projects</b>” by which are promoted long term <b>public-private partnership, and academy-industry relations</b>; the projects are performed by consortiums composed by research institutes, university research departments, industrial R&amp;D lab, belonging to private or public firms. Is aiming:</p> <ul style="list-style-type: none"> <li>- The increase of the collaborative projects and increasing of the contribution of private sector to R&amp;D financing.</li> <li>- The <b>diffusion of knowledge and technology transfer</b> by R&amp;D projects are stimulated also by CEEEX, PNCD (50 % of the projects) <b>and IMPACT</b> programme (the majority of the projects);</li> <li>- <b>R&amp;D clustering, especial in the high tech field</b> is another purpose of the mentioned programmes;</li> <li>- <b>INFRATECH programme</b> by which have been established 9 incubators, 10 technology transfer centres, 4 centres of technology information, 7 scientific and technological parks in different region: Arad, Craiova, Cluj Napoca,Deva, Iasi, Ramnicu Valcea, Timisoara, Tulcea.;</li> </ul>
		<p>2006 - present</p> <p>National Agency for Small and Medium Sized Enterprises</p>	<p><b>NATIONAL MULTI-ANNUAL PROGRAM FOR SETTING UP AND DEVELOPMENT OF TECHNOLOGICAL AND BUSINESS INCUBATORS 2006 – 2009</b> - in this regard it was endorsed the Agreement Memorandum between UNDP and NASMEC and was signed Co-financing Agreement of the National Multi-Annual Program for the Period 2002-2005 for Setting up and Development of Technological and Business Incubators for the budgetary year 2003. NASMEC and UNDP experts will establish locations of the incubators as a result of analysis made in territory.</p>
		<p>2006 - present</p> <p>Ministry of</p>	<p><b>“KNOWLEDGE-BASED ECONOMY” PROGRAM</b> - advanced e-business and e-government applications are developed through this program:</p> <ul style="list-style-type: none"> <li>• <b>Electronic system for on line registration of</b></li> </ul>

	Communications and Information Technology (MCIT)	<p><b>authorized individuals and family businesses</b></p> <ul style="list-style-type: none"> <li>• <b>Integrated system for issuance of civil status documents</b> – e.g. promotion of the electronic commerce and providing financial and technical assistance for implementing the innovating solutions for SME</li> <li>• <b>Designing the portal for promotion of the electronic commerce and the business networks (eStore)</b></li> </ul>
	<p>2004 – present</p> <p>Ministry for Education and Research (MER) - National Agency for Science, Technology and Innovation</p>	<p><b>INTERDISCIPLINARY PLATFORMS/LABS PROGRAM</b>- based on institutional funding. E.g.: In the continuous action of enhancing the visibility of the results of the national R&amp;D, MER has financed a <b>Portal for Technology Information</b> that will be a correct and updated information tool for the community of researchers and for the companies interested in the technological transfer of the results.</p> <p>Portal Functions:</p> <ul style="list-style-type: none"> <li>• the on-line information of all the actors implied in the R&amp;D and technology transfer process, about the results exploitation of the budget financed projects;</li> <li>• presentation of the technical-scientific features associate to the R&amp;D results;</li> <li>• expression of the problems (demands) to the companies level and the identification and solving of the research necessities;</li> <li>• a data base containing information about R&amp;D projects, results, and their users performance;</li> <li>• a virtual forum on the researchers and companies problems occurred from the exploitation of R&amp;D results;</li> <li>• a HELP and a FAQ component.</li> </ul> <p>Consortium: the Techno Info project has been developed in the <i>Sector Plan</i> of the Ministry of Education and Research, financing contract 1 / 2004, by the contribution of the following partners: - IPA S.A. Bucharest - Coordinator - SIAT S.A. Bucharest - AMCSIT-Polytechnic Bucharest</p>
	<p>2002 – 2005</p> <p>Ministry of Public Administration and Home Affairs</p>	<p><b>THE INDUSTRIAL AND SOFTWARE PARKS PROGRAM</b> was created in 2001 by the ' Ministry of Development and Prognosis' and was approved to run over the 2002-2005 period. The program was managed by the Ministry of Development and Prognosis until July 2003, when the ministry turned into the National Commission of Prognosis and the program management was attributed to the Ministry of Public Administration and Home Affairs. The Program aims at improving the regional infrastructure by encouraging economic diversification and private initiatives through industrial and software parks.</p>
IPR Policy	<p>2003 - 2007</p> <p>Romanian state Office</p>	<p><b>THE NATIONAL STRATEGY IN THE FIELD OF INTELLECTUAL PROPERTY 2003-2007</b> - the aim is to make Romanian IPR compatible and in harmony with the mechanisms of the EU, reaching the performance level</p>

		for Inventions and Trademarks	required by the development of a knowledge-based society.
3.	R&D specific financial and fiscal policy	2004 – present  Ministry of Public Finance	<b>Fiscal Code – Low nr. 571/22 December 2003:</b> total deductibility of R&D expenditures; <b>Fiscal Code 2005: the introduction of flat tax rate of 16% in 2005</b> indirectly affects positively the RDI activities. The fiscal incentives devoted to RDI do not include reductions effectively aiming at the companies' investment in RDI activities. Excepting the <b>exemption from the payment of local duties for research-development activities carried out within technological parks,</b> the exemption from taxes in case of equipment and know-how import was repealed by the new Law no. 345/2002 on the VAT and the exemption from taxes in case of patent implementation was repealed in 2002, although acknowledged as one of the mostly used fiscal incentives in the research and development field. A related measure envisages the <b>preferential payment of the taxes afferent to the wages of experts in software and information technology.</b>
4.	R&D specific education policy	2005 – present  Ministry for Education and Research (MER)	<b>CEEX program (R&amp;D Grants component), CORE, CORINT</b> programs which aim to correlate higher education, master and doctoral programs with R&D National programs; support the excellence projects for young researchers, mobility of researchers. The aim is to increase the number of PHD personnel to 80% of total researchers in comparison with 60% at present;
		2005 – present  Ministry for Education and Research (MER)	<b>POST-DOCS PROGRAMS</b> – come into force for the first time in the year 2005-2006, the financial support comes in terms of grants from CEEX program
		2002– present  National Agency for Qualifications in Higher Education and Partnership with the Economic and Social Environment (ACPART)	<b>ACPART</b> – is the national authority for establishing and updating the national framework for higher education qualifications, a specialized body subordinated to the MER, a public institution with legal personality. One of its main issues are related to <b>promoting the opening of higher education institutions towards the socio-economic environment</b> through cooperation actions among higher education institutions, economic operators and other organisations, aimed at developing specific partnerships, labour market research, an entrepreneurial dimension to Romanian Universities, as well as knowledge transfer.
5.	R&D specific employment policy	1999 – present	<b>National Plan for R&amp;D and Innovation; Core R&amp;D programs; CEEX Program (subprogram nr.2); Scientific Grant Programme, Sectoral R&amp;D Programme of MedC -</b>

