R&D Status in Romania
Romania

- is the **second largest country** in the Central and Eastern Europe (after Poland);
- it **has a population of 22 million people**;
- it benefits from a **strategic geographic position**;
- it benefits from an **educated and low-cost labor force**;
- it has important **natural resources resources**.

**Economy**
- Romania entered transition period in 1990;
- After 2000 Romania started a phase of high growth (with a record of 8.4% in 2004) and disinflation;
- The privatization process has accelerated since 2003-2004;
- In October 2004, the Romanian economy become a functional market economy;
- The fiscal policy reform from 2005 stimulated FDI, making the economy more transparent;
- The European integration (1st Jan. 2007) brought new opportunities and challenges;
- The GDP per capita in Romania was 38.8 % of the EU-27 level in 2006 and 41.5% in 2008;
- The international financial crisis – new threat for Romanian economy.
Current status – R&D (1)

- The Romanian R&D system went across a very difficult period after 1989 because the underinvestment and delayed restructuring. The fragile enterprise sector in Romania could not exert a real innovation demand.

- Practically isolated, the R&D system was fragmented, as the various components tried to survive with the minimum available resources, mainly by public funding, within a formal and autarchic systems.

- The number of researchers decreased drastically from 1990 to 2005, due to the following factors:
  - delayed institutional reform,
  - low wages,
  - the absence of an evaluation system fostering and compensating the real performance,
  - the poor quality of the R&D infrastructure,
  - the absence of clarity and transparency concerning the professional career.
Employees from RDI include:
- personnel from the RDI activity that directly participates in RDI activity;
- personnel from the production activity (from departments in charge of industrial and agricultural production and micro-production);
- personnel performing activities ancillary to R&D.
In a wider context, the innovation culture is still low, both in the enterprise field and in the academic environment.

- The enterprise innovation level has not been consistently supported by an operational technology transfer system.
- On the other hand, there are several examples of large companies which opened research centers and developed high-tech services in Romania.

As regards the connection with the international environment, the technological lags in comparison with developed countries foster the technology import, not innovation.

- The lower cost of research activities in Romania might be a short-term advantage, but it creates an additional risk related to the “brain drain” in the globalization context.
- The high concentration of RDI institutes and enterprises in the main cities and the level of research in universities, are the determinants of the regional disparities in the absorption of the public R&D funds.
Current status – R&D (3)

- The modest results and the weak international cooperation capacity are reflected in the low number of articles and citation in main scientific publications and in the lack of interest towards the protection of intellectual property.

- Although the RDI system did not succeed to generate impressive examples in transferring research results into the social and economic field, it has managed to preserve or develop actors (universities, institutes, research teams) with a clear international visibility.

- The RDI expenses are much less than the EU average (1.84% in GDP):
  - R&D expenses: less than 0.4 % from GDP in the period 2000-2004;
  - The R&D expenses increased to 0.46% from GDP in 2006 and 0.54% from GDP in 2007;
  - In 2009, the R&D represent 0.24% from GDP.
Weight of RDI expenses in GDP-Romania
At present...

- A research area less fragmented than few years ago, more concerned of research projects;
- There is a FP7 program and other international programmes with Romanian participation;
- There was launched the second National Plan for Research and Innovation, more flexible than the previous one;
- In 2007 was started the process of evaluation and accreditation for the R&D institutions.
- Structural funds accession.

But...

- Despite the efforts, there was not realized a clear partnership with the business environment;
- There are not identified the funds spent for research, development and innovation in firms;
- There is a lack of publicity for the R&D results and there are not enough efforts done in that sense.
Responsible institutions for RDI(1)

- Ministry of Education, Research and Innovation (MECI) is the main institution in charge with designing, implementing and evaluation of RDI policy.

- National Authority for Scientific Research (ANCS) has as main objective the harmonization of national R&D and innovation policy with the EU trends and in particular, with the Lisbon Strategy. The ANCS is responsible for the elaboration of the National RDI Plan.

