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What does Innovation mean? A brief introduction.

“Innovation is the process by means of which social and economic needs are met with new ideas and new products, services or business and organizational models are created; they are successfully introduced into existing markets or are capable of creating new markets”¹.

Innovation is understood as the process, while the novelty is understood as the result of this process (new product, new technology, new management, technological or organizational method). A. Jakubavicius (2008) describes innovation very laconically. Innovation is a functional, a progressive novelty, oriented to change from old to new. Innovation is formed while using various types of knowledge, striving to react to demands in the market or society (social demands).

Innovation can be defined as idea, practice or material product developed by humans. It is conceived as something new in the environment of its application. For this reason innovation can be perceived as strategic challenge to constantly generate new good ideas and transfer (convert) them to new products or services, which are needed in the market, for the organization, for the institution, for the city, the region or for the whole civil society.

In the recent years the term “innovation” is widely used as the term which describes a successful application, adaptation of new technologies, ideas or methods as well as modernization of the existing ones. Innovation is directly related to human activity. Innovative activity is understood as scientific, technological, projecting, application of new technological methods, implementation of new software, licences, know-how and etc. Innovative activity involves all stages: from the birth of the idea to the final result

Every definition of the term “innovation” opens new aspects of innovation and brings new understandings, supplements new approaches. The understanding of innovation should not be limited only to new products or services. It would be a too narrow approach to innovation. Very often new products are modernized, improved and developed, they are adapted to new demands, new markets, etc. Thus, new methods, new markets are also innovations.

Innovation is not an absolute novelty. Very often innovation is 99 per cents old and only 1 per cent new. In order to understand innovation better it is necessary to relate it to activity. Every activity has its aim, means and brings concrete results. Innovative activity is a directed formation and implementation of innovations.

¹ Lithuanian National Innovation Strategy for 2010-2020



In a broad sense, innovation in business is defined as towards risky changes oriented process during which knowledge in the environment are transferred to competitive products or services.

Innovations may be classified according to various characteristics. This approach allows to classifying innovations to product innovations, internal innovations, complex, radical innovations and etc. (Table 1)

Table 1. Classification of innovations according to various characteristics (adapted from <http://www.inovacijos.lt>)

| Characteristics | Innovations |
|--------------------------------|--|
| Content | Product, technological, social, complex |
| Level of implementation | Human, organization, sector, society, state, ecosystem, world-wide |
| Scale of implementation | Single, multiplex |
| Level of novelty | Radical, modifying |
| Organizational characteristics | Internal, trans/inter-organizational |
| Scope of implementation | Quantitative, qualitative |
| Final result | Fundamental, experimental, basic, difusive, conditional |
| Impact | Economical, social, ecological, complex |

Innovative activity may be described as a complex process, which involves the development, diffusion and application of the novelty. Besides, innovative activity is a dynamic system, the effectiveness of which mostly depends on the internal mechanism of the innovative activity and on its relation with the outer environment. Table 2 presents systemized differences between innovative and non-innovative activity according to specific criteria.

Table 2. Differences and criteria of innovative and non-innovative activity (adapted from <http://www.inovacijos.lt>)

| Innovative activity | Criteria | Non-innovative activity |
|-------------------------------------|--------------------------------|--|
| Development of new product, service | Direction of activity | Provision of the same product or service |
| Regular/continuous modernization | Orientation (aims) | Maintaining the same level |
| Cyclic, discretionary | Type of process | Continuous |
| Program-based, objective | Management | Operative |
| Temporary restricted | Group (team) interests | Rather permanent |
| Temporary increase | Costs | Rather permanent |
| Unavoidable, in balance to novelty | Risk | Minimal |
| Forecasted, unknown | Customers' reaction (feedback) | Permanent, known |



Internal mechanism of the innovative activity involves several phases:

1. birth of the idea/novelty;
2. development of the novelty and its initial implementation;
3. diffusion of the novelty application methods;
4. distribution of the novelty among users and customers;
5. operation and usage of the novelty
6. decay of the novelty.

In the internal mechanism of the innovative activity in a concrete organization (enterprise) every level of employees starting from managers, owners, specialists, technologists, financiers, etc. to simple workers plays certain roles and performs specific functions depending on their competences. Thus, every employee in the organization is/may be involved in different phases of the innovative activity (supporting, implementing, blocking, etc.) depending on individual attitudes and perceptions of the innovative activity. This may fasten or on the contrary, slow down the innovation processes in the organization. For this reason it is of primary importance for the managers to concentrate efforts to develop positive attitude of employees towards innovations.

Some conceptual definitions:

"Innovation refers to technologically **new** processes and products- either for the company, at local, country or global level- that have been **validated by the market**. The emphasis on the novelty means that it is not to make more of the same thing, but it includes to an important extent expanding the frontier of the human knowledge, it does not refer exclusively to it; as the new also has to be new for a particular company or for the country. On the other hand, the market validation involves that the innovation leads, in a shorter or longer term, to products or services that can be sold and have a visible price".

Escuela de Administración de Negocios, 2003 (Business Administration School, 2003)

"It is a performance improving the competitiveness of the companies and, therefore, their aptitude to evolve profitably in a market economy".

Fundación española (COTEC)(Spanish foundation)

"Innovation is the art of making ideas and knowledge become new or improved products, processes or services the market recognises and valorises."

Hamel, G. Liderando la Revolución. Ediciones Gestión 2000 S.A. Barcelona, 2000. (Hamel, G. Leading Revolution)

"An innovation is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations"

Definition proposed by the Organization for Economic Co-operation and Development (OECD) and European Commission (EC)

National Innovation System- in public and private sectors or other sectors.

Austria

The diversity of the research landscape in Austria correlates with the complexity of the organisation of research, technology and innovation policy. Political responsibility for the development of the innovation system is divided between several ministries, which manage their funding activities through agencies and research promotion funds. At the federal level, responsibility for research and technology policy as such is borne by three ministries, plus the Ministry of Finance, which has budgetary responsibility.

In recent years, Austria has rapidly closed the gap in research and technology policy, as, for example, the “Austrian council Presidency” underlines (see *R&D Innovation Information Service*, 2006). With its increasing deployment of resources, with structural reforms and new political initiatives, Austria is now in the position of keeping up with European innovation top performers as Finland or Sweden. This has been achieved by the tremendous input in Austrian research and development. Since the end of the 1990s, Austria has intensified its investment in R&D by 70%.

Concerning the Austrian innovation system, the private sector is as important as the public sector regarding R&D-expenditures. Within the public sector, national funds are predominant. The share of the provinces remained rather constant during the 1990s. Within the public sector the main institutions financing R&D are the universities. But this applies primarily to the national level. As far as Upper Styria, for example, is concerned, the importance of the universities is far lower whereas companies are more important.

Moreover, “the Austrian innovation support system is dominated by a few funding organizations, mainly offering direct support like grants and loans within the framework of several programs. The main institutions involved in innovation support are FWF, IFF, ITP, and ERP (all involved in funding, project evaluation and project administration). They either target on:

- basic research,
- applied R&D, or
- business and commercialization.

These big national technology and R&D support institutions still follow the linear innovation model. Each fund is responsible for a certain stage or phase in the innovation process. This ensures a clear-targeted investment in R&D activities



Hungary

In order to speed up economic growth in Hungary, the government is committed to the development and operation of a new, streamlined innovation system.

A comprehensive reform of the existing system began in 2003 and the institutional framework and related legislation has been profoundly transformed since. At the moment the system is under restructuring again.

Before the newest restructuring process started in the beginning of 2011 the innovation system looked like this:

The top government body for co-ordinating science, technology and innovation policies was the Science and Technology Policy Council (TTPK), while the Science and Technology Policy, Competitiveness Advisory Board facilitates the implementation of tasks defined by the TTPK. The Research and Technology Innovation Fund, also established in 2003, provided a stable and reliable financial environment for research, development and innovation activities². The Fund was managed by NKTH, the National Office for Research and Technology, which was responsible for implementing the government's science, technology and innovation policy. The essence of the government's R&D policy is defined in its medium-term Science, Technology and Innovation Strategy for the period 2007-2013 (adopted in March 2007). The general objective of the strategy is to drive the Hungarian economy through knowledge and innovation in the medium term, and to help Hungarian companies offer competitive products and services on the international market.

National Office for Research and Technology

The mission of the NKTH was to promote Hungarian R&D&I activities, as well as international projects involving Hungarian groups, and build on the country's reputation as an internationally renowned country for high-tech development. NIH plays a key role in elaborating and implementing Hungary's science, technology and innovation policies. Through the Research and Technology Innovation Fund NIH provides extensive support for the creation, dissemination and exploitation of new scientific research and technologies, promotes harmonised development of the national innovation system and fosters Hungarian participation in international science, technology and innovation networks³.

Newest restructuring of the innovation system:

The Hungarian government has restructured its research and development and innovation related activities into three separate organizations replacing the National Research and Technology Office eliminated on January 1. The main directions of research and development and innovation strategy will be formulated by a newly established National Research, Innovation and Scientific Policy Council.

The **National Economy Ministry** will overview the National Innovation Office, established through restructuring the former National Research and Technology Office to examine global innovation-trends. The new Office will serve as an agent linking enterprises with research both in Hungary and abroad and to attract innovation-connected investments and European Union-funded innovation projects to Hungary.

² ITD Hungary, 2009, p.5

³ *Ibid.*



The fund-management activities of the R+D and Innovation Fund will be transferred to the **National Development Ministry**, namely to the National Development Agency operating under the National Development Ministry.

According to the plans, the separation of tasks and the establishment of clearer spheres of authority among the organizations will increase the efficiency of the use of R+D and innovation resources.

Lithuania

According to The Innovation Union's performance Scoreboard for Research and Innovation (2011), Lithuania is one of the modest innovators. Strengths are observed in Human resources and Finance and support. Weaknesses are in Open, excellent and attractive research systems, Intellectual assets, Innovators and Outputs. High growth is observed for Public–private co-publications, PCT patent applications and Community trademarks. A strong decline is observed for Non-EU doctorate students and Community designs. Growth performance in Human resources and Intellectual assets is above average. In the other dimensions it is below average.

Innovation policy in Lithuania is formed and implemented by the state and self-government institutions (Seimas of the Republic of Lithuania, Government of the Republic of Lithuania, Ministries: mainly Ministry of Economy, Ministry of Education and Science, regional authorities and municipalities) through various laws, strategies and programmes. The main trends of innovation policy development are:

- Innovation culture promotion;
- The creation of innovation-friendly environment;
- Science orientation to the creation of innovation and it's implementation in business.

Innovation infrastructure consists of science institutions, innovation and business centres, science and technology parks, incubators, agencies, financial institutions, consultation companies and associative business organisations. The leading institutions are:

- Lithuanian Innovation Centre;
- Science and Technology Parks;
- Science Institutes;
- Universities;
- Lithuanian Economic Development Agency;
- Lithuanian Business support Agency;
- Banks.

The main goal of innovation infrastructure is to provide innovation support services to enterprises, research institutions, industry associations and business support organizations that are creating and implementing innovation policy. Innovation support services can be divided in the following groups:

- Information about technological development;
- Searching for partners;



- Searching for new technologies;
- Innovation projects' sponsorship;
- Technological consultations;
- Marketing services;
- Support to research;
- Patent and licence.

The main element of innovation system is the innovative enterprise. Innovative enterprise is an enterprise forming and implementing innovations. The main features of an innovative enterprise are:

- Orientation to changes;
- Permanent information channels;
- Team work;
- Decentralization;
- Risk;
- Bureaucracy and formality elimination;
- Initiative promotion.

Innovative enterprise does not only mean that this enterprise implemented new technology and applied new information in producing a new product, but the enterprise that keeps searching for possibilities and creates plans what should be done more in the future. In other words, the enterprise can't stand still, because the formation and implementation of innovation must be a permanent and dynamic process.

Innovation activity is developed in accordance with laws and normative acts of the Republic of Lithuania. The main acts are: the Law on Companies of the Republic of Lithuania, the Law on Joint-stock Companies of the Republic of Lithuania, the Law on Small and Medium-Size Business Development of the Republic of Lithuania, the Law on Legal Entities Corporate income tax of the Republic of Lithuania, the Law on Charity and Sponsorship of the Republic of Lithuania, the Law on Public Institutions of the Republic of Lithuania, the Law on Investments of the Republic of Lithuania, The Law on Value Added Tax of the Republic of Lithuania, the Law on Privatisation of State-Owned and Municipal Property, the Law on Copyright and Related Rights of the Republic of Lithuania.

Portugal

The main characteristics of the National Innovation System (NIS) in Portugal have remained largely unchanged. It includes a wide spectrum of players, due to a process of development of scientific and technological organisations, which has gained a stronger pace as a result of the successive Community Support Frameworks.