		Ministry for Education and Research (MER)	all these programs have a component dedicated increasing to R&D personnel number (especially of young researchers) and improving the structure quality of the R&D personnel; stimulating research career. <b>CORINT</b> – sectoral program for <b>RDI mobility schemes</b> under international cooperation and partnerships.
<b>II. NON-R&amp;D SPECIFIC</b>			
<b>Finance Domain</b>			
6.	Financial and Fiscal Policy	2005 - 2006  Romanian Government	<ul style="list-style-type: none"> <li>• <b>GOVERNANCE PROGRAM 2005-2008 – chapter 12, Romanian Government</b></li> <li>• <b>PRE-ACCESSION ECONOMIC PROGRAM 2005 – 2006</b>, that is to be replaced by the <b>NATIONAL CONVERGENCE PROGRAM</b> after the accession in January 2007.</li> </ul>
7.	Macroeconomic Policy	2006  Romanian Government, Ministry of European Integration (MEI) and the Ministry of Economy and Commerce (MEC)	<ul style="list-style-type: none"> <li>• <b>Governance Program 2005-2008</b> - contains guidelines for policy in the different macroeconomic fields as : education policy ( chapter 5), ICT policy ( chapter 20), R&amp;D and Innovation Policy ( chapter 5), fiscal and budgetary policy ( chapter 12), industrial policy ( chapter 13), regional policy ( chapter 15).</li> <li>• <b>2005 and 2006 versions of PRE-ACCESSION ECONOMIC PROGRAM.</b></li> <li>• <b>NATIONAL REFORMS PROGRAM –2006</b>, action plan aiming at meeting the Lisbon Strategy criteria.</li> </ul>
<b>Human Capital Domain</b>			
8.	Education Policy	2005 - present  Ministry of Education and Research (MER)	<ul style="list-style-type: none"> <li>• <b>NATIONAL EDUCATION STRATEGY FOR 2006 – 2008</b> State budget: <ul style="list-style-type: none"> <li>• 2005: 2,099.7 million RON, 0,39% in GDP;</li> <li>• 2006 – 2008: total of 5,184.1 million RON</li> <li>• 2006: 0,5% in GDP (1,968.4 million RON).</li> </ul> <b>Strategic objectives:</b> <ul style="list-style-type: none"> <li>• Improving the quality and effectiveness of education and training systems in accordance with the EU standards;</li> <li>• Considerable growth in investment in education;</li> <li>• Facilitating the access of all to education and training systems;</li> <li>• Increasing participation in education and training within a lifelong perspective;</li> <li>• Increase of institutional capacity to absorb the EU funding;</li> <li>• Integrated approach to sustain the education, research and innovation.</li> </ul> </li> <li>• <b>DEVELOPMENT OF RURAL EDUCATION IN ROMANIA</b> – programs, regulations and opportunities for development of rural education. State budget:</li> </ul>

			<ul style="list-style-type: none"> <li>• 2005: 18.4 million RON;</li> <li>• Financed by the World Bank.</li> </ul> <p><b>SOCRATES II si LEONARDO da VINCI II programs</b> - support mobility of the students and academic personnel ; managed by National Agency for Community Programs in the Education and Training, under the MER. European system of transferable credits has been generalized in all Romanian universities.</p>
9.	Employment policy	2005 – 2010  Ministry of Labour, Social Solidarity and Family 2004 - 2010	<ul style="list-style-type: none"> <li>• <b>SHORT AND MEDIUM-TERM STRATEGY FOR LONG-LIFE LEARNING, 2005 – 2010</b></li> <li>• <b>NATIONAL STRATEGY AND ACTION PLAN FOR EMPLOYMENT 2004 -2010</b></li> <li>• <b>Labour Code</b> (2006 - present)</li> </ul> <p>Low relevance for RDI, could contribute to the increasing of public awareness in R&amp;D results</p>
<b>Innovation Domain</b>			
10	Innovation Policy		
	Generic	2006 – draft  Ministry of Economy and Trade	<p><b>POS - Sectoral Operational Program “INCREASE OF ECONOMIC COMPETITIVENESS”</b> - the priority axes are:</p> <ol style="list-style-type: none"> <li>1. <b>An innovative productive system</b></li> <li>2. <b>Research, Technological Development, and Innovation for Competitiveness</b></li> <li>3. ICT for private and public sectors</li> <li>4. Increased energy efficiency and sustainable development of the energy system</li> <li>5. Romania, an attractive destination for tourism and business</li> <li>6. Technical Assistance</li> </ol> <p><b>SOP</b> The priority axes of Romania’s competitiveness strategy are in full compliance with the lines of action of the <i>Commission’s proposal regarding the framework for Competitiveness and Innovation 2007-2013</i>, and take into account the guidelines put forward by the <i>European Commission for the cohesion policy for 2007-2013</i>. The budget for the 2007-2013 programming period is 2,240 million Euro, which represents 13.28 % of the EU contribution to the National Strategic Reference Framework.</p>
	Sectoral	2002 – 2005 2005 - present  Ministry of Economy and Trade	<p><b>NATIONAL PROGRAM TO INCREASE THE COMPETITIVENESS OF ROMANIAN INDUSTRY PRODUCTS</b></p> <p>Activities financed from the state budget:</p> <ul style="list-style-type: none"> <li>• Implementation and certification of quality and environment management systems;</li> <li>• Implementation and certification of health and labour safety management systems, social responsibility management systems, information security management systems and food safety;</li> <li>• <b>Support the endowments</b> and/or modernization of the existing testing labs, accreditation as well;</li> <li>• <b>Products certification and/or</b> ecological sealing;</li> </ul>

			<ul style="list-style-type: none"> <li>• Assimilation of new technologies and products, capitalization of RDI public investments and protection of innovation patents;</li> <li>• <b>Analysis and comparative assessments of manufacturing industry to be restructured, developed and revitalized, monitoring etc.;</b></li> <li>• Expositions and presentations of industrial products;</li> <li>• Registering and protection of trademarks, industrial designs and models etc.</li> </ul>
11	Other Policies		
	<ul style="list-style-type: none"> <li>• Industry Policy</li> </ul>	<p>2005 – 2008</p> <p>Ministry of Economy and Trade</p>	<p><b>NATIONAL INDUSTRY POLICY 2005 – 2008 and the associated Action Plan – main objectives:</b></p> <ul style="list-style-type: none"> <li>• Increase of competitiveness;</li> <li>• <b>Increase the role of RDI in economy;</b></li> <li>• Sustainable resource management and environment protection;</li> <li>• Professional training improvement and employment;</li> <li>• Stimulation of cooperation and industrial services, as well as the public-private partnership.</li> </ul>
		<p><i>2004 - present</i></p> <p>National Agency for Small and Medium Sized Enterprises</p>	<ul style="list-style-type: none"> <li>• <b>Government Strategy for supporting the SME development 2004 – 2008 - the main strategic Priorities are:</b> <ul style="list-style-type: none"> <li>• Creating of a business environment favourable to establishing and development of SMEs;</li> <li>• Development of SMEs capacity;</li> <li>• Improving of SMEs access to financing sources;</li> <li>• Improving of SMEs access to foreign markets;</li> <li>• Promoting of entrepreneurial culture and strengthening management performance</li> </ul> </li> <li>• <b>National multi - annual program for the period 2006-2009 for supporting SMEs for developing exports - the program pursues:</b> promotion of SMEs products and services into foreign markets; stimulation of communication and business partnership into foreign markets; training of entrepreneurs in the area of export promotion techniques; improving the access of SMEs to market information and facilitation of capitalizing this information on foreign markets. Costs regarding eligible activities for each selected beneficiary are partly supported from the state budget until 60% of value of each effected eligible cost.;</li> <li>• <b>Program for supporting investments of start-ups and SMEs in industrial priority sectors 2002 – 2006 -</b> Through financial not reimbursable allowances (FNRA), the program supports investments made by eligible beneficiaries in industrial priority sectors. FNRA covers till 40% of the project cost, and it is granted together with a Romanian Commercial Bank credit that covers 45% of the project cost, the beneficiary of the financing covering the remaining 15% of the project cost;</li> <li>• <b>National multi-annual program for the period 2006-2009 for supporting the access of small and medium sized enterprises to training and consulting services -</b></li> </ul>