- National Scientific Research Council of Higher Education (CNCSIS) is a consultative body of the Ministry of Education which ensures the link with the Higher University Research Community in the process of allocation of R&D funds for universities and evaluation of research performance. CNCSIS and the Executive Agency for Higher Education and Research Funding coordinates the National RDI Strategy for the period 2007-2013.

- The Romanian Academy has a special role in taking strategic decisions, designing and implementation of R&D policies and national programs. The academy of science and the specialized agencies coordinates a network of 65 research institutes and centres.

- The Ministry of Communications and Information Society (MCIS) is invested with the authority for developing the strategic policy for the ICT sector.
Responsible institutions for RDI (2)

- Under the supervision of several Ministries, there are different categories of public research institutions:
  - National R&D Institutes in 15 research fields;
  - Academy of Medical Sciences: 23 institutes and research centres;
  - Academy of Agriculture and Forestry Sciences: 25 institutes/research centres;
  - National Agency for Atomic Energy; Romanian Space Agency;
  - Universities (56 public, 28 private universities).

- Concerning the regional and local level, the institution involved in the regional RTDI policy are the Regional Development Agency, the County and Local Council.
Financing sources for RDI in Romania

The total (capital and current) expenditure for the research-development activity is structured by financing source, as follows:

- **from public funds (state budget)** - used for financing the research-development works based on contracts and general programmes financed from the budget;

- **from economic units**, for performing research-development works based on contracts, irrespective of ownership type and activity field;

- **from higher education units**, intended for carrying out research-development works based on contracts;

- **from non-lucrative associations**, intended for performing research-development works contracted by professional organisations, trade-union associations, cultural ones, charity and mutual assistance organisations;

- **from other domestic funds**, whose financing source is represented by donations or any other unspecified source;

- **funds from abroad for research-development activities**, including sources received from international organizations, foreign governments or institutions.
## Financing sources for RDI – recent evolutions

<table>
<thead>
<tr>
<th>Year</th>
<th>State Budget</th>
<th>Private sources</th>
<th>FP6/FP7*</th>
<th>Structural funds*</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>0.21</td>
<td>0.16</td>
<td>0.01</td>
<td></td>
</tr>
<tr>
<td>2003</td>
<td>0.20</td>
<td>0.18</td>
<td>0.01</td>
<td></td>
</tr>
<tr>
<td>2004</td>
<td>0.21</td>
<td>0.19</td>
<td>0.01</td>
<td></td>
</tr>
<tr>
<td>2005</td>
<td>0.27</td>
<td>0.30</td>
<td>0.02</td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td>0.38</td>
<td>0.40</td>
<td>0.03</td>
<td></td>
</tr>
<tr>
<td>2007*</td>
<td>0.56</td>
<td>0.40</td>
<td>0.04</td>
<td>0.20</td>
</tr>
<tr>
<td>2008*</td>
<td>0.75</td>
<td>0.60</td>
<td>0.10</td>
<td>0.50</td>
</tr>
</tbody>
</table>

*) estimations  
Source: National Institute of Statistics
The main public R&D and innovation funds providers are:

- the Ministry of Education, Research and Innovation, through the National Agency for Scientific Research;
- the National Scientific Research Council of Higher Education (CNCSIS);
- in addition, the Romanian Academy finance research programmes in mainly in natural, exact and socio-humanistic sciences.
Main Novelties on legislative framework


The National Strategy for R&D and Innovation for 2007-2013 (1)

- **Strategic objectives:**

  - Promoting the creation and development of science and technology (S&T) knowledge, with a view on obtaining high level, internationally competitive, S&T results;

  - Increasing the competitiveness of the Romanian economy by promoting the diffusion and transfer of S&T knowledge, and the innovation processes with strong economic impact;

  - Increasing the quality of life through the development of S&T solutions with high benefits for society.
The National Strategy for R&D and Innovation for 2007-2013 (2)