The range of Science and Technology players is wide, ranging from Universities and Public Laboratories, through Associated Laboratories and R&D Parks to Technological Infrastructures and Technological Centres. The most recent addition to these players is the Iberian International Nanotechnology Laboratory, a joint endeavour of Portugal and Spain.



In the financing field there are also a large number of actors, although the development of seed and venture capital remains weak. The key players in the NIS are, however, business firms. The Portuguese economic fabric is characterised by a very high share of SMEs. While a crust of high performing companies has developed, many SMEs still lack the in-house capabilities needed to achieve international competitiveness and to successfully focus on 'high-end' markets.

There is wide consensus that the chief weakness of the NIS in Portugal is the low density and depth of the linkages established among players in the system. For many years, the design of a cluster policy has been in the policy agenda as a key instrument to foster cooperation and linkages among the actors in the NIS. For one reason or another, only in the National Strategic Reference Framework 2007-13 (NSRF) has a cluster policy been established. It is expected that proper implementation of the cluster policy might play a very important role in responding to the above-mentioned weakness. This is an important opportunity, but entails simultaneously a serious policy challenge.

Portugal has improved its innovation performance, but has also enabled the identification of a number of challenges. These include the following:

- Strengthening human resources capabilities, particularly at undergraduate and graduate levels;
- Fostering the emergence and establishment of new companies, both domestic and foreign-owned, to promote employment, particularly in knowledge intensive activities;
- Strengthening of SMEs in-house capabilities;
- Transforming the cluster policy initiative into an effective opportunity for change and for increasing the systemic density of the NIS;
- Improving policy coordination, delivery and medium-term consistency.

Although competitiveness depends on a host of factors and not just on innovation performance, and because there is a time lag between such performance and competitiveness outcomes, it is likely that these achievements translate in increased economic performance in the future. However, medium-term forecasts in this regard are not optimistic. In fact, while the crisis has seriously undermined economic performance, the trend since 2000 has been extremely modest and the prospects for future growth are far from bright.

As the Portuguese economy aims for sustained growth and the ability to compete at the international level – objectives which are consistent with creating added value, regional qualification and more and better jobs – it faces a number of challenges and constraints. These, in turn, call for an aggressive strategy: such a strategy acknowledges competitiveness as a systemic reality and requires that the State play a dynamic and leadership role in creating business attitudes and behaviors that really value innovation and knowledge.



Spain

Comparing Spanish innovation system with those of the EU-27 and the OECD as a whole in 2007, Spain has increased its effort considerably in the last years and has gone forward quickly in the way of convergence with EU-27 and OECD, although its distance with the indicators of both spaces is still big, so ending an effective convergence requires the continuity of the present behaviours for a long period.

In 2007, the global effort in R&D (total internal expenses on R&D in GDP) in Spain (1.27%) was 0.5 percentage points lower than that of the EU-27 in the same year and a bit more than 1 point lower than the whole OECD. The effort on R&D in the Spanish companies was also lower in 2007 than in the average of the companies in the EU-27 and the OECD. The effort on R&D in the Spanish public sector is also below the one in the EU-27 and the OECD, although the differences are shorter. The distances, nevertheless, are being reduced in the context of the mentioned convergence process.

The distribution of the R&D expenses in Spain is still far from the patterns in the developed economies, where the expenses of the enterprise sector are close or higher than two thirds of the expenses on R&D. The Spanish enterprise expenses, in percentage of expenses on R&D compared with the total expenses (55.9%), are still 7.5 points below the average in the EU-27 and 13.7 compared with the OECD average.

Spain has a percentage of its population employed in R&D activities a bit lower than the EU-27 average. The percentage of researchers developing their activities in the enterprise sector in Spain (34.3%), in spite of having increased significantly in the last years, is still 11.6 points below the EU-27 average.

The moderate enterprise effort on R&D (only 6% of the expenses on R&D of the Spanish companies is allocated to contract projects generated in universities and public research organisations in our country)⁴ and the relatively low level of patents (we are one of the countries in our environment that registers the lower number of patents: five times less than Italy, 10 less than France or 30 times less than Germany) have negative influence on the rate of coverage of the balance of payments in the Spanish industrial sectors of high technology: the negative trade balance in these sectors has increased in 20.1 % from 2006 to 2007.

In short, the 2007 data show the sustainability of a convergence process of Spain with the EU and the OECD, still featured by severe distances: whilst the Spanish economy weight represented 9.5% of the GDP in the EU-27, its contribution to the R&D expenses was 6.8%, the weight of its human resources allocated to R&D was 8.5% and that of the triadic patents, only 1.6%.

In general, we can state that the innovation system in our country is not working as well as required to ensure the future development level and to generate the value required by the

⁴ According to CEOE data (\approx CBI)



present competitive environment. We need the critical mass, the human, technological and financial resources required and that the agents interrelate as effectively as possible to achieve the best optimisation and productivity of the whole.

To be able to progress in this direction, the companies should allocate more and better resources to renew their products and procedures to increase the percentage we represent in the country's innovative pie still depending, and within its limits, on the public sector. We should ask the public powers to support the creation of a new innovative enterprise network.

We should rely on the ability to create new innovative units, now in the Spanish university students' and Scientifics' minds, which, together with new facilities of the risk capital and the increasing of the mentoring and training work in the management techniques, to change the Spanish enterprise network the same way as our colleagues in the European Union are going to do.

A change in our productive model through innovation is considered as urgent. **INNOVATING, COOPERATING and EXPORTING** are the keys for the future.



Trainings on Innovation Management in the countries with regard to momentary economic needs.

According to Innobarometer (2009), in EU countries regarding the most sought-after *skills to support innovation*, general communication skills and a capacity for team working were the ones that most enterprises looked for (58% and 56%, respectively) when hiring or training their current employees. Creativity and negotiation skills were mentioned by less than half of enterprises surveyed (48% and 46%, respectively) and just under a third (32%) were specifically looking for the ability to communicate with people of other cultures. In terms of integrating *internal activities and systems* to support innovation, EU enterprises were most likely to say that they had introduced mechanisms to support the collection of innovative ideas from employees (46%), while 40% have used staff rotations and secondments to bring new perspectives to work processes.

International sources (<http://www.innovcom.info/>) summarize that competences associated with the concepts of Innovation and Knowledge Management are:

- Know how to augment the rate of continuous transfer and transformation of knowledge;
- Be able to translate learning into action;
- Know how to promote the interaction of knowledge among all company members;
- Know how to incorporate knowledge into the client's supply, processes and the system
- Be a leader of knowledge management;
- Know how to encourage creativity;
- Show availability towards innovation and lifelong learning;
- Know how to value Clients and Collaborators.

Summing up, the following competences for top and middle level management related to fostering of innovation in enterprises could be identified:

- Good communication skills in order to develop an effectively working team.
- Know how to augment the rate of continuous transfer and transformation of knowledge.
- Creativity and negotiation skills.
- Empathy skills to develop a positive psychological atmosphere in the enterprise and to avoid traditional thinking.
- Social reflection skills in order to understand the scope of the problem or to find points of interface integrating knowledge for problem solving.
- Entrepreneurship skills - ability to translate knowledge into action; risk taking.



Austria

Besides, in view of the fact that Austrian enterprises more and more recognize the importance of innovation management for economical success, the corresponding educational offers and pedagogical concepts have also developed in this direction. Especially at university and advanced technical colleges in Styria, the Southern part of Austria, the number of adequate trainings has clearly risen. This concerns undergraduate studies as well different postgraduate courses. Moreover, the number of innovative, very successful trainings in vocational training institutes has constantly risen from the end of the 1990s onwards. These trainings cover all sorts of fields, from very intensive technological trainings, for example in the metal industry, up to innovative communication and personality trainings.

Examples of outstanding concepts in the field of innovation management cover various fields as the following examples show:

- Institute of Innovation and Environmental management, University of Graz: <http://www.uni-graz.at/en/inmwww.htm>. The focus of this innovation management course is on the different steps of the innovation process (beginning from the methods of realizing arising problems leading up to a special focus on environment protection)
- Innovation and Process Management, MCI Center Innsbruck: http://www.mci.edu/com/degree_programmes/index.html. This program offers bachelor and master courses focusing on a practice-oriented approach, a strictly organized schedule and networking with universities from abroad in the areas of management, environment, and biotechnology.
- Innovation Management as joint venture, Technical University Vienna: http://cec.tuwien.ac.at/fileadmin/t/wbz/docs/cec/Stpl_ULG_E_I_09-05-2005.pdf. This postgraduate course is targeted at managers of companies involved in product development and product controlling
- Bachelorstudium Innovationsmanagement mit Schwerpunkt "Innovation & Engineering Graz, Austria: http://www.fachhochschulen.at/FH/Studium/Bachelorstudium_Innovationsmanagement_mit_Schwerpunkt_%22Innovation_&_Engineering%22_2605.htm
- University of applied sciences, Salzburg: <http://www.fh-salzburg.ac.at/bachelor/wirtschaft-tourismus/innovation-management-im-tourismus/beschreibung/>

Beside undergraduate and postgraduate courses at university, trainings on innovation management are offered in all Austrian counties which most of the time last for several days. These cover up the possibility to extend one's knowledge about special subject areas. Thus knowledge gaps concerning this subject can be filled straight. In the area of trainings, especially private suppliers and vocational training institutes are represented.



Looking at the thematic arrangement of educational offers, special attention is giving to the following contents with regard to momentary economic needs (especially within the scope of intensive trainings):

- Strategic innovation management
- Innovation policy and competitive policy
- Importance of Change management for the innovation achievement
- Possibilities for the stimulation of creativity and problem solution
- Creation and management of new products
- Marketing of innovations
- Basics of project management
- Basics of project-controlling
- Valuation of innovations
- Risk management

Hungary

The main institutions for providing innovation management courses are universities in Hungary. A few examples from the Central Hungarian Region can be found below:

Corvinus University of Budapest: Innovation management subjects are included in the Logistic management further education programme as well as in the other professional modules of the Department of Management and Organization.

Budapest University of Technology and Economics: several courses deal with the different aspects of innovation management and science management: Innovation management, Introduction to the politics of science and technology, Innovation management Ph.D and Science-Technology-Society Ph.D.

Eötvös Lóránd University: Innovation management is included in subject like Economics and management, Research and development in the medical industry.

Semmelweis University: in the framework of Ph.D courses the subject Introduction to innovation management in the field of health and life sciences is taught, as at the sixth year of the Health Services Management Training Centre such issues are covered in the course of Economics and legal issues of health care.

Besides universities there are a few organizations providing trainings on innovation management, partly in the form of e-learning, partly in traditional courses.

One of the oldest e-learning course in the field is provided by **INNOSTART** National Business and Innovation Centre together with the **Hungarian Innovation Association**. The e-learning course is three-month long and covers the field of basic financial issues in connection with innovation and management, the different up-to-date methods of innovation management and the field of financing innovation through proposals.

The **Talentis Innovation Centre** is also organizing an innovation management training programme in its Vocational Training Centre with the professional support of Budaörs ISC. Two courses are available at the moment: "Innovation management" in 40 hours and



“Organizational innovation management” in 800 hours in four semesters. The latter provides lexical as well as practical knowledge in the field, including field work.

Lithuania

The survey carried out in 2009 and presented in the report of the Innobarometer (2009), showed that on the EU level “training with the goal of supporting innovation was the second-most widespread investment that enterprises reported: 50% had such expenditure and 63% of these enterprises increased the amount spent when comparing 2008 to 2006”.

Various research as well as statistical information in Lithuania in the last years showed that most of the trainings on innovation were organized by enterprises and public sector institutions with the help of the European Structural funds. The areas, where demands of trainings were identified could be classified as follows:

- a) Training related to company management (this demand is characterized by the situation that in most enterprises no analytical work oriented to perspective market research, formation of enterprise development conception, strategic planning, distribution of functions in enterprise and etc. has not been regularly done.
- b) Training related to technological process management (production is not based on scientific and technological process; poor quality management; enterprises do not have long-term technological and production change conception, etc.).
- c) Training related to human resources management (this demand may be described by the situation that many of the top level managers are not able to make and implement constructive decisions needed for the stabilization of enterprise work in the economic crisis situation as well as how to ensure its effective functioning in the future; there is lack of the conception of human resources development, recruitment of personnel is based on the subjective criteria).