			<p>Activities for which are granted budgetary allocations within the program are: facilitating the access of SMEs staff having decision and/or execution positions to organised training courses - management, marketing, strategy and planning, investment sources and financing methods, EU legislation and practices in the SMEs area for unfolding enterprise activity; facilitating the access to consulting services, for drawing up business and marketing plans, accessing financing sources, consulting in the area of standardisation systems certification, quality certification according to EU norms, in the area of internal and international co-operation (complementarily partnerships, outsourcing);</p> <ul style="list-style-type: none"> <li>• <b>National multi-annual program for the period 2006-2009 for informing and educating traders</b> - Program aims to support traders by granting not reimbursable financial allowances for: participation to professional formation/qualification courses in basic trade professions within the area of food industry; participation to courses regarding fundamental notions of hygiene needed in food trading activities; participation to professional specialization/improvement for gaining additional professional competencies and deepening specialty knowledge;</li> <li>• <b>National multi-annual program for supporting crafts and handicrafts 2006 – 2009</b> - Program supports through not reimbursable financial allowances the following eligible activities: participation to fairs and exhibitions, organized inside the country or abroad, with own stand or in association with other enterprises; drawing up and production of printed materials for promoting enterprise, edited in a foreign language with a large circulation; designing a site on the Internet for presenting applicant's activity and promoted product or service;</li> <li>• <b>Program for supporting SME development from food industry unfolded in co-operation with United Nations Industrial Development Organization (UNIDO)</b> - Project has the main objectives: setting up milk collection centers at European standards and introducing the system of quality assurance in the circuit farmer – milk processing enterprise; setting up training, development of production and technological transfer centers for farmers and SMEs with activity in the area of milk and milk product processing; increasing competitiveness of preserved vegetable and fruit products in the internal and international market through implementing consumer protection system and quality assurance system, diversification of production and introduction of cheap and modern production technologies in SMEs; support for setting up associations of processing from interest areas;</li> <li>• <b>CURAS Program</b> - (Clustering and Upgrading Romanian Automotive Suppliers) – Increasing the level of quality assurance in SMEs sector from horizontal auto</li> </ul>
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		<p>industry and setting up supplier chain (co-operation program between Romania and Flemish Government);</p> <ul style="list-style-type: none"> <li>• <b>EMPRETEC Program (co-operation between NASMEC, UNCTAD, and Ministry of Productive Activities from Lombardia Region)</b> - support for entrepreneurs for international marketing and export courses;</li> <li>• <b>"START"</b> - operational since 2004, it is dedicated to the entrepreneurial development for youth and to facilitating youth access to financing;</li> <li>• <b>The national multiannual program (2005-2008) to develop the entrepreneurial culture among manager women from the SMEs sector</b> The main objective of this program is to promote a system that facilitates women mobility on labour market and help them to get involved in private economic structures and also maintain the balance between family and work. Its tasks are : <ul style="list-style-type: none"> <li>• to stimulate self employment</li> <li>• to develop the entrepreneurial spirit among women</li> <li>• to raise the level of information about women entrepreneurship</li> <li>• to raise the number of women entrepreneurs within the business community</li> <li>• to create new start ups</li> <li>• equal access to the knowledge based economy.</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• Trade Policy</li> </ul>	<p>2005 - 2009</p> <p>Ministry of Economy and Trade</p>	<p><b>NATIONAL EXPORT STRATEGY</b> - R&amp;D and Innovation for promoting the export potential of enterprises. Necessary funds: <i>600 Mil Euro annually, out of which 200 from the state budget.</i> Main objectives:</p> <ul style="list-style-type: none"> <li>○ <b>Bridging technology gaps:</b> a more rapid deployment of advanced technologies in all economic sectors and the implementation of sustainable technological development patterns at sectoral level</li> <li>○ <b>Bridging competitiveness gaps:</b> increasing the capacity of enterprises to cope with the pace of technological evolution and competition at european and international levels</li> <li>○ <b>High value added exports:</b> the development of R&amp;D and innovation activities in enterprises, especially in high- tech domains</li> <li>○ <b>Towards global markets:</b> promotion of viable technological clusters, able to become competitors on the global market</li> </ul>
<ul style="list-style-type: none"> <li>• Defence Policy</li> </ul>	<p>2006 - present</p> <p>Romanian Presidential Administration, Ministry of Defence</p>	<p><b>ROMANIA'S NATIONAL SECURITY STRATEGY</b> – for the first time in 2006, the competitiveness and knowledge-based economy is prioritised as a national security issue in chp. 9.</p>
<ul style="list-style-type: none"> <li>• Consumer</li> </ul>	<p>2005 - 2008</p>	<p><b>THE STRATEGY OF THE NATIONAL AUTHORITY</b></p>

	Protection policy	ANPC - National Authority for Consumer Protection	<b>FOR CONSUMERS PROTECTION 2005-2008</b>
	<ul style="list-style-type: none"> <li>Health and Safety Policy</li> </ul>	<p>2004 – 2006</p> <p>Ministry of Public Health</p>	<p><b>NATIONAL STRATEGY FOR PUBLIC HEALTH 2004 – 2006</b></p> <p><b>VIASAN – Program for Life and Health</b> (since 2001) - Aims to promote and support basic-strategic-and applied medical research, with the view to understand mechanisms of man’s falling sick, in treatment of pathological illnesses with great impact upon population. Budget: 7.01% of the total budget of NPRD in 2005; Co-finance: 9.5%</p>
	<ul style="list-style-type: none"> <li>Environment Policy</li> </ul>	<p>2005 – 2007</p> <p>Ministry of Environment and Waters Management</p>	<p><b>ROMANIAN NATIONAL STRATEGY REGARDING THE CLIMATE CHANGES 2005 – 2007</b> – chapter. 10 describes the activities to incorporate climate change issues in education and research, and to increase the level of awareness and public participation of stakeholders in Romania on climate change issues.</p>
	<ul style="list-style-type: none"> <li>Regional development Policy</li> </ul>	<p>2007 – 2013</p> <p>Ministry of European Integration</p>	<p><b>REGIONAL OPERATIONAL PROGRAM “Regional Development” 2007-2013</b> - implements important elements of the <b>National Strategy of Regional Development</b> of the <b>National Development Plan</b>, contributing, together with the other sectoral programs, to the accomplishment of the general objective of the national regional strategy, namely to reduce the disparities between Romania’s regions.</p>
	<ul style="list-style-type: none"> <li>Competition policy</li> </ul>	<p>2006 - present</p> <p>Competition Council</p>	<p><b>STATE AIDS SCHEMES FOR RDI:</b></p> <p>The national secondary legislation on state aids for research-development is fully complying with the relevant EU legislation by <b>Government Decision 651/24.05.2006 regarding the approval of policies in state aid field for the period 2006-2013.</b></p> <p>The present regulations stipulate that the <b>state aids for RDI</b> are part of the state aid category, which requires <b>ex-ante notice</b> with a view to acquiring the authorization by the European Commission. <b>Exceptions</b> are only the following state aid categories: the <b>state aids for research-development provided to SMEs, de minimis state aids.</b></p>
	<ul style="list-style-type: none"> <li>Other Policies</li> </ul>	<p>2006 - draft</p> <p>Ministry of Public Finance</p>	<ul style="list-style-type: none"> <li><b>NATIONAL Program Antipoverty and Social Exclusion, 2002-2004, National Commission Antipoverty</b></li> <li><b>Sectoral Operational program for Human Resources Development</b></li> <li><b>NATIONAL STRATEGIC REFERENCE FRAMEWORK 2007 – 2013</b> – the key aims are to strengthen the strategic focus of Romania’s Economic and Social Cohesion and Regional Policies and to make the correct and appropriate linkages to the European Commission policies, notably the Lisbon Strategy, which builds policies for economic growth and the creation of jobs.</li> </ul> <p><b>The Vision:</b> <i>To create a competitive, dynamic and</i></p>