- **Specific objectives:**
  - Promotion of research excellence;
  - Focusing public investment in RDI towards advanced research and lead technologies in key areas of application;
  - Increasing the RDI system capacity: reducing fragmentation, developing performant infrastructures, increasing the number of researchers, improving the management of RDI activities;
  - Stimulating private sector participation in RDI activities: development of public private S&T partnerships, technology platforms, S&T parks;
  - Increasing private sector expenditure for RDI to 1.5% of GDP till 2013;
  - Fiscal incentives and simplified access to RDI finance for innovative firms;
  - Extending international co-operation.
Priority RDI fields:

- ICT;
- Advanced technologies and innovative products, including new materials, bio- and eco-technologies, in industry, agriculture and food safety, health, energy, environment and transportation;
- Frontier sciences;
- Socio-economic research.
Supportive measures promoted by National Plan II include:

- *increasing the number of young researchers, of PhDs and post-doctoral graduates, and also of Romanian researchers from abroad reintegrated in R&D activities in Romania.*

- *developing in R&D institutions and in universities a working environment comparable to similar EU institutions, with high performance research equipment and ICT facilities, integrated into complex research platforms;*

- *promoting the European dimension of research in Romania, by improving the level and quality of participation of researchers to R&D programmes and activities in the European area.*
The National Plan for R&D and Innovation
2007-2013 (2)

Programme 1. Human Resources
Increasing the number of researchers and improving their professional performances

Programme 2. Capacities
Development of RDI infrastructures and their better connection and use at national and international level

Programme 3. Ideas
Generation of high level S&T results, contributing to a higher international visibility and recognition for Romanian research

Programme 4. Partnerships in priority RDI fields
Promotion of S&T partnerships leading to innovative technologies, products and services, for solving complex problems in key application areas

Programme 5. Innovation
Promotion of industry-led research, technological development and innovation, based on the absorption of research results, for improving economic competitiveness and the quality of life

Programme 6. Promoting institutional performance
Promoting the continuity and stability of R&D institutions, through the development of their own strategies, in accordance with the National RDI Strategy
A wide range of **28 indicators** are associated with the National Plan for RDI for 2007-2013, in order to monitor and evaluate the achievement of objectives during its implementation:

- The number of researchers and PhDs, and their participation in national and international projects;

- S&T productivity, including the number of publications, and of national and international (EPO, USTPO) patents;

- The level of investments in RDI infrastructures, including for S&T parks;

- The development of RDI activities in enterprises, in particular in SMEs, and their impact on increasing high technology production and exports.
## SWOT analysis – RDI system in Romania (1)

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relative strong industry, with fast growth rate</td>
<td>Reduction of RDI in industrial sector</td>
</tr>
<tr>
<td>Relative high level of ICT education, focused mainly on technical skills</td>
<td>Inadequate innovation culture</td>
</tr>
<tr>
<td>Strong tradition in RDI sector and a well established network of research institutes</td>
<td>RDI expenditure is far below the EU average (1.84% from GDP)</td>
</tr>
<tr>
<td>The existence of a National RDI strategy</td>
<td>Poor correlation between curricula and the needs of the industrial sector</td>
</tr>
<tr>
<td>Capitalization on the expertise acquired through participation to FPs</td>
<td>Weak linkages and integration within EU research network</td>
</tr>
<tr>
<td>Strength in computer theory and software engineering</td>
<td>Delays in the process to absorb EU funds and weak institutional support for participation in FPs</td>
</tr>
<tr>
<td>Universities are well distributed all over the country</td>
<td>Overlapping expertise, lack of specialization on the basis of local opportunities</td>
</tr>
</tbody>
</table>
### SWOT analysis – RDI system in Romania (2)