There is also other data provided by researchers on innovation and innovation development in enterprises (Zabelaviciene, 2009) with strong emphasis on the team work. According to I. Zabelaviciene (2009), teamwork in an innovation field is specific. It requires a large creative potential of a team. Therefore, a detailed staff analysis is necessary when such team is formed. One has to consider their compatibility in a professional competence area, way of thinking, tolerance of uncertainty, and level of moral development. In the innovation team, it is necessary to have individuals that have reached moral development principles level and foster creative values, which are not yet established in the organisation, regardless the opinion of the majority. Necessary conditions for teamwork development in innovation field are as follows:

- the senior management and shareholders have to understand the meaning of reconceptualisation and be psychologically ready to take actions fostering this process;
- most managers have to be ready to raise and defend new ideas;
- the management has to evaluate the situation in organisation divisions and dominating value system, and select a proper way of presentation of creativity as a value, which would be acceptable to the employees, and means to support it;



- the management has to create a feeling of contentment depending on the work results;
- management has to be improved when applying principles of transformational leadership.

Robbins (2003) state that the majority of managers cannot change themselves so they could manage/lead the teams/ Thus, they have to develop such knowledge, skills and competences as ability to patiently transfer information in enterprise; develop trust in employees; to know when managers have to interrupt the process and thus have to develop higher level of emotional intellect.

Portugal

FORMINOV: Integrated Training in innovation management and R&D valorization

Training. Innovation. Cooperation. Valorization. Four dynamics which when articulated in a sequence generate development. It is precisely in this sequence that FORMINOV was created - an aligned project with a logic that is to put scientific and technological innovation to the service of the community and of social development.

Through promotion and betting on training and critical mass qualification, the creation of strategies and comum projects, the sharing of organizational best-practices and the constitution of communication networks among partners, the FORMINOV project acknowledges the impact of opportunities sustained in a comum strategy of development to leverage the innovation potential of institutions and individuals.

In fact, the main objective of Forminov is to not only to add value to institutions directly involved, but also to:

- To promote the enhance of global competitiveness of the economy through the creation and/or development of entrepreneurial sectors based on innovation;
- To enhance the efficiency of connection between R&D infrastructures and the entrepreneurial tissue through a strategic approach on R&D activities.
- To dinamize a regional system of innovation in international excellence with strong market orientation, promoting interdisciplinility, collaborative work and networking with the main agents;
- To endogeneize competencies in areas such as innovation management;

The Forminov Project has come to an end, however being considered as a Best-practice in innovation management, we have decided to include this project in the National Innovation Report.

Training on Innovation Management

Several public and private educational institutions from the formal learning system offer training on innovation management. Some examples are shown below:

- IST - IN+ - Master of Science in Engeneering Policy and Management of Technology <http://in3.dem.ist.utl.pt/master/>. The programme aims at training qualified professionals and at promoting the creation and diffusion of knowledge on technology



policy and management of innovation. The ultimate goal is to contribute to the development of strategic leadership and high quality research abilities in students, as well as to the design and implementation of innovation policies promoting the role of engineering, science and technology and entrepreneurship in the sustainable development of society and the economy.

- IST - Departamento de Engenharia e Gestão - Mestrado em Inovação tecnológica e Gestão Industrial
<http://www.deg.ist.utl.pt/>
- Univ. Aveiro - DEGEI - Mestrado em Gestão de Ciência, Tecnologia e Inovação
<http://www.egi.ua.pt/cursos/mestrados.asp?mestrado=3>
- ISEG - Mestrado em Economia e Gestão de Ciência e Tecnologia e Inovação
<http://www.iseg.utl.pt/cursos/index.php?tipo=M&qual=36>
- Universidade Católica Portuguesa - FCEE - Programa Avançado de Empreendedorismo e Gestão da Inovação
<http://www.fcee.lisboa.ucp.pt/custom/template/fceetplgenpgmntp.asp?sspageid=70&lang=1&prod=4&curso=13>
- Universidade de Coimbra – Doctorate in Governance, Knowledge and Innovation
<https://woc.uc.pt/feuc/2modulecursos.do?idcurso=33>. The doctoral programme has the duration of four years (240 ECTS) and it offers two alternative paths, namely, the profiles of: “Knowledge and Innovation” and “Social Impacts of Science and Technology”. The first year comprises eight semestrial seminars, of 45 hours each; the first semester is devoted to issues of high conceptual and theoretical nature, to the introduction to themes, concepts and nuclear authors of each research area, essentially in an expositive basis; the second semester includes seminars that explore interactively the academic practices and training in each one of the areas initiated in the first semester. The access to the second year requires approval in the first year seminars. The second year of training is composed of one “Research Seminar on Economics and Sociology”, one “Seminar on Economics Methodology” or one “Seminar on Social Sciences Methodology” and one “Seminar for Update and Debate”. The thesis preparation starts in this year and can be lengthened to three years. The doctoral degree is obtained after the public defence of one thesis of about 80 000 to 100 000 words before a jury nominated in accordance with the University of Coimbra’s regulation on doctorates.
- Post Graduate Programmes in Innovation Management and Strategic Marketing and Innovation – EGPUBPS. Doing marketing today is not the same as it was during the 60’s and the 70’s. Customers are time-poor and information-rich; they expect better service, better quality, lower prices and more value for their effort and money. Competition has intensified and today we have products to satisfy almost all needs. Today customers are more than satisfied they are hypersatisfied. As it is happening with almost all the functions within the companies marketing is suffering a radical transformation. The strategic fundamentals of marketing (segmentation, targeting and positioning) are starting to show limitations as mechanisms for generating competitive advantages. Marketing needs new approaches and new ways of leading strategic thinking and strategic transformation within the companies. In this one day seminar we will explore new frameworks and methodologies to provide the participant with new ways of thinking and acting in this new context.
- Masters in Economy and Innovation Management – FEP



- Master in Innovation and Technological Entrepreneurship – FEUP. This programme promotes an integrated training of managers and entrepreneurs through a practical training (hands-on-approach). It is based on solid theoretical concepts and on a permanent and professional supervision, which enable the development of skills and knowledge in order to produce an efficient knowledge and innovation management in new businesses. These high potential new businesses may be developed in existing companies or by starting new companies.

Vocational Training

Inovamais provides top professionals from Portuguese companies (especially SMEs) with the necessary knowledge and practice for them to effectively manage projects in the field of innovation – (<http://www.inovamais.eu/engine.php?cat=187>)

Innovation Management – This course gives an overview of the following topics:

- **Innovative enterprises and innovation elements**
 - Description of innovation opportunities for the company: market, customers, human resources and internationalisation;
 - Identification of the planning stages of any innovation process.
- **Innovation process in enterprises**
 - Description of the different stages of the innovation process;
 - Risk assessment within the innovation process;
 - Financing for the planning of the innovation process.
- **Innovation implementation and management / support systems**
 - Innovation projects management, taking financial aspects, human capital and technological development into account;
 - Information systems to support project management.

Spain

In front of this change of paradigm, with an increasingly small world where new competitors appear, the only option is to compete for differentiation; compete for innovation. In this context, the managers should undertake a key role in the transformation of their organisations, while they must be conscious that to transform their organisation, they should also work on their own transformation.

For this reason, the first step is to develop new profiles (new competences) in the managers, who are going to boost this change and be key leaders to face successfully the challenge of innovation.

In front of this prevailing need, mainly the public institutions have started creating and distributing different materials to favour the necessary managing competences to face successfully the innovation processes in the organisations.



More concretely, in the Basque Country, there are the programs Lider21, Directiv@21 and 21Sarea, boosted by SPRI (Society for Industrial Promotion and Restructure):

- a) Lider21 is a training initiative addressed to intermediate managers in companies leading innovative projects. Its objective is to provide the team leaders with the necessary competences and tools to manage and lead the change in their people team, to implement successfully innovation projects in their work context.
- b) Directiv@21 is addressed to people in managing positions in companies to give them the necessary managing competences to face successfully the innovation processes in the organisations. More concretely, it offers training on the following:
 - Innovation management: train on the systemic approach to innovation.
 - Systemic strategy and innovation: principles and tools to define, develop and implement the innovation strategy in the companies, to allow generating, developing or keeping their competitive advantage.
 - Changing management through people: they are a key to increase the performance, motivation and participation of people in the companies and improve their qualification to lead efficacious and efficient teams.
- c) 21 Sarea is a meeting and cooperation space to favour exchange and generation of knowledge. It allows those belonging to the network to be a part of a knowledge community linked to the enterprise network, adapted to the manager profile, to generate experiences and reflections to help increasing the companies' competitiveness.

Other organisations, such as ESEUNE (Business School), also offer training materials addressed to managers and businessmen to understand and undertake the keys for change, to become familiar with the new frameworks (internal and external) of their companies, to understand the importance of people (their talent, their knowledge), the potential of technology (mainly the ITs) and the keys to generate value through innovation.



Different funding systems for science, technology and enterprises

Austria

2004 has gone down as a year of major structural reform in Austrian research funding. The establishment of the **Austrian Research Promotion Agency (FFG)** as a result of the merger of four funding and consulting institutions marked a break with the previous funding structures, which had been dominated since the 1960s by the two funding agencies FFF (Austrian Industrial Research Promotion Fund) and FWF (Austrian Science Fund). The steering structures of the FWF were also reformed, and the National Foundation for Research, Technology and Development was established as a new instrument of research financing.

The FFG has brought a greater degree of order into the funding landscape, which in the past has frequently been criticised for its complexity and fragmentation. This institution is also creating synergies by bundling the rich tradition of bottom-up funding with programmes that set thematic priorities and optimise the co-operation structures within the innovation system. It now concentrates a highly diversified funding portfolio under a single roof: from funding upon application to support for the networking activities of small and medium-sized companies, from the competence centres to the university spin-off programme AplusB, from thematic programmes such as the NANO Initiative or the Impulse programmes on sustainability or traffic technologies, to consulting services regarding participation in European and international research programmes and co-operations.

The FFG thus forms a triumvirate of research and technology promotion together with the Austrian Science Fund (FWF), and the **Austria Wirtschaftservice Gesellschaft (AWS)** founded two years earlier. The **FWF** is the biggest financier of basic research beside the universities, while the FFG focuses upon application-oriented research. This new clarity in research funding will become evident in June 2006 when the FFG and FWF move into the new House of Research together with the Christian Doppler Research Association and Austrian Cooperative Research. As the service centre for enterprise-related business promotion, the **AWS** is, among other things, responsible for the life sciences start-up programme LISA and the patent exploitation programme uni:invent.

The **National Foundation for Research, Technology and Development** was established as an instrument of sustainable research financing with a focus on supporting long-term, interdisciplinary research programmes. Since 2004 it has distributed EUR 25 million annually. The Foundation is financed from interest income from the capital of the **Austrian National Bank** and the **ERP Fund** dedicated for this purpose. (<http://www.era.gv.at/space/11442/directory/11822.html>)



Legislation and laws governing the system National Plan for R&D – “Forschungs- and Technologieförderungsgesetz” FTFG

The focus of this particular law, in short form called FTFG, is on the promotion and support of scientific research, also on the basis of sponsoring. The development measures can also convey adhering aspects and stages of development with regard to innovative research topics.

http://www.bmvit.gv.at/innovation/foerderungen/downloads/ffgg_18_8_2010.pdf
<http://www.bmvit.gv.at/innovation/foerderungen/foederungsrecht/fterichtlinien.html>

In particular, the law centers upon the objective of founding a fund, the so-called “Wissenschaftsfonds” which is however not concerned with yielding profits from research activity, but with disseminating and deepening the existing knowledge in various fields of research. Thus the fund places particular financial measures at the researchers’ disposal so that innovation in their research areas will be guaranteed

Besides, the fund is also responsible for yearly reporting on the situation of present research activities and on innovation management and thus giving relevant enterprises and universities in different fields the possibility to inform themselves about various research approaches in detail and in intensifying their networking activities with other organizations or institutions (<http://www.fwf.ac.at/>)

Hungary

National funding of science and innovation is mainly made from the **Research and Technology Innovation Fund** which will be managed by the National Development Agency operating under the National Development Ministry according to today’s plans. Apart from small enterprises, all companies must pay at least 0.25% of their turnover into the Fund. The central budget transfers an equivalent contribution into the Fund. The total budget of the Fund in the beginning of 2010 was HUF 44 billion.

The aim of the fund is to pump that public funding back into Hungarian economy by supporting research, development and innovation (R&D&I) activities primarily through its system of calls for proposals.

Another source (EU + domestic) of funding innovation is **The New Széchenyi Plan**, in the framework of which HUF 72 billion is allocated to the promotion of science and innovation in 2011, around HUF 200 billion is available by the end of 2013.

Big companies, mainly in the automotive, life sciences and software development sectors as well as ministries, universities and research centres are also active in the funding of innovation through calls for proposals and tenders.



Lithuania

Tax reduction to foster innovations. In order to promote private investment in R&D and innovation, the Seimas of the Republic of Lithuania passed Law of Amendments and Supplement to Law on Corporate Income Tax of the Republic of Lithuania, 2008, which enables enterprises to deduct their costs for R&D from income three times. It is also allowed to write off fixed assets used for activity of R&D to costs in a shorter period. Law of Amendments and Supplement to Law on Corporate Income Tax the Republic of Lithuania, 2008 provides that the enterprises, which invest in essential technological renewal, have the following reliefs of corporate income tax: such enterprises have a possibility to reduce their taxable profits up to 50 percent.