			<p><i>prosperous Romania.</i></p> <p><b>NSRF Objectives:</b> <i>To reduces the social and economic development disparities between Romania and the EU Member States. To reduce the disparities with the EU by generating an additional 10% increase in Romania's GDP by 2015.</i></p> <p><b>Specific objectives: Operational Program on Competitiveness</b> (managed by the MEdR; described above)</p> <p><i>Allocation of EU funds on 4 thematic priorities, one of which being the Improving <b>Long Term Competitiveness</b> of the Romanian Economy ~ 15% (from the total 17,3 mld. EURO)</i></p>
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*Source: S. Sandu and A. Vass compilation, 2006*

## 5. Coherence between main policy objectives and priorities, and policy instruments

In general, R&D instruments are set up in order to respond and implement the main R&D policy objectives. Multitudes of R&D programs mentioned in the previous table correspond to different R&D objectives. The Research for Excellency Program (CEEX) launched in 2005, operates 732 ongoing projects in 2005. The aim of the program is to sustain the stimulation of economic competitiveness and to link R&D to priorities specific to ERA. In particular it is designated for preparing the participation of Romania in FP7. INFRATECH is dedicated to the development of the infrastructure required technology and innovation transfer. Ten of the fifteen programs within the National Plan for Research, Development and Innovation (NPRDI ) aim to rise R&D and innovation capacities in specific economic fields: agriculture, environment, health, energy, transportation, industrial sectors, quality infrastructure, informational technologies, bio-technologies, micro and nano-technologies, technologies for aeronautics and space.

Complex R&D projects, support ample projects for developing the research activity, the human potential and the infrastructures involved in national, regional and international partnerships; the cooperation between universities, research institutes and companies has been imposed. Development of human resources for research – sustaining the training, formation, mobility of researchers and the increase of the research career attractiveness through promoting the R&D programs led by young (doctoral and post doctoral courses) through increasing the level of qualification in the management of RDI programs and institutions and the internal mobility of young specialists, as well as through encouraging the return of the Romanian researchers from abroad.

In 2005 the National Authority for Scientific Research (NASR) started an ample action for sustaining the formation and consolidation – at a national level – of the technological platforms, based on public-private partnerships in the strategic long-term orientation of research. The development of scientific/technical careers through the interaction between S&T education and R&D activities is specifically promoted by publicly funded R&D programs, such as: the Program of grants for scientific research.

Accomplishment objective of encouraging the participation of the private sector in R&D activities has been intensified in 2005 by sustaining and consolidating technological platforms instruments based on public-private partnership and consensually deciding upon common R&D agenda strategies on the medium to long term and by Plan for Industrial Policies for 2005-2008 and the National Export Strategy containing objectives and general actions specific to R&D but there are not mentioned specific programs for their implementing.

Through the Operational Sectoral Plan (POS), priority axis 1, some major intervention areas are considered, including access to SME credits, innovative financial instruments, investments through seed capital, training and education programs for the encouragements of the innovative and entrepreneurial spirit, development of the innovation infrastructure.

The set up of a venture capital fund for innovative and start-up SMEs, and developing R&D clusters is plan just in 2007. All of these measures also have funds associated from EU and internal sources.

In the Strategies and programs in education, some action directions are specified which contribute to consolidating research potential. Thus, for 2006 and 2007, the following are planned: adapting the university education system and reforming the curriculum of technical and scientific disciplines to new economic demands and consolidating the National Framework of qualifications in Higher education, correlating university post-university R&D programs through the excellence R&D program and grants. National and international researcher mobility will be intensified through mobility programs supported through CORINT, CEEEX – module III and through the financing of firms that use researcher teams.

A process for correlating instruments to promote R&D and public policies is going on at present, especially regarding increasing investments in research, assuring a business environment that is more favourable to innovative SMEs, and also development of research services through the improvement of access of the industry to competitive research teams. In this sense, research facilities have been promoted, for integrated research platforms with users from research and the industry, in some programs and common projects, to assure compatibility with similar European platforms.

The new approach to innovation leads to an orientation toward developing instruments that allows, on the one hand, increasing the efficiency of cooperation schemes – between universities, research centers and companies – and, on the other hand, facilitation of direct transfer of knowledge and technologies between the different actors on the market, that is, centers for technological transfer and creating spin-offs and spin-outs.

There is the risk to perform parallel or overlapping research projects due to such a big number of projects that are annually ongoing under the different national and sectoral programs, covering 50 fields of research.

## 6. Policy mix instruments and target groups

### Policy instruments and broad routes to increase R&D investments

Main policy instruments in place:		ROUTE 1	ROUTE 2	ROUTE 3	ROUTE 4	ROUTE 5	ROUTE 5
		Promote establish. of new indigenous R&D performing firms	Stimulate R&D investment in R&D perform. Firms	Stimulate R&D investment in firms non-perform R&D	Attract R&D perform firms from abroad	Increasing extramural R&D carried out in cooperation with public sector	Increase R&D in the public sector
R&D Policy							
	NPRDI 2004-2006; 2007-2013	X	XX	X		XX	XX
	IMPACT	X	X	X		X	X
	CEEX		X			X	X
	SECURITY				x		x
	INFRATECH	x		X		X	X
	CORE/NUCLEU		X				X
	THE GRANTS						x
	Sectoral Plan for RDI in industry 2006 – 2008	X	X			X	X
R&D Fiscal	Fiscal Code 2005		X	X			
R&D EDUC	CEEX programme (R&D Grants component), CORE, CORINT						X
	POST-DOCS						X
	ACPART						