<table>
<thead>
<tr>
<th>Opportunities</th>
<th>Threats</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strengthen collaboration between industry and research</td>
<td>Low competitiveness and vulnerability of ICT industry on a global market</td>
</tr>
<tr>
<td>Identifying priority research topics for a better allocation of funds and increase of international competitiveness</td>
<td>Weak program monitoring and assessment, inefficient allocation of RDI funds</td>
</tr>
<tr>
<td>Restructuring the education system according to the market needs</td>
<td>Inherent inertia against structural changes that manifest in the education system</td>
</tr>
<tr>
<td>Correlation of RDI strategies with Romanian’s integration process in the EU</td>
<td>Conflicting relations between different RDI factors</td>
</tr>
<tr>
<td>Active participation and networking through FPs</td>
<td>Emigration of the best qualified researchers</td>
</tr>
<tr>
<td>With minimal supporting measures Romania could benefit from a large diaspora of high quality researchers</td>
<td>Discrepancies between wages in academic and industrial sector</td>
</tr>
<tr>
<td>Buid excellence on the basis of regiona/local settings</td>
<td>Local implication of local and regional authorities</td>
</tr>
</tbody>
</table>
From weakness to strength

- Improving the factor conditions
  - university R&D
  - telecommunications
  - technology parks
  - competitive national projects

- Improving the companies’ value chain
  - project management
  - quality assurance
  - marketing

- Improving the business environment value chain
  - legislation and enforcement of law
  - training facilities
  - integration of information systems
  - IT development entities
From threat to opportunity

- Networking
  - the industry
  - the domestic market
  - the foreign market

- Advocacy
  - support laws
  - support programmes for industry promotion
  - information and knowledge society

- Image
  - content development
  - ethical business content
  - corporate governance
  - best practice
  - branding
  - marketing & advertising
Romanian Regions
Business Incubators - Romania
Industrial Parks – regional distribution
Factors influencing innovation potential by type of region

<table>
<thead>
<tr>
<th>Region/type of region</th>
<th>Main factors influencing future innovation potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Leading Capital Region (Bucharest-</td>
<td>• Large concentration of public R&amp;D expenditure;</td>
</tr>
<tr>
<td>Ilfov Region)</td>
<td>• Qualified human capital, particularly in the ICT sector;</td>
</tr>
<tr>
<td></td>
<td>• The largest university centre in Romania in terms of student numbers;</td>
</tr>
<tr>
<td></td>
<td>• Better access to national R&amp;D funding;</td>
</tr>
<tr>
<td></td>
<td>• Large number of R&amp;D units covering a broad range fields;</td>
</tr>
<tr>
<td></td>
<td>• The highest level of SMEs per head in Romania;</td>
</tr>
<tr>
<td></td>
<td>• Strengths in the ICT sector;</td>
</tr>
<tr>
<td>The Leading Knowledge Regions (West</td>
<td>• Cluj-Napoca and Timisoara are leading university towns in Romania;</td>
</tr>
<tr>
<td>Region and North West Region)</td>
<td>• Qualified human capital, S&amp;E graduates, especially in the ICT sector;</td>
</tr>
<tr>
<td></td>
<td>• Lower level of R&amp;D public expenditure than Bucharest;</td>
</tr>
<tr>
<td></td>
<td>• Co-operation between foreign firms and universities;</td>
</tr>
<tr>
<td></td>
<td>• Lower access to national R&amp;D funding;</td>
</tr>
<tr>
<td></td>
<td>• Strengths in ICT, food industry, textile and solar energy sector;</td>
</tr>
<tr>
<td>The Industrial Region (Centre Region)</td>
<td>• Lower innovation potential of regional R&amp;D units;</td>
</tr>
<tr>
<td></td>
<td>• Industrial agglomeration and tradition;</td>
</tr>
<tr>
<td></td>
<td>• High level of FDI and industrial parks;</td>
</tr>
<tr>
<td></td>
<td>• Strengths in numerous industrial branches.</td>
</tr>
<tr>
<td>Lagging behind regions (South, South-</td>
<td>• Iasi has a university tradition but low level of SME development and the lowest SME per head indicator;</td>
</tr>
<tr>
<td>East, South-West and North-East)</td>
<td>• Large Areas of these regions are heavily dependent on agriculture;</td>
</tr>
<tr>
<td></td>
<td>• Strengths in chemistry sector, oil/energy, tourism, automotive (Renault factory) and heavy industry;</td>
</tr>
</tbody>
</table>