Networks. Integrated science, studies and business centers (valleys) were created in Vilnius, Kaunas and Klaipeda promote innovation development, implementing four programs of joint research, research development will be coordinated in particular sectors: natural resources and agriculture, biomedicine and biotechnologies, materials science and physical and chemical technologies and engineering and information technologies.

Science and technology parks. Science and technology parks are physical or virtual places where enterprises are established which perform applied research works and other innovation activities and render specialized value added services, such as business incubation, consultancy and technology transfer. The parks are mainly aimed to enhance the competitiveness of the region or a particular territory by promoting quality and innovation culture among their members, organizing knowledge and technology transfer from the place of their creation to companies and the market, and actively promoting the development of new innovative companies. In Lithuania today there is a network of 9 science and technology parks, which are spread over the whole of the country.

Innovation centres. Lithuanian Innovation centre provides public support for SMEs and other type of organizations, which are planning to develop and implement various types of innovations.

European innovation and business information centre. The network established with the EU support in the whole of Europe. In Lithuania EIBIC is coordinated by Kaunas Chamber of Commerce, Industry and Crafts and maintained together with partners in Vilnius CCI, Klaipeda CCI and the Lithuanian Innovations Centre. EIBIC provides information, feedback, business cooperation and internationalisation services; services for innovation and for the transfer of both technology and knowledge; services encouraging the participation of SMEs in the Community framework programme for RTD.

Financial instruments. Lithuanian private sector may use the support from the European Structural funds. Today there are 7 programmes supporting business in innovations development. Totally allocated around 436 mln. EUR (for the period 2007-2013).

Innovation cheques. One example of existing best practices is the regime of innovation-cheques in Lithuania. Its main goal is to allow SME's to purchase knowledge and strategic



consulting from research institutions through innovation-cheques (for an amount of 10 000 Litass) and thereby promote interaction and exchange between the producers of knowledge and SME's. The producer of knowledge can then hand in the innovation-cheque to the Ministry of Economy and receive payment. The rules regarding state aid allow support of that consultancy by public funds.

National support for patents. Financial support for physical and legal persons/entities, seeking to protect intellectual property rights by acquiring international patent. Financial support amounts to 100 percents of the patent costs. Financial engineering measures: risk capital funds (96,6 mln. Lt), credits (904 mln. Lt), individual guarantees (129 mln. Lt), business angels (27,6 mln. Lt), partial compensation of bank interests (104 mln. Lt).

Portugal

To challenge the international financial crisis' effects, whose depth and wideness became seriously worse in the last quarter of 2008, the Government approved the budgetary programme named **Initiative for Investment and Employment (IIE)**, which represents the national contribution in this anti-cyclical effort coordinated at a European level.

Public funding

Indirect support

1. To support the setting up of new businesses **Institute of Support to Small and Medium Enterprises and Innovation (IAPMEI)** created the **FINICIA** programme, which provides access to financing as well as help in obtaining risk capital or guaranteed credit.
2. The **SME Credit Lines Invest** aims to facilitate SMEs' access to bank credit, including interest rate subsidies and the reduction of the risk of banking transactions through the use of a guarantee facility of the **National Mutual Guarantee System** to cover up 50% of the outstanding capital.
3. The **SME Guarantee Programme** aims to strengthen SMEs credit insurance mechanisms by providing supporting at the level of guarantees, provided by the National Mutual Guarantee System, or directly by the state, allowing businesses to access instruments of credit insurance provided by national insurance companies on more favourable terms.

Direct support

1. The **Professional Job and Training Institute (IEFP)** has a programme to support **local employment initiatives**. New business owners can obtain two years of guaranteed financing for business operations. The IEFP also provides financing for contracting staff in professional training programmes, such as the programme to **stimulate job offers**. The **Business Gateway** provides information on mergers that might be entitled to **tax benefits**.
2. For international expansion, various financial instruments have been developed: the **AICEP** which offers **tax benefits** ; and the **Fund for international expansion of**



- Portuguese companies**, which was set up by the Portuguese government and financial institutions wishing to take part in expansion projects.
3. Under the **National Strategic Reference Framework (QREN)** a program called **SME Qualification- Incentive system for qualification and internationalisation of SMEs** was introduced to support various investment projects, including internationalization.
 4. Industrial research and/or pre-competition development are also supported by the **incentive system for business modernisation - R&TD**, which aims at boosting productivity and competitiveness.
 5. The **Foundation for Science and Technology (FCT)** manages the **grants programme** which finance investigation projects.
 6. Companies going through financial difficulties may get help from the IAPMEI programme **System of Incentives for the Revitalisation and Modernisation of Businesses (SIRME)** which tries to integrate these companies into larger structures.
 7. Businesses in the process of applying for insolvency may use **IAPMEI's out of court conciliation procedure (PEC)** to negotiate with creditors. An application letter needs to be submitted together with a five-year Business Plan.

Access to the EU Funding

Under the **National Strategic Reference Framework (QREN)**, incentive systems for business investment of the **Competitiveness Agenda** were relaxed by the introduction of measures which aim to respond to the current economic and financial crisis. Such measures attempt to boost European economic recovery and to adapt the terms and conditions of the QREN to support investment in exports and job creation. This legislation has increased the fees of incentives, within the applicable Community limits and established more favourable conditions for the progress of approved projects. The **System of Incentives for Innovation** by QREN is one of the fundamental public policies for economic stimulation, particularly in terms of promoting innovation and regional development. The management of incentive schemes involves cooperation between national and regional entities, distributed as follows: **National Management** (projects sponsored by medium and large companies) and **Regional Management** (projects promoted by micro and small businesses). The Specific Regulations for each of the incentive schemes are subject to the set of standards established in the guidelines of the **National environment for systems of incentives for innovation in businesses**. Bearing in mind the different stages of development and the degree of integration into the global market, three incentive schemes were created.

- a. The **System of Incentives for Research and Technological Development in Businesses** aims to intensify the national effort in R & D and create new knowledge in order to improve the competitiveness of enterprises, promoting the cooperation between these entities and the **Scientific and Technological Programme (SCT)**.
- b. The **System of Incentives for Innovation** aims to foster innovation in business, through the production of new goods, services and processes which aid them in moving up the value chain and strengthening its orientation towards international markets as well as the stimulation of qualified



entrepreneurship and structured investment in new areas with growth potential.

- c. The **Incentive Scheme for the Qualification and Internationalisation of SMEs** aims to promote the competitiveness of SMEs through increased productivity, flexibility and responsiveness and an active presence in the global market.

The funding provided in the incentive schemes will be boosted by additional instruments such as the **Collective Efficiency Strategies** either territory or sector based or the **Collective Actions**.

Private funding

A **Venture Capital Company** (SCR) is a form of financing business activity through equity, with a medium and long term time period, through the addition of a partner, usually a minority partner, committed to the success of the company, who will therefore, actively take part, and is dedicated to supporting companies with access to capital markets, with emphasis on SMEs.

A venture capital operation consists of acquiring a **minority stake** in the capital of a company, providing **financial support** for its development. The **aim** is the valuation the firm, so its participation can, in the medium/long term, be sold for a cost effective price.

Spain

The National Public Administration, conscious of its importance, has made many stimulating instruments and measures available for the companies:

- FONDO Tecnológico (Technological fund) (approved for 2007-2013)
- CDTI (increases its budget in 50%)
- ENISA (increase for 2010 of 45% of its budget)
- Taxing deductions (50% increase)
- ICO (assumes 100% of the risk of the loans)
- Regional incentives (80% of the budget available for the 2007-2013 period)
- ...and a long list of regional measures for the companies, among them:

Benefits PLAN AVANZA2

Plan Avanza2 is aimed at carrying out projects and performances in the framework of the Strategic Performance on Telecommunications and Information Society, within the National Plan of Scientific Research, Development and Technological Innovation 2008-2011.



Benefits for the program of scientific culture and innovation 2011

This program is aimed at financing activities meant to promote the scientific and innovative culture in the Spanish society.

NEOTEC initiative: support to the creation and consolidation of new technology-based companies in Spain.

The tools the initiative has will make the technological entrepreneurs' way easier from the moment of the idea conception until it becomes a feasible company.

Benefits to create and develop technology-based innovative companies 2011-2012.

The benefits are aimed at encouraging the creation and development of technology-based innovative companies in Asturias, in the framework of its plan for Science, Technology and Innovation in order to make the technological research and development projects become a business reality, able to be sold, providing technologic development and added value to the enterprise network in Asturias.

Benefits to industrial investment 2011

Calling in force until 11 March 2011, promoted by the Government of Cantabria to offer benefits for the support to consolidation and improvement of productivity and the development of new industrial activities.

Program of benefits for the incorporation of technological equipment and infrastructures 2011.

Its aim is the support to research, development and innovation of the enterprise network, through the supply of the necessary technological equipment for the development of more innovative and competitive activities, as well as for the creation and strengthening of enterprise R&D&I units.

Benefits to collective enterprise projects

The Instituto Gallego de Promoción Económica (IGAPE) has proceeded to call for 2011, in the DOG (Official Diary of Galicia) of 21 January 2011, the benefits to enterprise collective projects, co-financed by the European Social Fund, in the framework of the operational European Social Fund Program Galicia 2007-2013. The organisations without profit purpose whose activity is aimed at the enterprise world will be able to benefit from it

Strategic plan of subsidies of the Development Agency of La Rioja -ADER- for 2011

The Government of La Rioja has authorised the expenditure for the calling of subsidies of the Agencia de Desarrollo de La Rioja (Development Agency of La Rioja) (ADER) addressed



to Companies in La Rioja. This calling from ADER is framed in the Strategic Plan of Subsidies of the Development Agency for 2011 and will have a budget of 45 million euro.

Innoempresa program to support innovation in SMEs (2007-2013)

To subsidise, in competitive concurrence, regional projects developed in the Program to support innovation in the small and medium-sized companies.

Subprogram INNCORPORA (R&D&I National Plan).

Support and encourage the contract of highly qualified staff in the business sector to promote enterprise innovation

Municipal help within the initiative “Enterprise Development Platforms”

They are aimed at encouraging the development of Technology-based Innovative projects to consolidate the town enterprise network.

Experiences and best practices

| EXPERIENCE 1: Innovation-voucher SMEs (http://www.ffg.at/innovationsscheck) | |
|--|--|
| Aims | The innovation voucher is a support program for small and medium-sized companies in Austria with the aim of enabling them to enter into a continuous research and innovation. With the innovation voucher, the company can contact research institutions (non-university research institutions, universities of applied sciences), and can pay for required services up to a maximum of € 5.000, - with the cheque. SMEs are thus overcoming barriers to cooperation with research institutions. |
| Resources used | Support program SMEs, governmental funded |
| Outcomes | SMEs are thus overcoming barriers to cooperation with research institutions. |

| EXPERIENCE 2: Erfolgsteam - Förderung für MitarbeiterInnenbeteiligung (http://www.sfg.at/cms/2216/) | |
|--|---|
| Aims | Employee participation: Shared success instead of partial success. The most valuable asset in a company is probably the employees. To bind this capital to the company, wages and salaries are less and less adequate: a common perspective, Entrepreneurship in all departments and identification with the company and its objectives contribute deeply to our joint success. Whoever wants to engage its employees in the company's success is well advised with external consulting. |
| Resources used | Funded support program for SMEs Advice and guidance in this exploratory phase will be supported: - 75% support for max. 20,000 euros for external consulting costs for very small and small enterprises * = max. € 15,000 funding amount - 50% support for max. external consulting costs of 30,000 euros for medium-sized businesses * = max. € 15,000 funding amount. |
| Outcomes | Innovative production companies Innovative business services |



| EXPERIENCE 3: Pázmány Péter Programme – Regional Knowledge Centres(RKC) | |
|--|---|
| Aims | To establish professional and regional centres of excellence in cooperation with companies and other research organizations to manage innovative projects. |
| Resources used | Research and Technology Innovation Fund. |
| Outcomes | More than 15 knowledge centres provide great opportunities for academic researchers to meet market demand for innovation. Most research centres through their central university offer courses on innovation management for PhD students. Several innovative spin-off and start-up companies were created around the centres. |
| Problems found | Only academic courses on innovation management, providing lexical knowledge and sometimes management skills: IPR, patents, technology transfer, project management, etc. Innovation competencies are fostered by managers and learned instinctively by researchers, but no trainings in the field can be found. |