<b>Finan. and Fiscal Policy</b>	<b>1.Pre-accession economic program 2005 – 2006</b> <b>2.National Convergence Programme</b>	<b>x</b>	<b>x</b>	<b>x</b>	<b>x</b>	<b>X</b>	<b>x</b>
<b>Macroecono. Policy</b>	<b>1.National development plan for 2007-2013</b> <b>2. National Reform Plan</b>	<b>x</b>	<b>x</b>	<b>x</b>	<b>x</b>	<b>x</b>	<b>X</b>
<b>Innovation Policy</b>							
	<b>POS - “Increase of economic competitiveness”</b>	<b>x</b>	<b>x</b>	<b>x</b>	<b>x</b>	<b>x</b>	<b>x</b>
	<b>National program to increase the competitiveness of Romanian industry products</b>	<b>x</b>	<b>x</b>	<b>x</b>	<b>x</b>	<b>x</b>	<b>X</b>
<b>Other Policies</b>							
	<b>National Industry Policy 2005 – 2008 and the associated action plan</b>	<b>x</b>	<b>x</b>	<b>x</b>	<b>x</b>	<b>x</b>	<b>X</b>
	<b>.All programs supporting SMEs mentioned in Tabel nr. 1</b>	<b>x</b>	<b>x</b>	<b>x</b>	<b>x</b>	<b>x</b>	<b>X</b>
	<b>Romania’s National Security Strategy</b>						

## 7. Balance within R&D policy mix

**Table nr.3 : Assessment of importance of R&D policy instruments in place in 2005**

Instruments <sup>2</sup>	mil. Euro 2005 <sup>3</sup>	Criteria				
		Overall contribution to increase	Impact on specific aspects of NIS or	Public attention/attention by policy	Volume of public funding involved;	Beneficiary of a shift in public
NATIONAL R&D & I DEVELOPMENT PLAN 2004-2006	56.61	XX	XX	XX	XX	XX
1. RELANSIN	7.0	XX	XX	XX	XX	XX
2. INVENT	2.2	X	X	X		x
3. MATNATECH	4.19	X	XX	XX	X	X
4. AMTRANS	4.64	XX	X	X	X	X
5. AGRAL	5.57	XX	X	XX	XX	X
6. MENER	3.84	XX	X		X	X
7. VIASAN	3.91	X	X		X	X
8. BIOTECH	4.0	X	X		X	X
9. AEROSPATIAL	3.59	X	X		X	X
10. INFRAS	1.72	X	X		X	X
11. CALIST	3.26	X	X		X	X
12. CERES	6.45		X		XX	X
13. INFOSOC	1.53	X	X		X	X
14. CORINT	4.26	X	X		X	X
15. SECURITY	0.45		X			X
RESEARCH FOR EXCELENCE (CEEX PROGRAM)	36.0	XX	XX	XX	XX	XX
NUCLEUS/CORE PROGRAM	16.44				XX	
INFRATECH	2.76	XX	XX	XX		X
GRANTS MER PROGRAM	8.83		XX	XX	XX	XX
SECTORIAL R&D PROGRAM OF MER 2005-2006	2.70	X	X			
SECTORIAL R&D PROGRAM OF INDUSTRY 2006-2008	28.5	XX	XX	XX	XX	XX

<sup>2</sup> We had to select the instrument for that we have budget data

<sup>3</sup> Own calculations taken into consideration the average exchange rate for 2005

## 8. Emergence of R&D policy mix

Romanian policy makers recognize, generally speaking, that R&D and innovation are the key drivers of the economic growth and that there is a consensus as concerns the necessity of a comprehensive policy mix approach, envisaging the human resources, the science base, industry, the macroeconomic and other related policies. The main initiative of policy mix and the efforts of integration other governmental bodies or stakeholders into this approach have been made by the authority in charge with R&D policy, National Authority for Scientific Research<sup>4</sup> (NASR).

Assuming the responsibility for the formulation, implementation, monitoring and assessment of R&D and innovation policies, NASR is strongly committed to gradually improve the method of a policy mix construction by an active implication of all ministries and other governmental, professional and techno- scientific bodies, in order to have a mutual sustainability of R&D and of innovation objectives and infrastructures and to align them “to the European practice of an integrated approach to R&D and innovation activities”.

MER<sup>5</sup> - NASR has the specific responsibilities in the field of research, technological development and innovation and ensures the coordination of the NPRDI, which is evolving in conjunction with several other relevant ministries, professional bodies, private organizations mentioned more detailed in chapter no.9. In developing its policies, MER-NASR is advised by a number of bodies, one of which is the Advisory Board for R&D and Innovation, consisting of representatives of science, technology and industrial communities.

Unfortunately, there still is a lack of coordinating bodies at higher policy level. The Inter-Ministerial Council for Science, Technology and Innovation, according to the 57/2003 law should provide a framework for an inter-ministerial policy dialogue on R&D, being responsible for ensuring the compatibility of R&D and innovation policies with other social and economic policies and the evolving of the legislative framework for implementing R&D and innovation activities doesn't work properly. Another coordinating body, The National Council for Science and Technology Policy, which is to be chaired by the Prime Minister and will have the task of setting up the long-term strategic R&D priorities, will be established in 2007.

The accession to the EU in 2007 and the need of satisfying highly specific entry requirements has had a tremendous influence on the shape and pace of policy mix in Romania, especially in terms of the adoption of broad EU targets; the gearing of R&D agendas to those mirroring the EU Framework RTD Programmes; and the adoption of policy mechanisms that are commonplace both at an EU level and in the context of other national settings. Many of these developments will undoubtedly have a beneficial effect on policy mix in Romania, especially in terms of the convergence with EU levels and practices and the ability of Romanian R&D and innovation actors to compete at EU level.

There was some concern, however, that the desire for convergence might lead to the adoption of directions and practices unsuited to the particular configuration of actors within the

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<sup>4</sup> National Authority for Scientific Research (NASR) was established in July 2005 under the auspice of the Ministry of Education and Research

<sup>5</sup> MER was created in 2001 out of the former Ministry of National Education and the National Agency for Science, Technology and Innovation

Romanian innovation system and the needs of the Romanian economy and society in general. The choice of an appropriate policy mix is context specific and demands a highly selective approach to the adoption of suitable policy instruments.

Elaboration of the new National R&D and Innovation Plan -NPRDI -for 2007-2013 has been the first exercise of policy mix process based on foresight vision and SWOT analyses of the present state of the R&D and innovation system, as part of the policy formulation of the strategic lines. The involving of relevant stakeholders in selected relevant priorities ensures a joint commitment to their realization and facilitates the development of the networks and the relationships between R&D and the innovation actors. Valorising the good practice of previous National R&D Plan elaboration, the new policy mix construct benefited by external sources of expertise, experienced the familiarity of indigenous stakeholders with global trends and good practices. The participation of all relevant stakeholders and foreign sources of expertise in the assessments of innovation system performance and formulation of future visions of policy mix grants the efficiency of NPRD implementation.

The new NPRDI is the main instrument for the implementation of the 2007-2013 National Strategy for R&D, with the objective of creating knowledge and increasing the competitiveness of Romanian economy and of the social life quality in accordance with the strategic objectives formulated by the National Plan for Economic Development for 2007-2013. The experience capitalized in implementing of the National R&D Plan for 1999-2006 contributed to designing more realistic and accessible targets, taking into account the Romanian absorptive capacities for R&D and innovation funds, either from national or foreign sources.

The main contributions of the new R&D National Plan are the following: reconsideration of R&D-related priorities for 2007-2013; modification of the procedure for establishing the financing demand for the different components of the Plan; new mechanisms for developing collaboration between stakeholders and partnerships between the different actors in R&D ; set –up a monitoring and evaluation system of the performance of individual initiatives and delivering results of relevance to broader assessments of overall policy mixes; increasing the role of universities and the interplay between research and teaching functions; enhancing the quantity and quality of scientific and technological education and training activities and attracting young people to enter into S&T and research careers; establishing new mechanisms for competitive financing of research entities. The new model of financing is based on feedback between research performance and on the degree to which strategic objectives are achieved. The model includes target values for indicators measuring the most relevant strategic results. Allocating investments for research, development and innovation is done through a competitive system on the basis of scientific relevancy, importance (economic, social and environmental), and project feasibility (the potential of absorption of R&D results), with the objective of obtaining competitive advantages in society.

## 9. Governance of the policy mix

The model of policy mix governance is very complex in Romania; many institutions, at different levels, have specific responsibilities in elaboration, monitoring, implementation and assessment of R&D and innovation Policy.

At the **PARLIAMENT** level, there are two COMMISSIONS: The Senate Commission for Education, Science and Youth and The Chamber of Deputies Commission for Education, Science, Youth and Sport, which debate and approve draft laws and other legislative documents related to science, education, sport and youth.

At the **GOVERNMENT** level, the Ministry of Education and Research has the main responsibility in the design and implementation of innovation policies and collaborates with other 9 ministries, with R&D and innovation responsibilities in their specific fields. These ministries co-ordinate a network of 34 National R&D Institutes, 18 of which are under the direct control of the Ministry of Education and Research.

There are, also, different government-subordinated agencies involved in innovation and two other government bodies for the protection of industrial property and copyright, which make together the *National System for the Protection of Intellectual Property*. Romania is a member of the World Intellectual Property Organization (WIPO) and concluded a Co-operation Agreement with the European Patent Organization (EPO) on the extension to Romania of the effects of the European Patents. The Romanian Standardization Agency (ASRO) is in charge of standardization and quality certification, and the Romanian Accreditation Association (RENAR) is in charge of the development of a national quality system based on EU-compatible practices and infrastructures, and the mutual recognition of Romanian products and services on the EU market. Both agencies are coordinated by the Ministry of Economy and Trade and ensure the *National Quality System*.

Some specialized strategic agencies for R&D coordinate R&D activity in their respective fields: the National Agency for Atomic Energy - the government body that promotes the development of the nuclear domain and co-ordinates scientific research and co-operation with international organizations in the area; and the Romanian Space Agency (ROSA) - the national body coordinating space activities and the National Space R&D program ROSA is authorized to establish R&D centers in support of the specific objectives of the National Space R&D Program and to channel funding for space-related research, in co-operation with the Science Council for Aeronautics and Space of the Advisory Board for R&D and Innovation.

At the national level there are some **R&D CO-ORDINATING INSTITUTIONS** as follow:

**Romanian Academy** –structured in 14 scientific divisions specialized in technical sciences, basic sciences and socio-human sciences. It has an own national network of research institutes and centers, which participate in national RDI programmes and own research programs. In 2001, the European Commission has recognized two of the Romanian Academy Institutes as centers of excellence.

**Branch academies:** the Academy of Medical Sciences (23 institutes and research centers, 12 clinics affiliated to medical universities) Academy of Agriculture and Forestry Sciences (25 institutes and research centers, 91 research and production units).

## **CONSULTATIVE BODIES TO THE MINISTRY OF EDUCATION AND RESEARCH**

- Advisory Board for R&D and Innovation – includes most representative personalities of the S&T community, from institutes and universities, as well as high-level representatives from the technological community, industry and services.
- National Council for Scientific Research in High Education – includes representatives of the academic Community
- Strategic Orientation Councils related to the programs of the National RDI Plan –
- Select and update the priorities/objectives of the respective programs.
- Trilateral Commission for Social Dialogue – provides the constitutional framework for consultation with the social partners, i.e. unions and patronages.
- Council for Research Grants of the Romanian Academy – includes representatives of the Romanian Academy research divisions.

Starting with 2007, a new coordinating body will be established -Inter-ministerial Council for Science, Technology and Innovation – focused on correlation RDI policies with other government strategies and programs. A Minister based on a State Secretaries of various ministries will chair it.

**The Ministry of Education and Research (MER) by the National Agency for Scientific Research (NASR)** is the specialised body of the Romanian central public administration, whose mission is to formulate, monitor the implementation and assess R&D and innovation policies at government level and has primary responsibility for R&D and innovation policy.

The Ministry of Education and Research acts for the promotion of general strategies aiming to development of the national R&D and innovation system and strengthening its capacity, diffuse and transfer S&T results by enhancement of R&D and innovation activities and services in all the economic and social sectors and their orientation towards stimulation and response to economic demand. Its responsibility is also focused on development of human resources and institutions specialized for R&D and innovation activities and services, stimulation of the innovation climate and absorption capacity of business sector for R&D output and international integration of Romanian Research Area into European Research Area.

Professional representatives and private associations are invited to join several consultative bodies, such as the Advisory Board for R&D and Innovation, Trilateral Commission for Social Dialogue, but their involvement is still very weak. The most representative employers' organizations are: The Confederation of Employers in Industry, Services and Trade; the Alliance of Employers' Confederations in Romania, the Union of Romanian Employers.

The following NGOs play a significant role in R&D policy design in Romania: The Academy of Technical Sciences (AST); the Romanian Economic Society (SAR) The Romanian Centre for Small and Medium-Sized Enterprises (CRIMM); The Romanian Centre for Economic Policies (CEROPE).

The cabinet of the Prime Minister have organized a special Working Group for identifying the most adequate ways and means for the improvement of the business environment, including the elimination of administrative barriers. The group includes high-level representatives of 20 ministries and government agencies, including the secretary of state for research from MER, as well as representatives of significant private sector associations such as: The Council of Foreign Investors, The Chamber of Commerce and Industry The Confederate Employers of Industry, Services and Commerce ; The National Association of Importers and Exporters of Romania.

One of the most important issues on the agenda of the Group is the promotion and the development of R&D and innovation activities in the private sector firms and enterprises, including their improved participation in public R&D programmes.

It is rather difficult to assess in what extent NASR plays the overall role as a coordinator of R&D and innovation activity at national level and which is the degree of responsibility of other bodies. It is also difficult to assess the degree of overlap and complementarity regarding implications and responsibilities of NASR and of other ministries. The Romanian Academy and branches academies are responsible for their own R&D policy and The National Council for Higher Education Research has also the specific attributes focused on R&D policy in universities. Similarly, the Ministry of Public Administration and Home Affairs has responsibility for an Industrial and Software Parks Program. The Ministry for Information and Communications Technology also plays an active part in measures designed to stimulate the growth of the ICT sector and the diffusion of ICTs,

In the innovation field, the initiatives to stimulate entrepreneurship and create a viable and open business environment favourable to start-ups and the further growth of SMEs, including new technology-based firms (NTBFs), are the responsibility of the Ministry of Economy and Commerce and the National Agency for Small and Medium Enterprises and Co-operatives. Similarly, the Ministry of European Integration and the eight Regional Development Agencies have the responsibility for schemes such as the Romanian Network for Innovation and Technological Transfer, and the Ministry of Public Administration and Home Affairs has the responsibility for an Industrial and Software Parks Programme. The Ministry for Information and Communications Technology also plays an active part as concerns those measures designed to stimulate the growth of the ICT sector and the diffusion of ICTs.