| EXPERIENCE 4: Cooperative Research Centres (KKK) | |
|---|---|
| Aims | Establishment of research centres and to support their operation, in which close relations could be developed between Hungarian higher education institutions, other non-profit research facilities and members of the corporate and business innovation sector, and in which the education, research development and knowledge and technology transfer can be integrated for strategic purposes. |
| Resources used | Research and Technology Innovation Fund. |
| Outcomes | KKK had a positive impact on the innovation activities of the member or associated companies, the number of PhD students and the quality of education and training by the member universities and the creation of new, technology based (spin-off) companies. 19 centres have been supported. |
| Problems found | Sustainability of the research centres is not ensured – they seem not to be able to finance their operating costs after the funding is over. |



| EXPERIENCE 5: Development of competences of innovative enterprises - members of Kaunas CCIC | |
|--|---|
| Aims | <p>The aim of the project is to develop competences of SMEs in order to adapt to changing situation in the market and to improve the quality of the work in enterprises.</p> <p>The objectives of the project:</p> <ol style="list-style-type: none"> 1. To upgrade qualification of enterprises' employees related to innovation development and implementation, which would increase their competitiveness 2. To increase number of enterprises involved in upgrading of qualifications of their employees. |
| Resources used | European Structural funds project. |
| Outcomes | <p>During the project the following training modules were developed:</p> <ol style="list-style-type: none"> 1. "The concept of innovation: management of risk in the innovative projects as well as financial possibilities for innovative projects". 2. „Strategic management of the innovative enterprise“. 3. „Management of innovative projects“ 4. „Team work in the innovative organisation“. 5. „Sales techniques of the innovative products“ 6. „Competitive environment of the innovative enterprise and managers actions in this environment“. Prognostic methods of the competitive environment“ 7. „How to develop initiative employees“ |
| Problems found | <p>During the project implementation period 3 levels of employees were distinguished: top managers, middle-level managers and other employees. Some of the training modules on innovations (for example, strategic management of the innovative enterprise, and others) for top managers and middle-level managers were very interesting for other employees but the project did not foresee such possibility (time and financial limitations).</p> |

| EXPERIENCE 6: To change the comfort conditions / modify the working situation and conditions | |
|---|--|
| Aims | To vary the scenario, resources, etc... of workers to see how they operate in other situations and face the new problems. |
| Resources used | Different scenarios (move to worker to other departments or headquarters) and diversity of tasks (that the worker performs new tasks or face different problems) |
| Outcomes | Workers more flexible, with more capacity to manage the change. |
| Problems found | Difficulties for the same company to be in possession of other areas, headquarters... where locate and rotate their workers. |



| EXPERIENCE 7: To be update of all the trends, news, etc | |
|--|--|
| Aims | To trace, identify and analyze new products, services, etc through the information obtained with the WEB2.0. tools. |
| Resources used | Workers through the ICT (WEB2.0) detect the innovation that can be arisen and see how they can be implemented in the company, and favor the relationships with professionals from other countries. |
| Outcomes | Workers informed of the latest trends that can be applicable in the organization. |

| EXPERIENCE 8: Places to learn and share (LACTS – Learn and collaborate to share) | |
|---|--|
| Aims | During one hour weekly workers meet together to share experiences (processes, jobs that are being carried out) to give the opinion among all and see if it is possible either to improve or offer more ad value to the customer. |
| Resources used | A large meeting room and a good and flexible working atmosphere. |
| Outcomes | New projects; improved offers, more competitive. People more committed to do different things. It is reinforced the valu of people. |
| Problems found | Not all the employees get involved. |

| EXPERIENCE 9: Team work simulations | |
|--|--|
| Aims | Establishing hypothetical cases (or based on reality) for a work-team to analyze and see possible solutions. 1.- To analyze the situation. 2.- Brain storming; each person suggests how to improve or have a positive impact in that process / product from his/ her job 3.- Conclusions; assessment of ideas |
| Resources used | |
| Outcomes | Improved processes, more competitive products. |

At least thirteen operational keys that have proved to be valuable have been globally identified, and therefore, they should be encouraged.

- The cooperation between companies and students/researchers can be fruitful in innovation activity
- Employee participation
- Innovation trainings should concentrate more on competence/skills development



- More open leadership
- Learning by doing
- Change management
- Open mind
- Promote the critical skills
- ALL THE IDEAS are good
- Ability to coordinate people
- Identify opportunities to connect/ combine the right people to generate excellent teams.
- Analysis: analyzing a problem is part of the solution
- IDEAS GENERATION: the process of creative production of new ideas

The importance given to innovation as a strategic value in each analysed experience, the generation of useful value for the market and society as the essential motor, the ability to make technology become practical and useful solutions for the process improvement and the existence of strict operational models managing, adapting and measuring the projects are some of the good practices identified.

The economical situation after the crisis referring to innovation. Labour Market –actual factors.

Austria

Labour market development in Austria up to 2013 – an overview

In the wake of the economic crisis, the Austrian economy contracted considerably in the first six months of 2009. Comprehensive economic stimulus packages of the public sector as well as a (minor) upswing of international trade have been reflected in a recovery since mid-2009. The economic trough seems to have been overcome but the economy is expected to grow only hesitantly in the next years. Austrian enterprises record a decline in demand, low levels of incoming orders and a decrease in cash flow during the forecast period. In addition, enterprises face tighter credit conditions. As a result, their willingness to invest is significantly reduced. Enterprises react to this deteriorated framework by adjusting their personnel levels. In the period 2009 to 2013, about 18,800 jobs will be lost.

Jobs are reduced most drastically (–60,500) in manufacturing, which is affected most severely by the global demand slump. However, the number of employees drops also in the sectors »miscellaneous economic services« (–20,000), »transport and warehousing« (–10,900) as well as in trade (–10,000). Most job opportunities are opening up in the health and social sector (+45,800).

In parallel to the decline in jobs, the number of persons registering as unemployed with the Public Employment Service increases. In the forecast period, the number of registered jobless persons will rise by 71,700. The largest increase (almost 70% of the total increase) has been recorded already in 2009. Unemployment figures are expected to drop not before 2012. (http://ams.at/ueber_ams/14172.html)

Hungary

Hungary has been in one of the most severe recessions among OECD countries, with the projected fall in real gross domestic product (GDP) in 2009 being double the OECD average. Hungary's economy suffered from a trade collapse just like other transition economies in the region, but the global crisis has been compounded by a collapse in investor confidence in forint denominated assets. This triggered a steep depreciation of the exchange rate in October 2008 and led the authorities to request financial assistance from international organisations. A combined credit package of EUR 20 billion was granted in November 2008 by the International Monetary Fund (IMF), the European Union (EU) and the World Bank.

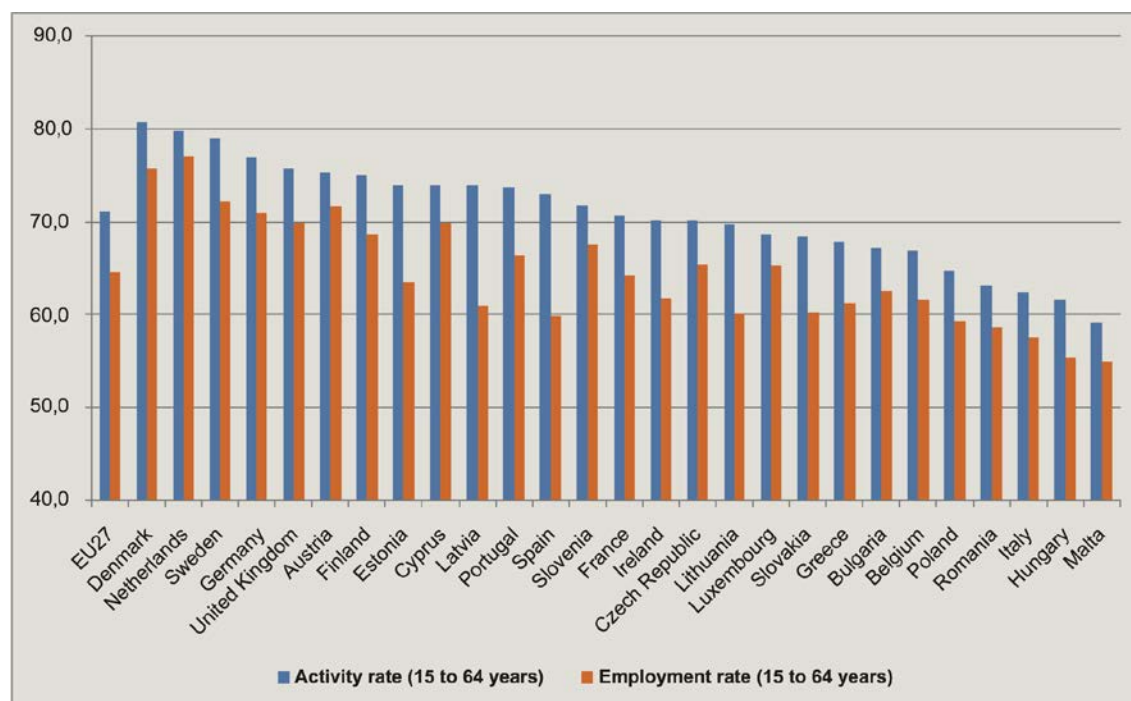
High foreign currency indebtedness and weak fiscal sustainability were at the root of the loss in confidence of foreign investors. Foreign exchange lending became a common practice due to the interaction of several factors, reinforcing each other. On the credit demand side, lenders were encouraged to borrow by the persistently wide spread between

interest rates in Hungary and western European countries, a relatively stable currency, and the expectation of convergence. On the credit supply side, banks favoured foreign currency lending owing to the lack of domestic forint savings and also over-optimistic assumption on convergence. As a result, households and enterprises have become increasingly indebted in foreign currency, especially in Swiss francs. Total external debt reached about 120% of GDP at the end of 2008, compared to less than 50% in Poland and 40% in the Czech Republic. At the climax of the financial crisis (October 2008), gross international reserves fell short of covering short-term foreign currency debt at remaining maturity. At the same time, the capacity of the government to bail out private investors appeared limited owing to the high public debt and the still significant fiscal deficit⁵.

Labour market

As a consequence of the economic crisis, the number of employed people was in Hungary significantly lower, while that of unemployed people considerably higher in 2009 than in the previous year when disadvantageous labour market trends characterized only the last quarter of the year. Though both the decrease of employment rate and the increase in unemployment rate was lower than the ones characteristic of the majority of EU member states, the relative labour market position of Hungary did not change essentially. In terms of employment rate, except Malta, Hungary took the last place among EU member states, while considering unemployment rate we could improve four places in ranking (19th place) of EU countries over the year⁶. In 2010, as the following figure shows, the employment rate of Hungary did not change.