Even if the relationship between R&D, innovation and industrial development were strictly linear and unidirectional, it would still be difficult to allocate responsibility for innovation within governance systems that conventionally contain two ministries broadly responsible for education and science, on the one hand, and industry and trade, on the other, as it is the case in Romania. The reality is that the complex relationship, which exists between these activities, makes the division of responsibilities even more problematic. The symbiotic relationship between them, however, demands that careful consideration be given to their mode of governing, with communication between ministries and a mutual commitment to joint action the key to success.

Whatever the division of responsibilities between ministries for R&D, innovation and industrial development, they always ensure that adequate mechanisms are in place to guarantee effective communication and joint actions. According to the R&D and Innovation Law 57/2003, the interaction among policy instruments at a higher policy level is the responsibility of the Inter-Ministerial Council for Science, Technology and Innovation, which should provide a framework for an inter-ministerial policy dialogue on R&D, ensure the compatibility of R&D

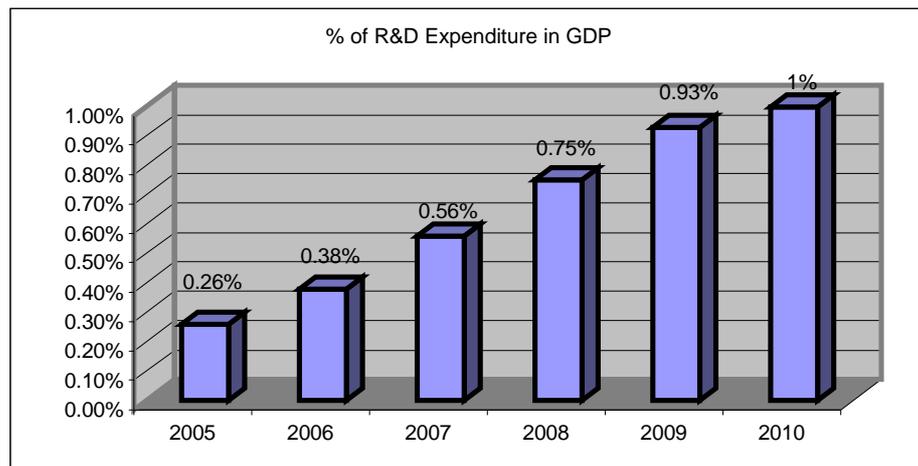
and innovation policies with other social and economic policies and develop the legislative framework for implementing R&D and innovation activities. Another body, the National Council for Science and Technology Policy, will be chaired by the Prime Minister, with the task of analysing long-term strategic R&D priorities. Unfortunately, the first body had a weak activity and the last one will be established only in 2007.

<b>R&amp;D system in Romania ( 2006 – 2007 )</b>				
<b>Public sector</b>	<b>Romanian Parliament</b>			
	Speciality Commissions			
	<b>Romanian Government</b>		<b>R&amp;D experts</b>	
<b>Policy design</b>	Ministry of Education and Research National Authority for Scientific Research	Other ministries	Romanian Academy	Branches Academies
<b>Advising</b>	National Council of Research			
<b>Instruments</b>	National Plan of R&D and Innovation			
	STRUCTURAL, THEMATIC, TECHNOLOGIC PRIORITIES			
<b>FINANCING AGENCIES</b>	UNEFISCSU (CNCSIS), CNMP, IFA, AMCSIT, ASR AND OTHER PROGRAM MANAGEMENT UNITS			
<b>Public sector organizations</b>	Universities	NIR&D	Institutes	Other Institutes
<b>Romanian Research Area</b>				
<b>Private sector Organizations</b>	Accredited Universities	R&D Instituts	Enterprises	Fundations, family associations

Source : Anton Anton, president of NASR : Research-Development and Innovation, CNCSIS, Iasi, 2006

## 10. Interactions between policy objectives and instruments<sup>6</sup>

The policy makers have an optimistic vision regarding growth of R&D intensity till 2010 as we can see from the following graph.



Source: Ministry of Education and Research

The direct instruments, as NPRD and other programs mentioned in the Table nr.1 would have a great positive impact on R&D intensity if implemented effectively. But a sub-optimal allocation of financial resources for R&D to the selected priorities or use of inadequate economic policies (financial, fiscal) could have a negative effect on R&D intensity.

The objectives of the main Romanian instruments as Economic Program of Governance, National Development Program, National Programs of Reforms (Lisbon Strategy), National Strategy of Export, and Operational Programs for Structural Funds Implementing are interrelated. Each of this policy instruments includes a special chapter focused on R&D and Innovation, being recognized as important in achieving the strategic objectives.

The implementation of these programs can be realized in a beneficial or inefficient way. Risks include keeping low visibility of the R&D system and its needs for financing and human resource allocation, maintaining the separation between private, academic (including universities and research institutions) and governmental research (R&D programs with precise socio-economic destinations linked to development objectives at the national and international levels).

The urgent problem of the Romanian NIS is the **strengthening of the connection between public and private research and the correlation with industrial and fiscal policies** by harmonized mechanisms and procedures that can lead to synergies and facilitate a mutual relationship. Research must be able to attract more resources from the private sector, and the

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<sup>6</sup> An important contribution to this chapter has Andreea Vass, Advisor in Department of Economic and Social Policies, Romanian Presidency Administration

private sector must be motivated to finance research by the elimination of the present barriers. The design of R&D policies must not overpass connecting the rethinking of the policy system with the restructuring of the institutional system.

Implementing successful R&D policies must be done on the basis of creating a centralized institutional framework that will monitor, analyse and synchronize these policies. In all countries that have had good R&D results recently, concerted measures have been taken by all decision makers and, in most cases, some form of government-monitored centralized system was put into practice.

There is a need for a clear medium-to-long-term vision regarding by whom and how resources can be managed in the R&D system. Two restructuring plans can be identified: at a horizontal level, there is a need to connect resource allocation with monitored results and priority decisions, within the framework of non-hierarchical collaboration; on a vertical level, there is a need to gradually eliminate useless steps in financing the system – main, secondary, and tertiary financing body – that can bring efficiency and flexibility.

In the context of R&D system reformation and the R&D legislative-institutional framework in Romania, the following specific action can be taken: implementing modern management of R&D units, based on economic and competitive principles that would solve the problem of the inefficiency of some research institutions.

The policy of **allocating European structural funds** and their rate of absorption, especially structural funds designed to develop human resources and support innovation and regional development (areas where links with R&D activities is direct) is a good opportunity to increase R&D financing.

Allocation and absorption of structural funds is a problem of economic policies that is currently under the jurisdiction of a number of ministries, who must actively collaborate, both in co-prioritizing and in allocating the internal financial effort within Romania's economy. An actor that must be better involved in all such efforts is the Ministry of Finance.