Activity and employment rates in the EU, 2010



Source: New Széchenyi Plan

⁵ OECD. Policy Brief, 2010, p.3

⁶ Hungarian Central Statistical Office, 2010, pp.1-2



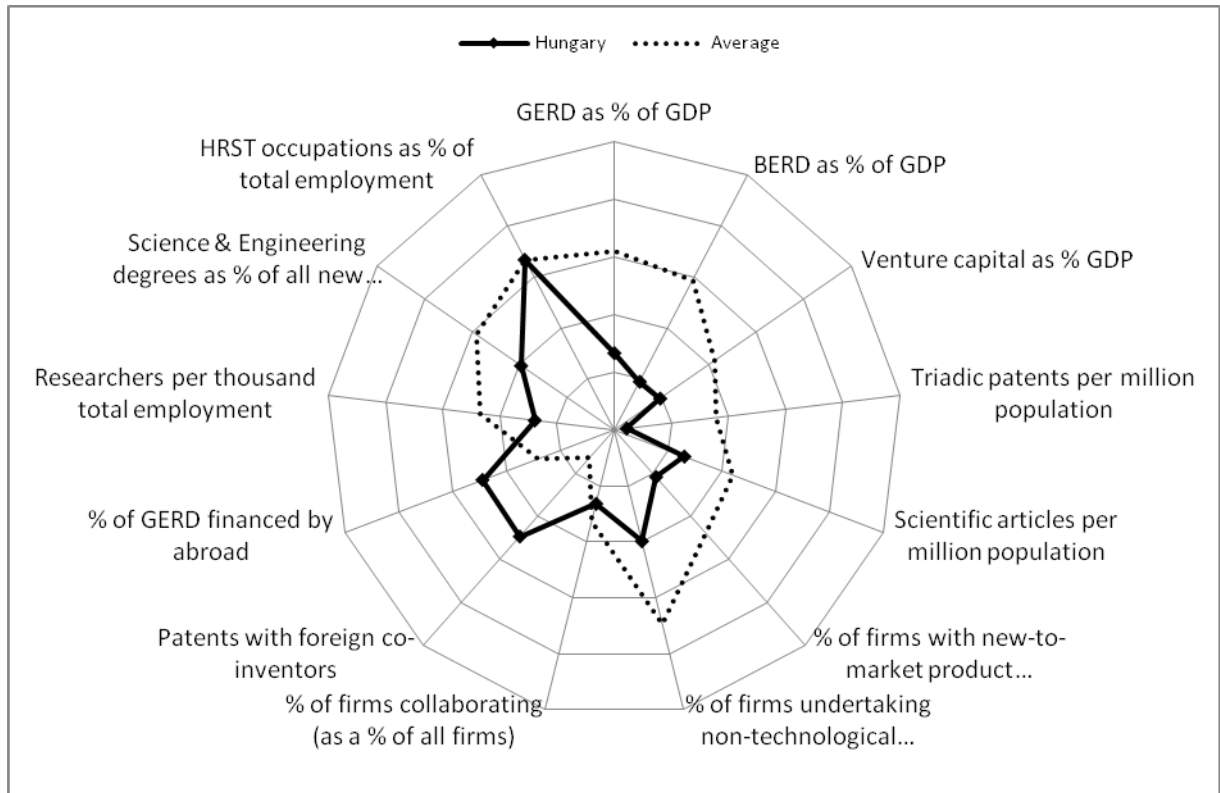
Science and innovation

Hungary's science and innovation profile has remained largely unchanged over the past two years, with some improvements, particularly in human resources in science and technology (HRST) indicators. For example, science and engineering degrees have increased to 14.1% of all new degrees, although this is still well below the average. Although the number of researchers per thousand employment remained below average at 4.5 in 2008, researchers grew at a robust compound annual rate of 4.7% between 1998 and 2008. HRST occupations increased to 28% of the total population in 2008, and more than 60% of HRST occupations were filled by women. Hungary's gross expenditure on R&D (GERD) was 1% of GDP in 2008, well below the OECD average. At USD 198 PPP, GERD per capita is also towards the lower end of the spectrum. However, in real terms, it has grown at a strong compound annual rate of 6.5% from 2000 to 2008. Industry financed 48% of GERD in 2008, and government financed 41%. More than 75% of government R&D funding is directed to SMEs.

Business expenditure on R&D (BERD) was 0.5% of GDP in 2008. After growing rapidly from 2004 to 2006, real BERD growth slowed significantly in 2007, before growing strongly again (9%) in 2008. Venture capital as a percentage of GDP was 0.05% in 2008. Hungary's innovation outcomes, while low, have showed some improvement. It had a below average 4.9 triadic patents per million population in 2008. Its 459 scientific articles per million population remains low, but moved closer to the average, growing by 2.6% a year in the ten years since 1998 to account for 0.3% of world output in 2008. During 2004-06, a comparatively small 6.2% of firms introduced new-to-market product innovations, and a low 27.6% of firms undertook nontechnological innovation. A comparatively high 9.3% of GERD was financed from abroad in 2008. In 2006, the share of manufacturing firms under foreign control exceeded 50%, while in the services sector foreign ownership exceeded 30%. While only 8% of firms collaborated on innovation during 2004-06, the share of patent applications with foreign coinventors (30%) during 2005-07 was well above average. Hungary has moved successfully to a market economy; its private sector accounts for more than 80% of GDP. The economy benefits from strong foreign direct investment inflows. GDP has grown by an average annual 3.2% since 2000, but contracted by 6.3% in 2009, when the unemployment rate increased to 10%. Labour productivity has been growing strongly since 2000. Per capita GDP is 42% relative to the United States. Innovation policy in Hungary is based on the government's STI Policy Strategy and Action Plan, approved in 2007, which aims to put the Hungarian economy on a new development path by 2013. The global recession and short-term economic ramifications have impeded the achievement of these targets. It is critical for Hungary to strike a balance between tackling shortterm tensions and addressing long-term issues⁷. (oecd hungary 2010)

⁷ OECD. Science, Technology and Industry Outlook 2010, 2010, p.182

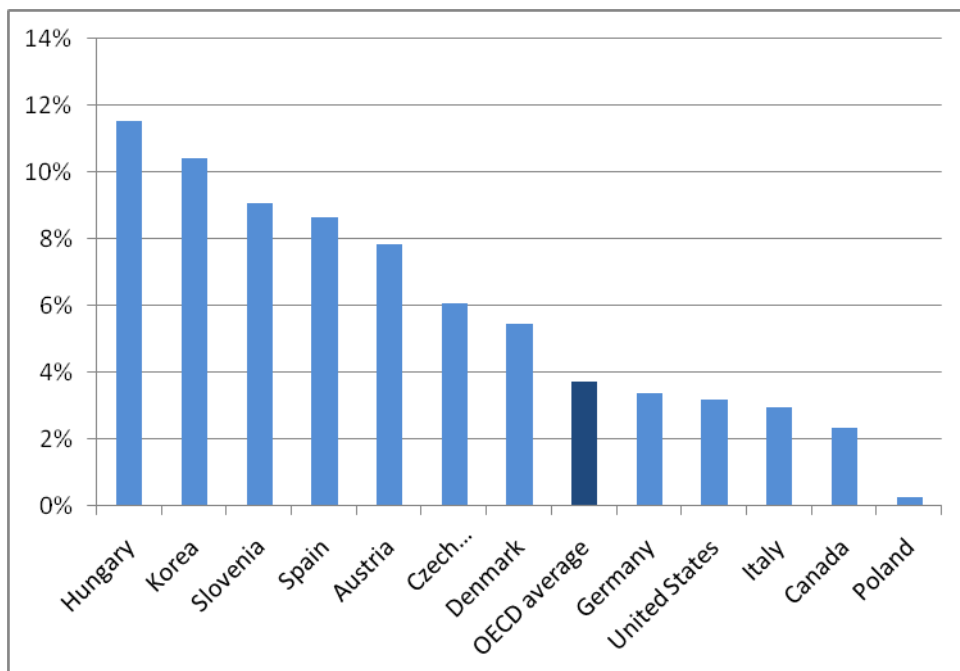
Science and innovation profile of Hungary



Source: OECD, StatLink: <http://dx.doi.org/10.1787/888932333861>

Growth of real business R&D

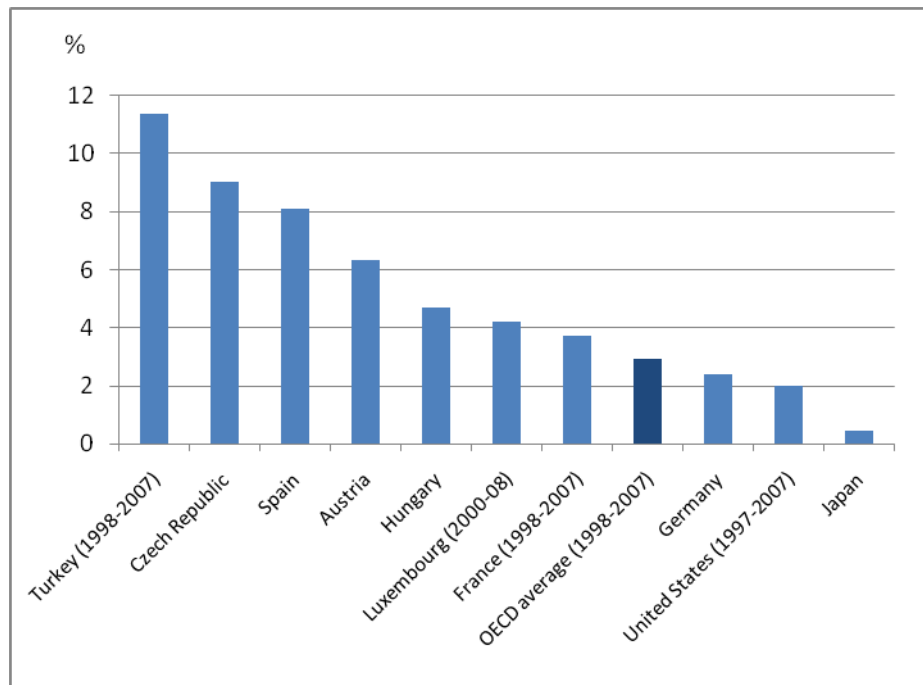
Compound annual growth rate, 1998-2008



Source: OECD, StatLink: <http://dx.doi.org/10.1787/888932333880>

Growth of researchers

Compound annual growth rate, 1998-2008



Source: OECD, StatLink: <http://dx.doi.org/10.1787/888932333899>

Lithuania

Based on the information from the Statistical Department of Lithuania, only 23,4% of all enterprises are innovative, however, 3/4 of the country enterprises have no innovative activity. The country economy still competes by costs but not by intellectual or innovative resources. Such situation shows that Lithuania lacks effective mechanisms and competences needed to create knowledge and to transfer the existing knowledge into innovations in business (Study "Strategic priorities and factors for **innovations** development in business").

Another tendency which is observed during the economic crisis situation is the increased emigration flows from Lithuania. Starting from 1990-till 2009 around 401 thousands inhabitants emigrated from Lithuania. Around 74 000 emigrated in 2010. Moreover, statistics of the last months (2011) shows that the unemployment rate remains quite high – 14,4 percents in January 2011.

Evaluating the scope of this problem, the current policy is oriented towards:

- More investments in LLL (using EU Structural funds, other programmes in order to increase enterprises investments into human resources development)



- More investments in increasing researchers in enterprises (special programme which support science –business cooperation, attracting researchers to work in enterprises, etc.)
- Attracting high skilled foreign labour force to Lithuania.

Portugal

The “European Innovation Scoreboard 2010”, released in Brussels by the European Commission, reveals that Portugal started to rise in the ranking of innovation, from the 16th to the 15th position in the context of the EU27. Compared with the 2007 edition, Portugal went up 7 positions in this European innovation ranking, positioning itself ahead of countries like Italy, Spain and Greece.

This improvement, resulting mainly from the impact of the Technological Plan, led to a growth rate in terms of innovation indicators well above the European average.

According to the report released today, Portugal has also been the European country:

- Presenting most progress on indicators of business expenditure on R &D;
- Presenting better results in the percentage of young people between 20 and 24 years having completed secondary education;
- Presenting better results in the percentage of innovative companies that collaborate with other companies.

Portugal still has the 3rd best performance in Europe in the number of new PhDs per 1000 population and percentage of innovative firms in the process or product. Portugal can therefore continue to climb in this ranking European innovation, despite the negative context of international crisis. And, extending the study to 34 European countries, Portugal ranks in 15th place.

| | 2006 | 2007 | 2008 | 2009 | 2010 |
|--|-----------------|-----------------|---------------------|---------------------|---------------------|
| Posicionamento de Portugal no contexto da UE27 | 22 ^º | 22 ^º | 17 ^º | 16 ^º | 15 ^º |
| Agrupamento de países a que pertence Portugal | “Catching-up” | “Catching-up” | Moderate Innovators | Moderate Innovators | Moderate Innovators |

Source: European Innovation Scoreboard 2010

Spain

In the last decades, Spanish economy has experienced a deep transformation in its productive structure. This has meant an important improvement of all the economic and social indicators. Thus, there has been an important increase of the average Spanish income: in the period 1997-2009, the per capita GDP went from 93.2% of the EU-27 average to 103% and compared with the Euro-zone countries, it increased from 82.48% to 94.65%.



Nevertheless, the international financial and economic crisis has influenced intensely the Spanish economy. Not only has the rhythm of growth been briskly interrupted, but there has also been a decrease in the last two years. The rate of unemployment has increased since the first three months of 2008 to more than double, going from 9.63% to 20.05% in the first three months of 2010⁸.

Regarding the data of the GDP evolution, the rate of growth, which was of 0.9% in 2008, became negative in 2009, -3.6%.

The R&D&I is one of the essential bases of sustainable economic growth. In this regard, encouraging research, development and innovation has been one of the outstanding elements in the evolution of the Spanish economy in the last years, according to data from the INE.

In the last decade, Spain has increased continuously the resources allocated to R&D, whose increase rate has been continuously higher than the GDP. This way, the effort on R&D (Expenses on R&D as a percentage of the GDP) has gone from 0.91% of the GDP in 2000 to 1.35% in 2008.

Regarding the results on research, the Spanish scientific production has increased quickly in the last years, going from 32,500 documents in 2003 to 52,238 in 2008 (according to data of the Web of Science), which means a 62% increase in this period. In 2008, the publications of the Spanish researchers are 3.13% of the world production.

The European Innovation Scoreboard offers a comparative evaluation of innovation in the 27 European Union member states. This comparison is made basing on a Synthetic Innovation Indicator (SII) got by the composed sum of 29 indicators. According to the results got in the EIS 2009, Spain is in the 17th position in the EU-27, very far from the position that would correspond to it in GDP or scientific production.