State aid policy and methods of using permitted instruments, so that they can assure development of the innovation and research potential and could have a positive effect on R&D intensity.

The problem is thus reduced to attracting actors to the collaborative circuit. The Ministry of Industry, that has – along with the MFP – an important role in determining policies in the area of state aids - could cooperate with the MEC (and representatives of university and academic research) in determining the directions that can receive state aid in Romania in the time right after accession (according to existing and expected legislation in the EU). This means that analyses and studies must be rapidly done as a basis for MEC / research system proposals, and then the construction of a medium-to-long term program for awarding the aids within the limits of community laws and for objectives permitted and desirable to promote sustainable development of the Romanian society within the EU.

Opportunities offered by the ERA must be used. At the same time, we must find the best balance between the following two options for investing in R&D: either invest massively in costly infrastructure, or invest in mechanisms and programs that will facilitate access to similar infrastructure already existing at the regional or European level?

**Structural Funds**, as well as other similar EU financing programs, support projects that encourage, among other things, technology and know-how absorption by SMEs in all

industries. Romania fits all convergence objectives, and therefore will be able to access important non-reimbursable funds from the communautaire budget. From the overall fund planning (see table III.1.8.), one can see that most attention is given to NDP priorities regarding infrastructure and rural development.

**Increasing economic competitiveness** is the priority that has a direct impact on R&D systems. 10% of funds are given to this priority, but there are no data about how much of this will directly enter R&D systems. In order to have a real effect on developing the innovation infrastructure, structural funds will have to be redirected towards projects coordinated with the objectives of the strategy for regional development. Therefore, within the framework of the Sectorial Operational Program (POS-Competitiveness), priorities, measures and actions have been identified that will lead to increased competitiveness: supporting the application of R&D in the manufacturing sector and increasing dissemination in innovation and marketing; stimulating investments in R&D infrastructure; Consolidating research cooperation between universities, research institutions and the industry; supporting the use of information technology; developing and increasing the efficiency of modern electronic public services (e-Government, e-Education and e-Health); promoting e-business.

One of the elements that investors and management must increase in order to support business performance is technological transfer. Many investments in this area have the objective of reducing the technological gap between the company and the main actors on the market, in order to increase profitability. Romania still has a problem with productivity and the lack of economic performance especially among SMEs, and a main cause is the poor technological outfitting. In Romania, this niche must be extended to include small firms with viable business plans, based on innovative ideas, not only well-positioned firms that want to attain a leadership position.

The bi-directional relationship between the performance of the R&D system and Romania's internal environment (a context external to the R&D system) is largely influenced by the correlation of all policies that can affect, directly or indirectly, the system performance.

On the one side, the system is positively influenced by input quality (human and financial capital) only if educational offer is correlated with the demands of the system and an efficient investment model. On the other hand, defining optimal performance for the R&D system in Romania must not be done in isolation, but rather by analysing real contributions of the system to attain the objective of creating a dynamic and efficient macroeconomic environment. In order for this would not remain at a declarative level, the growth of industry competitiveness through innovation and technological transfer can only be achieved through correlating the objectives of the R&D strategy with macroeconomic policies. Although objectives are very clearly defined in the governing program, it is not so evident how the R&D policies will coordinate with other government policies and strategies, as well as the way different governmental institutions and / or agencies will coordinate with each other.

MER – NASR, together with MEC, NASMEC, and other economic ministries, actively participate in the works of the Council for Industrial Policies, which created the Document and Action Plan for **Romania's Industrial Policy in 2005-2008**. Correlated with the other policies and strategies of the national economy, Romania's industrial policy has the objective of increasing the role of research, development and innovation. According to this strategy, industrial policies will continue to focus on consolidating and encouraging factors that lead to competitiveness, such as human capital, research, innovation and entrepreneurship and among

factors that will have a major influence in attaining the strategic objective of industrial policy, we find sustaining research-development and innovation, as well as the infrastructure for evaluating the conformity of industrial products and services. Within this strategy, special attention has been given to the R&D sector in order to obtain competitive advantages and to decrease development gaps between regions in Romania and between these and regions in the EU. Although some measures have been planned to increase R&D and innovation activities in industry, the economic performance of enterprises in the industrial sectors show poor correlation and implementation of R&D policies.

In order to correlate R&D policies with other governmental policies, MER – NASR has assured a section specific to R&D within the document regarding the **National Export Strategy** (SNE), prepared under the coordination of the MEC and CCIR. Among strategic concerns identified in the SNE there is Research and development, innovation and technological transfer in the favour of exporters (Strategic concern no. 10). Therefore, in order to stimulate R&D the following development directions are suggested: modernizing technologies or introducing new ones in traditional sectors such as food, clothing, furniture, metal processing, chemical industry, machining industry, in order to align quality and competitiveness of Romanian to European standards.

The R&D and innovation system plays a special role in the regional development strategy, as it is one of the main factors with a direct influence on the level of R&D in the regions. In order to assure sustainability of regional development, the strategy includes a series of measure related to R&D field.

Another highly relevant indirect RDI instrument with positive impact on the R&D budgetary funds and also on the private RDI intensity is the **new Fiscal Code**. It has introduced the flat tax rate of 16% on profits and revenues (from 25%-45% in 2004), and also diminishes scarcely, year by year, the social insurances burden on the labour market (from 49.5% in 2004 to 42% in 2013). The relevance of this measure for the RDI intensity may be translated into more funds left available at the business players for their own decision-making for future investments, within which RDI plays a strategic role. The positive effects will be more and more obvious on the medium and long run.

The EU accession process imposes as a major objective for Romania to focus on the development of a more dynamic and competitive economic environment, able to assimilate and develop high technology domains and to respond to strategic demands for long term development. In this respect, Romania oriented its strengths towards the SME development public policies that gathers the direct and indirect RDI instruments and enhances them in order to push up the SME competitiveness and the export capacity of the Romanian business environment. The positive outcomes are more and more evident in terms of bridging the technological and competitiveness gaps and in terms of higher exports value-added trough: systematic campaigns promoting the innovation culture, elaboration of technological development strategies at spectral level, direct support to enterprises for introducing and applying good managerial practices for technological development and innovation activities, support for the development of a structured network of national and regional providers (infrastructures and services) specialized for technology transfer and innovation services, including scientific and technical information and assistance, including R&D projects.

Effect upon Policies	S&T Investment	Human Resources	Education Policies	Industrial R&D	Advanced Tech	Regulatory Form	Regional Policies	SME Policies	R&D Tax Credits	SBIR	IPR Law	Immigration Policy
↗		+	+	+	+		+	+				
↘												
S&T Investment		+	+	+	+		+	+				
Human Resource policy	+		-	+/-	-							
Education policy		+/-		+	+						-	-
Industrial R&D	-				-						-	-
Advanced Technologies	+	+	+	+			-	+			+	-
Regulatory form		-	-	-	-							
Regional Policies	-	-	+	+/-								
SME Policies	+			+								
R&D Tax Credits				-	-							
SBIR		+		+				+				
IPR Law			+	+	-							
Immigration Policy	-	+/-	+	-	-							
University-Industry Links	+	+	+	+	+	+	+	+				

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