A detailed analysis of the base indicators that are used for the SII calculation shows that those which have the greater tractor effect on the results and in which there are the most important differences between the Spanish system and the EU-27 average are the private investment on R&D, the number of employments in medium and high technology sectors and the companies that make innovation:

- The private investment in R&D represents 0.74% of the GDP, compared with the 1.19% of the EU-27 average and 2.1% of the average of the innovation leader countries in the EU (Denmark, United Kingdom, Germany, Finland and Sweden).
- Employment in medium and high technology sectors represents 4.78% of the whole working population, compared with 6.69% of European average and 6.95% of the leaders.
- The number of small and medium-sized enterprises that innovate represents 24.6% of all the companies, compared with the 30% of European average and 42.45% of the leaders.

⁸ According to INE (National Statistic Institute) data



National Innovation strategy –How to increase investment in research and development

Austria

Structural Initiatives. Structural programmes and measures focus on eliminating existing barriers to innovation in Austria and on optimising the cooperation structures in the innovation system. The competence centres, for example, promote new forms of cooperation between industry and science. Other programmes are concerned with improving the networking capability of small and medium-sized innovators in particular, and with optimising the transfer of technology. Some programmes aim to improve the marketability and innovative capacity of companies - by helping set up innovative companies, expanding applied R&D expertise, and the intensified networking of companies, start-up centres, universities of applied sciences as well as university and non-university research institutions. The programme has a particular focus on small and medium-sized enterprises in their regional context. Knowledge must be translated into innovation more rapidly and effectively to strengthen Austria's innovative capacity as a whole.

SMEs and Innovation. These programmes aim at improving the marketability and innovative capacity of companies - by helping set up innovative companies, expanding applied R&D expertise, and the intensified networking of companies, start-up centres, universities of applied sciences, as well as university and non-university research institutions. The programme has a particular focus on **small and medium-sized enterprises** in their regional context. Knowledge must be translated into innovation more rapidly and effectively to strengthen Austria's innovative capacity as a whole.

Human Resources. In recent years Austria has also redressed its shortage of human resources in research and development. In 1998 the number of researchers per 1,000 gainfully employed persons was still considerably lower than the EU average at around 4.8. By 2002, this ratio had increased to 6.1, in line with the average figure in the EU. The number of those employed in R&D in the corporate sector (calculated as full-time equivalents) also rose sharply in this period from some 20,400 to approximately 26,700. This is the equivalent of an increase of 3 percent. Remarkably, this growth was recorded above all in the segment of highly qualified scientific personnel.

These developments are a testimonial to Austria's educational system in general. Compared internationally, however, the latter displays weaknesses as well as strengths. If, for example, one takes the educational level of the population as an indicator of the quality of a country's human resources, the proportion of university graduates in Austria at 5 percent (in 2003) is lower than the OECD average. However, this picture is distorted because it does not take into account the plethora of vocational training courses in the secondary sector in Austria. Furthermore, the mostly lengthy degree courses in Austria also depress the



percentage of university graduates. However, the introduction of Bachelor's degrees should soon lead to upward adjustments in this area.

In contrast, the school sector demonstrates a number of strengths. In Austria 79 percent of 25 to 64 year-olds hold qualifications attained after the statutory school-leaving age, i.e. a high school leaving certificate or apprenticeship. The average figure in the OECD is only 66 percent.

The output of the Austrian educational system will not, however, suffice alone to meet the demand. Greater inclusion of women in science and research is essential if these challenges are to be met. The percentage of women participating in research and development in Austria is still below the EU average.

Ultimately, the aim is also to transform the brain drain into a brain gain and brain circulation. (<http://www.era.gv.at/space/11442/directory/11871.html>)

Thematic Initiatives. Life sciences and biotechnology, the humanities and social sciences, nano-technology and, as a consequence, the material sciences, information and communications technologies, space and aviation, mobility, energy and environmental sustainability are areas in which traditional competences and new, emerging fields of Austrian research come together.

In order to make research successful in these key areas, the responsible federal ministries have over the past decade created comprehensive programmes extending over several years that possess critical mass. By providing the requisite agenda and financing for this type of research, the ministries are providing a framework within which it is possible not only to develop fundamental new insights and technologies across individual disciplines, but also to improve compatibility with European and international research. The process of focussing and concentrating funds has been given new impetus by the Austrian Council for Research and Technology Development.

In the life sciences these are programmes such as GEN-AU, the Austrian Genome Research Programme, or LISA, which supports high-tech start-ups in the life sciences. In the area of environmental and sustainability research, the programme proVISION focuses upon the thematic area "provision for nature and society". The priority programme GSK for example, or the NODE programme, which examines the process of European integration and the options and possibilities for the development of democracy, bring research in the humanities, social and cultural sciences to life by providing a wealth of new aspects. Materials research and materials sciences are important areas of research for Austria, and the Nano Initiative provides new incentives to implement the emerging thematic area of nano-technologies. Materials sciences also play a role in transport, space and aviation research. Programmes such as the Austrian Space Programme, A3, or TAKE-OFF have contributed to strengthening the relevant industries and clusters. The information technologies also make a contribution to traffic research through telematics. Other applications target the Internet economy, for example in the programme Digital Economy/ICT. FIT-IT on the other hand, funds work in areas such as Embedded Systems.



Strategic Intelligence. European Research Area means interaction of various measures (policy-mix). Monitoring and evaluating the implementation of these measures is important because it enables us to learn from success or failure as quickly as possible. ERA governance will therefore be complemented by a monitoring dimension that consists of policy-level surveillance on the one hand, and of strategic intelligence tools on the other.

Since this whole process is highly complex, it can only be governed by means of strategic intelligence, from Key Figures and an efficient reporting system to mutual learning and peer-review exercises that increase the overall competence of the responsible policy-makers.

This directory provides a broader, stimulating framework beyond the context of the European Union (e.g. links to OECD or national studies). (<http://www.era.gv.at/space/11442/directory/11643.html>)

Hungary

The government adopted its mid-term Science, Technology and Innovation (STI) strategy and Implementation Plan of the Government⁹ for the period between 2007-2013 on 28 March 2007, which was incorporated in Government Resolution 1023/2007.

Strategic Objectives

The general objective of the strategy is to make Hungary's economy driven by knowledge and innovation on the mid-term, and to ensure that Hungarian companies display competitive products and services on the international market.

Major goals defined in the strategy

The rate of company spending on R&D should reach 1.4% of the GDP, whereas government spending should not exceed 0.7%.

Internationally acclaimed R&D facilities and centres should be created. Quality and efficiency of non-profit research centres should improve and result exploitation and links to the business sector should be strengthened. Top ranking research universities should be established in Hungary which work in close cooperation with companies and react flexibly to the needs of the economy.

Hungarian small and medium sized enterprises (SMEs) must receive special treatment. Working out the government strategy for the innovative development of SMEs is one of the most urgent priorities. Government subsidy should not only be a form of capital but a factor in motivating innovation activities.

Principles of the Strategy

Principles of implementing strategic objectives

- Focusing of intellectual and financial resources, optimization of utilization.
- Increased economic and societal implementation of R&D results.

⁹ The Government's mid-term (2007-2013) science, technology and innovation policy (STI) strategy



- Strengthening of regional innovation.

Strategic Priorities

The following priorities are set forth by the strategy:

- Promoting the culture of exploitation and appreciation of scientific research results.
- Setting up a quality-, performance- and exploitation-driven, efficient national innovation system.
- Developing creative, innovative and appreciated workforce, complying with the demands of knowledge-based economy and society.
- Creating an economic and legal background that stimulates the generation and exploitation of knowledge.
- Promoting Hungarian enterprises, products and services which are competitive on the global market.

Implementation Plan of the Strategy

Operative objectives, detailed tasks and the phases of strategy implementation are included in the implementation plan of the STI strategy. The document, containing almost one hundred tasks, sets forth specific implementation programmes, the funds and phases thereof, the changes in the government's management structure, amendments to the legal framework of technology and innovation as well as the importance and role of STI policy in government activities.

Background of the Strategy

The STI strategy was compiled in accordance with the objectives of the National Concept of Development Policy (OFK), the National Action Plan (NAP) and the "New Hungary" National Development Plan (UMFT), it is based on a situation assessment.

The New Széchenyi Plan

As the National Innovation Strategy was also based on the New Hungary Development Plan, it is worth discussing briefly the continuation of the Development Plan – titled “The New Széchenyi Plan” - which was elaborated by the new government of Hungary by the beginning of 2011. The EU sources for the implementation of the New Széchenyi Plan are still the Structural Funds and Cohesion Fund (to which domestic sources are added).

The most important tasks of innovation policy according to the New Széchenyi Plan are the followings:

- The R&D and knowledge intensity of the Hungarian economy must be widely increased by supporting innovative companies with high growth potential operating in the processing and service sectors, increasing the innovation and absorption capacity of SMEs, developing innovative clusters and joining national and international knowledge sources and markets necessary for innovation.
- Hungary's fragmented knowledge infrastructures (research institutes, universities) must be strengthened and their competences must be improved in order to contribute



to the strategic realization of national economic goals substantially and in a measurable way¹⁰.

Lithuania

The vision of The National Innovations Strategy for 2010-2020 was formulated as follows: the basis of the Lithuanian economy is the production of high added value products and services; its competitiveness in the global market will be determined by environment favourable for innovative business; the system of education, science, research and development, interaction with business will help to educate a creative society and will create high-level knowledge base for novelties.

The objective of this strategy is to build a creative society and create the conditions for the development of entrepreneurship and innovation. Objectives and goals of innovation development are as follows:

- to accelerate Lithuania's integration into the global market ("Lithuania without borders");
- to strengthen knowledge base and develop integrated science, studies and business centers (valleys) of the international level;
- to participate actively in the creation of the European Research Area;
- to promote business networking and joining international innovation networks;
- to participate in the implementation of international initiatives (Strategy for the Baltic Sea Region, Knowledge and Innovation Communities created by European Institute of Innovation and Technology, activities of European Space Agency and others);
- to develop export of high added value products and services and business internationalisation;
- to promote foreign direct investment in high added value products and services;
- to educate a creative and innovative society;
- to create education and higher education system which promotes creativity and innovation;
- to promote entrepreneurship of education of various levels and private sectors; to promote life-long learning;
- to develop broad-based innovation:
 - promote technological, non-technological, social and public innovation;
 - to encourage enterprises, having considerable growth potential;
 - to promote innovation oriented towards demand and consumers' needs;
 - to increase access of small and medium-sized enterprises to various funding sources;
 - to establish conditions to commercialize research: to create necessary infrastructure (technology transfer centre) and legal mechanisms;
 - to develop effective mechanisms of business and science cooperation and schemes for support of joint business and science projects;
 - to implement a systematic approach to innovation;

¹⁰ Ministry for National Economy Hungary, 2010, p.55



- to ensure inter-institutional coordination when implementing the state innovation strategy;
- having reorganized research institutes, strengthen their cooperation with business;
- to strengthen interaction among science, studies and business;
- to establish Agency for Science, Innovation and Technology, the institutional structure, responsible for business and science cooperation;
- to ensure periodic (every two years) international assessment of Lithuanian innovation system and management reforms of public sector.

Since none of the states can be leading in all areas, it is important to choose economy sectors where Lithuania would be able to apply limited resources best and achieve the most optimal results. The most promising sectors in Lithuania should be chosen the ones that create high added value and have a critical mass of human potential of high qualification, development potential in the market and possibilities to increase productivity. Therefore, it is likely that the growth of the Lithuanian economy will be further determined by traditional industries in the future but their competitiveness in the global market will depend on whether business will perceive the importance of advanced technologies and will be able to use their possibilities.

High added value is also created by the following sectors of Lithuanian manufacturing industries, which are quite competitive in the international market:

- manufacture of food products and drinks,
- manufacture of wood and wood products,
- manufacture of furniture,
- manufacture of textiles
- manufacture of chemicals, chemical products and chemical fibre.

Advanced and medium-advanced technology industry should help traditional industry to become innovative industry of consumer products. Sectors of biotechnologies and laser technologies and industry of electricity and optical equipment have high potential in Lithuania. Sector of information and communication technologies is promising as well. Services of transport and logistics competitive in the international market, which have high development potential in innovation use, also create high added value. Lithuania should give especially much attention to the following new promising economy areas, which could determine the country's welfare in the future: clean technologies, future energetic, creative industry, welfare and wellness areas (pharmacy, medical and wellness services, medical and wellness equipment, technical and gear area, production of ecological agricultural and food products and other).

Portugal

The Technological Plan, launched in late 2005, provided a useful framework for the development of a more consistent innovation policy. Although having three main drivers (Knowledge, technology and Innovation), which defined a broad structure for action, the



coherence among many of the measures included in the Plan was limited. In fact, as pointed out above, the Plan addressed seven main areas:

- Networked society,
- Upgrading of human resources,
- Science & Technology infrastructure,
- Entrepreneurship,
- Financing system,
- Framework conditions for economic activity, and
- Company capabilities.

Assessing the strengths and weaknesses in the Portuguese innovation policy support system reveals that the present set of measures may generally be considered appropriate. This is intended to respond to both market and systemic (namely capability and network) failures.

Another important measure is the **National Strategic Reference Framework (NSRF)** which main strategic aim is the qualification of the Portuguese people through an emphasis on knowledge, science, technology and innovation, as well as the promotion of high and sustained levels of economic and socio-cultural development and territorial qualification within a framework of expanding equal opportunities and increasing the efficiency and quality of public institutions.

The achievement of this main strategic aim, which is indispensable for overcoming the most important constraints on the consolidation of sustained success in the process of economic, social and territorial development in Portugal, will be ensured via the concretisation by all the Operational Programmes during the 2007-2013 period, and with the support of the Structural Funds and the Cohesion Fund, of three major Thematic Operational Agendas, which encompass the three essential intervention areas of human potential, economic competitiveness factors and territorial enhancement:

- **Operational Agenda for Human Potential**, which brings together a set of interventions aimed at promoting school and professional qualifications among the Portuguese population and fostering employment and social inclusion, alongside the conditions for the valorisation of gender equality and full citizenship. The main areas of intervention of this Agenda are: initial qualifications, adaptability and lifelong learning, management and professional improvement, advanced competitiveness training, support for entrepreneurship and transition to working life, citizenship, inclusion and social development and the promotion of gender equality.
- **Operational Agenda for Competitiveness Factors**, which embraces measures that aim to stimulate the qualification of the productive fabric via innovation, technological development and stimulation of entrepreneurship, as well as the improvement of the various components of the business environment, with an emphasis on the reduction in public administrative costs. This Agenda encompasses, as its main areas of intervention, incentives for the production of knowledge and technological development, incentives for innovation and renewal of the business model and the pattern of specialization, financial engineering instruments for innovation funding and risk-sharing, integrated interventions to reduce public administrative costs, collective



business development actions, incentives for the development of the information society, supporting networks and infrastructure for regional competitiveness and integrated action for the economic valorisation of the least competitive territories.

- **Operational Agenda for Territorial Enhancement**, which, aiming at enhancing the attractiveness of the country and its regions and sub-regions with regard to investment and living conditions, embraces infrastructure measures and the provision of essential facilities for the qualification of the territories and the strengthening of economic, social and territorial cohesion. The main areas of intervention of this Agenda are: the strengthening of international connectivity, accessibilities and mobility, protection and valorisation of the environment, cities policy and also the networks of infrastructure and facilities aimed at territorial and social cohesion.

The concretisation of these three thematic agendas will be made operational, with regard to the guiding principles assumed by the NSRF - of concentration, selectivity, economic viability and financial sustainability, territorial cohesion and enhancement, and strategic management and monitoring. In line with the strategic and operational priorities, implementation of the NSRF and the respective Operational Programmes will be made possible by the availability of significant Community financing of around 21.5 billion euros.

Spain

The **National Innovation Strategy (E2I)** constitutes the performance framework of the Government policy in innovation to contribute to the change of productive model in Spain by the encouragement and the creation of structures favouring the better improvement of scientific knowledge and technological development.

Basing on the innovation situation diagnose in Spain, it determines and quantifies the objectives in the medium and long turn that will improve the innovative capacity of our economy.

The Spanish Government approved in December 2009 the **Strategy for Sustainable Economy**, based on the belief that it is necessary to accelerate the change of productive model, which includes a group of measures of economic policy, both with macroeconomic and microeconomic character, as well as some environmental and social aspects which configure a new environment for the development of innovative activities.

The Strategy incorporates a group of legal, regulatory and administrative initiatives aimed at being useful for a sustainable growth. It will be sustainable in three senses: *economic*, that is, increasingly solid, based on the competitiveness improvement, on innovation and on training; *environmental*, making the rational management of the natural resources become an opportunity to boost new activities and employments; and *social*, as a promoter ensuring the equality of opportunities and social cohesion.



Objectives of E2I.

The general objectives of the National Innovation Strategy are directly linked to the increase of a group of parameters until it goes higher than the present European average and comes closer to the innovation leaders.

In quantitative terms, this means the need of doubling the innovation economy in Spain, or in other words, to achieve:

- That in 2015 the yearly private investment in R&D is 6,000 euro more than in 2009
- That in the period 2010-2015 the number of companies making innovation doubles, incorporating 40,000 companies more.
- That the number of employments in medium and high technology increases in half a million in 2010-2015.

The National Innovation Strategy answers to the need to achieve these objectives in a five-year term, which is based on the starting situation and takes into account the present economic context, so that each process stage allows having a better base for the development of the following stages.

The National Innovation Strategy has five axes: generation of an environment favouring innovation, encouragement of innovation from public demand, international projection, strengthening the territorial cooperation and human capital. These axes are graphically represented in a space with pentagon shape. The knowledge transference is placed in its centre. The objective is to encourage and favour the knowledge transference and protection and to give value to it, by means of the establishment of measures supporting the creation and development of transference structures, excellence programs, the encouragement of public-private collaboration and the protection of the industrial copyrights.

The E2I is formulated with a multi-sector perspective, involving all the political, social and economic factors. Its strengths and opportunity lie on the ability to point the existing resources to a common objective, which is to favour innovation.

The National Innovation Strategy is, therefore, transverse to all the sectors and open to the participation of all the agents: General National Administration, through its different departments, Autonomous Communities, Local Administrations, Social Agents, Companies and Financial institutions to contribute to the achievement of its objectives.



Actual tags in the daily press to the need of innovation

Minister of research and technology, Mrs. Bures und FFG present a new SME -funding programme. 27.01.2011 - 10:27

http://www.bmvit.gv.at/en/innovation/humanresources/generation_innovation.html

Quick Start Programme successfully was completed-Now with a new SME-funding programme the quality of research- and innovation projects shall be increased

Vienna (OTS - 27/01/2011) - Small and Medium Enterprises (SMEs) play a central role in the Austrian economy. In order to facilitate their entry into a continuous research and innovation activity and to raise the quality of research projects, FFG and BMVIT are pooling in the SME package now a series of four funding programs of the FFG. Including the "Research Coach" for small businesses and the new "project start", with these programmes the preparation of research and development projects will be supported.

(People's Party) ÖVP-meeting in camera: The state as an economic engine 02.02.2011 | 18:20 | (Die Presse)

With a support package for small and medium-sized enterprises, the ÖVP will create up to 10,000 jobs. With government support, SMEs will be encouraged to invest in innovation, the vice chancellor said. The (existing) Innovation cheques shall be increased from 5000 to 10,000 €. New technology cheques should be created (1000 Cheques of 1000 €) in the volume of one million €. Starting in 2012, also shall be awarded so-called creative Cheques (1500 Cheques of 5000 €) worth of 1.5 million €

Technologie: Necessary is the pluckiness for risk. 27.08.2010

MARTIN KUGLER (Die Presse)

The long way from the idea to Innovation. Essentially therefore are „leadership“ and a culture which allows to take risk.

ALPBACH. A great Austrian has formulated this idea first: "One idea would only get innovated if it is successfully sold on the market, Joseph Schumpeter has written nearly 100 years ago.. And it needs "creative entrepreneurs" -. This paradigm is today more right than ever before.. "Where creative entrepreneurs are missing, there is a cessation of economic development, " said Reinhard Petschacher, CTO of Infineon Austria. He led at the Alpbach Technology Forum working group "From Idea to Innovation ".



Talentis Group to cooperate on creating "Silicon Valley" near Budapest. 2011-02-17

Hungary's National Development Ministry and the Talentis Group signed a declaration of intent on Thursday to establish a joint venture that will support the implementation of the Talentis Program, which aims to create "the first Central and Eastern European Silicon Valley" near Budapest.

Hungary govt restructures R+D and innovation supporting activities. 2011-01-31

The Hungarian government has restructured its research and development and innovation related activities into three separate organizations replacing the National Research and Technology Office eliminated on January 1, National Economy Ministry Strategic State Secretary Zoltan Csefalvay told MTI on Sunday.

R+D spending set to double under New Szechenyi Plan. 2011-01-17

Hungary's New Szechenyi Plan, a European Union-supported investment programme, aims to double spending on research and development as a percentage of GDP by the end of the decade.

New Szechenyi Plan to boost Hungary investment rate annual five percentage points. 2011-01-14

The HUF 7,000bn available under the New Szechenyi Plan in 2011-2014 is expected to boost Hungary's investment rate by an annual five percentage points, National Economy Ministry Gyorgy Matolcsy said on Friday.

Lithuanian science valleys – science and business are acting in cooperation, http://infobalt.lt/sl/index_en.php?t=sleniai

Nowadays, in Lithuania, there is being implemented an idea of 5 integrated scientific studios and business centers, so called the science valleys. This is the largest science-and-business project implemented in Lithuania upon its scale and financing. One of the most important aims of this project is related to intense cooperation between Lithuanian scientists and local and foreign companies, aimed at creating and developing of new technologies and products.

Innovation award 2009

<http://www.inovacijuprizas.lt/index.php?61185834>

Honoring the brave: despite the economic downturn, Lithuanian enterprises increasingly compete for one and only prize that honors the most innovative of them.

GATES: social and environmental business innovations

http://www.undp.lt/index.php?page=GATES&hl=en_US

The project aims to create necessary conditions for CSR practice enhancement in Lithuania and promote private sector engagement in practical implementation of CSR



principles with a view of contributing to competitive, safe and ecologically clean environment, social cohesion, transparent and ethical business practice. The Project is expected to disseminate credible CSR practices, encourage the use of social and environmental responsibility principles, contribute to effective and timely solution of social challenges brought by the economic crisis and adaptation to dynamic labour market conditions, increase corporate of companies for potential employees and to lay the fundamentals of social aspects in business.

Portugal Telecom wins European prize on innovation

http://www.jornaldenegocios.pt/home.php?template=SHOWNEWS_V2&id=467885

Portugal Telecom is a global telecommunications operator. It is the national leader in every sector where it operates. It is understood to be the Portuguese entity with the largest national and international projection. It has a diversified business portfolio in which quality and innovation are decisive aspects, alongside the most advanced international companies in this sector.

Principles of Open Innovation in Portuguese Companies

http://www.jornaldenegocios.pt/home.php?template=SHOWNEWS_V2&id=467149

The city of Porto receives investors and young technological companies

http://www.jornaldenegocios.pt/home.php?template=SHOWNEWS_V2&id=466437

Eurico Neves, CEO of Inovamais comments on the European Innovation Scoreboard 2010. http://www.dn.pt/inicio/opiniao/interior.aspx?content_id=1766467&seccao=Convidados

Eurico Neves - Innovation National Funding must be directioned to companies that present growing potential. http://economia.publico.pt/Entrevistas/Detalhe/apoios-a-inovacao-devem-ser-para-empresas-com-potencial-de-crescimento_1478927

The award “Ciudad de la Ciencia y la Innovación” (Science and Innovation City) recognises its 30 first municipalities. (20 December 2010)

- Science and innovation recognises the important effort and commitment of these cities with R&D&I
- For three years, they will be a part of the network Impulso, and will have some benefits in the framework of the R&D&I policies.

Bajo mínimos (At rock bottom). 03/01/2011 - News EFE

According to the data published by the Instituto Nacional de Estadística (INE) (National Statistics Institute), in 2009, Galicia decreased the percentage of the expenditure in innovation and development (R&D) of the Gross Domestic Product from 1.04% to 0.96%, thus placing on the 12th post of the autonomous communities.

Valencia, 2 Jan. (EFE).- The Consell has planned to start the Agencia Valenciana del Emprendedor (Entrepreneur Agency in Valencia) in the first months of 2011 to encourage the “culture of entrepreneurship in the young people in the Community”- stated the first vice-president and conseller of Industry, Commerce and Innovation, Vicente Rambla.



The presentation of candidatures to the best innovative initiative in Extremadura on renewable energies extends until February. MÉRIDA, 2 Jan. (EUROPA PRESS) -

The deadline to present the candidatures to the "Best Innovative Initiative in Extremadura on Renewable Energies 2010" has been extended to 15 February 2011. This award is aimed at encouraging the region business spirit, encouraging the generation of innovative ideas and projects in the sector of renewable energies, apart from promoting a "highly competitive business network sensitised with the suitable environmental practices" .

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- A word cloud visualization of research topics related to innovation and economic systems. The central and largest word is "Innovation". Other prominent words include "development", "policy", "technology", "economic systems", "research", "national", "importance", "introduction", "strategic", "management", "differs", "well", "difficult", "country", "marked", "1990s", "policy", "headlines", "difficult", "country", "marked", "1990s". The words are arranged in a circular pattern around the central "Innovation" word, with varying sizes and colors (shades of brown, tan, and grey) indicating their frequency or importance.